

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Steel Structures**

Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.
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- 4) Assume suitable data if necessary and mention it clearly before the Solution.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

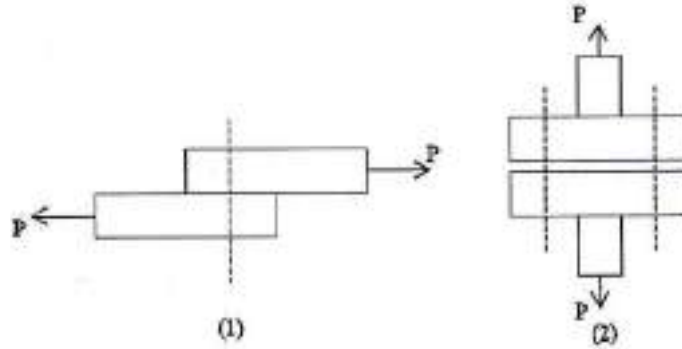
Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Load on connection is not eccentric for \_\_\_\_\_.
  - a) Lap Joint
  - b) Single-cover butt joint
  - c) Double-cover butt joint
  - d) Any of the joints mentioned above
- 2) If the same number of bolts has been used in the joints, then which of the following will yield highest efficiency \_\_\_\_\_.
  - a) chain
  - b) Diamond
  - c) Staggered
  - d) staggered diamond
- 3) If the diameter of a bolt is 20 mm, then the maximum number of bolts(s) that can be accommodated in one row in a 140 mm wide flat is (are) \_\_\_\_\_.
  - a) 2
  - b) 3
  - c) 6
  - d) 1
- 4) For a single unequal angle tie member, the leg preferred for making connection is the \_\_\_\_\_.
  - a) Longer one
  - b) Shorter one
  - c) Any of the two
  - d) Longer if bolted and shorter if welded
- 5) Minimum number of battens required in a built up column are \_\_\_\_\_.
  - a) 2
  - b) 3
  - c) 4
  - d) 6

6) In figure shown below



- a) Both 1 and 2 are shear connections
  - b) Both 1 and 2 are tension connections
  - c) 1 is shear connection and 2 is a tension connection
  - d) 1 is tension connection and 2 is a shear connection
- 7) The slenderness ratio of a lacing member should not be greater than \_\_\_\_.
- a) 180
  - b) 150
  - c) 145
  - d) 165
- 8) The shape factor for triangular section is \_\_\_\_.
- a) 1.50
  - b) 1.14
  - c) 2.34
  - d) 1.78
- 9) For welded plate girder, the  $b/t_f$  and  $d/t_w$  ratios are respectively 6.7 and 91. The section of the plate girder will be classified as \_\_\_\_.
- a) Plastic
  - b) Compact
  - c) Semi-compact
  - d) Slender
- 10) The net tensile strength of plate per pitch is 63.76 kN and strength of solid plate per pitch length is 106.27 kN then the efficiency of the joint is \_\_\_\_.
- a) 59.99%
  - b) 16.67%
  - c) 166.67%
  - d) 95.99%
- 11) A beam section is classified as low shear case when the factored shear force is less than
- a)  $0.4V_d$
  - b)  $0.6V_d$
  - c)  $0.8V_d$
  - d)  $V_d$
- 12) The partial safety factors for dead load and live load for a roof truss for limit state of serviceability are respectively \_\_\_\_.
- a) and 1.5
  - b) 1.2 and 1.0
  - c) 1.0 and 1.0
  - d) 1.2 and 1.5
- 13) If the number of possible plastic hinges are 4 and the degree of indeterminacy of the structure is 2 then the number of possible independent mechanism (n) will be \_\_\_\_.
- a) 6
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- 14) A frame has an indeterminacy of 2 and the numbers of possible plastic hinges are 3. The collapse will be
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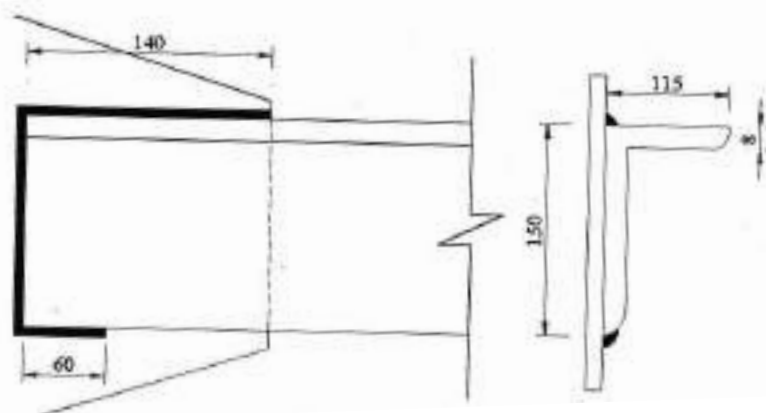
Day & Date: Wednesday, 25-01-2023  
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Max. Marks: 56

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**Section – I**

- Q.2 a)** Explain plastic section, compact section, semi-compact section, slender section **05**
- b)** The loads on a floor beam of a commercial building are as below: **05**  
 Dead load:  $6 \text{ kN/m}^2$   
 Live load:  $4 \text{ kN/m}^2$   
 Roof finish :  $1.5 \text{ kN/m}^2$   
 Determine the design load for limit state of strength and limit state of serviceability.
- Q.3 a)** Compute the tensile strength of an angle section ISA 150 x 115 x 8 mm of Fe 410 grade of steel connected with the gusset plate as shown in fig. **05**  
 below for the following cases  
 i) Gross section yielding  
 ii) Net section Rupture



- b)** Calculate the value of the least radius of gyration for compound column consisting of ISHB 250@536.6 N/m with one cover plate 300 mm x 20 mm on each flange. **04**

- Q.4** Design a double angle discontinuous strut to carry factored load of 135kN resulting from the combination with wind load. The length of the strut is 3.0 m between intersections. The angles are placed back-to-back (with long leg connected) and are tack bolted. Use steel of grade Fe 410. **09**
- a) Angles are placed on opposite sides of 12 mm gusset plate.  
b) Angles are placed on same side of 12 mm gusset plate.
- Q.5** Design the built up column 9 m long to carry factored axial compressive load of 1100 kN. The column is restrained in position but not in direction at both the ends. Design the column with connecting system as battens with bolted connections. Use two channel sections back-to-back. Use steel of grade Fe 410 **09**

**Section - II**

- Q.6** Find the shape factor for following sections. **10**
- a) Square of side 'a' with its diagonal parallel to zz-axis  
b) Triangular section
- Q.7** Design a laterally unsupported beam for the following data **09**
- Effective span = 4 m  
Maximum bending moment = 550 kN-m  
Maximum shear force = 200 kN  
Steel of grade Fe 410
- Q.8** Design an I section purlin for an industrial building situated in the outskirts of Allahabad, to support a galvanized corrugated iron sheet roof for the following data: **09**
- Roof cover = Galvanised corrugated (GC) sheeting (130 N/m<sup>2</sup>)  
Spacing of trusses = 6m  
Span of truss = 15 m  
Spacing of purlins = 1.5m  
Inclination of main rafter to horizontal = 30°  
Weight of GI sheets = 30 N/m<sup>2</sup>  
Wind load = 2.0kN/m<sup>2</sup>
- Q.9** A column ISHB 350 @ 661.2 N/m carries an axial compressive factored load of 1700 kN. Design a suitable bolted gusset base. The base rests on M20 grade concrete pedestal. Use 24 mm diameter bolts of grade 4.6 for making the connection. **09**

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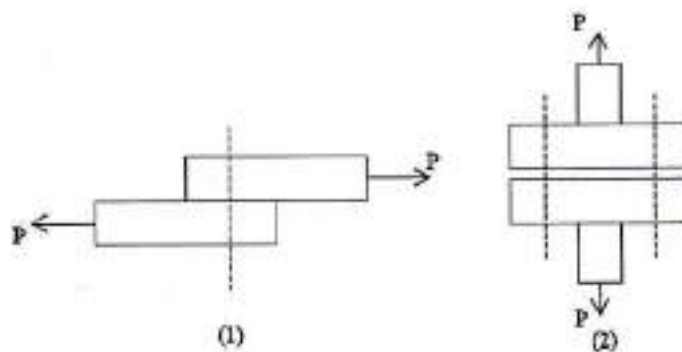
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## Marks:14

14

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- 6) If the number of possible plastic hinges are 4 and the degree of indeterminacy of the structure is 2 then the number of possible independent mechanism (n) will be \_\_\_\_\_.  
a) 6    b) 4  
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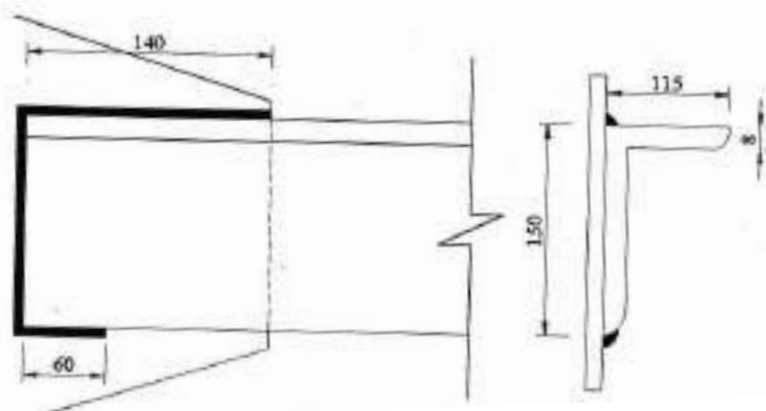
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**Section - II**

- Q.6** Find the shape factor for following sections. **10**
- a) Square of side 'a' with its diagonal parallel to zz-axis  
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- Effective span = 4 m  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

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**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A beam section is classified as low shear case when the factored shear force is less than
 

a) $0.4V_d$	b) $0.6V_d$
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Set **R**

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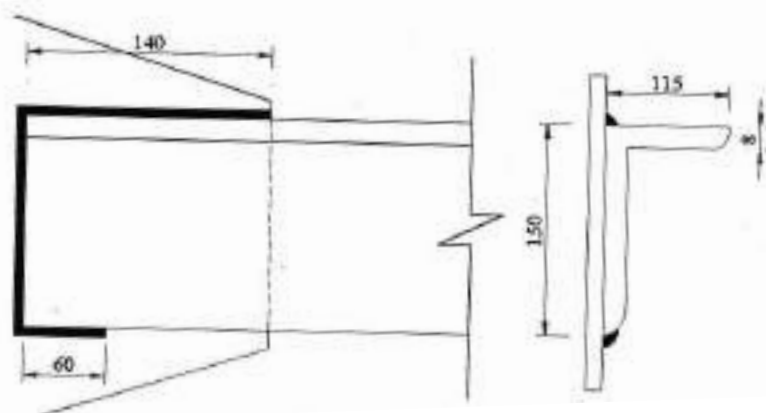
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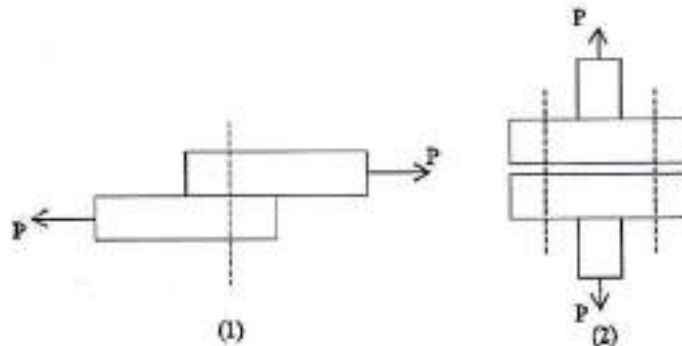
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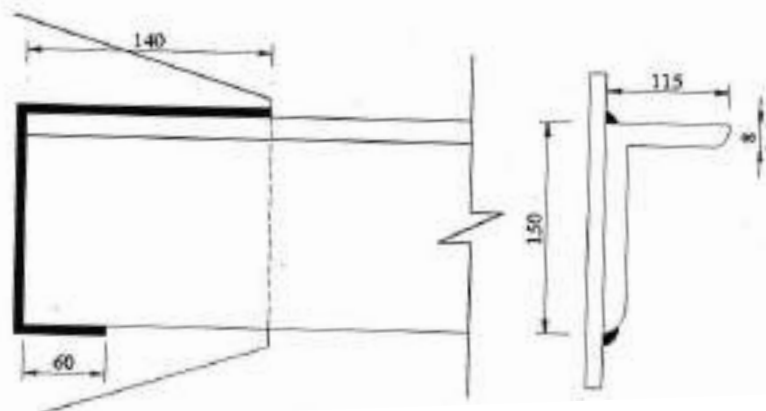
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 ii) Net section Rupture



- b)** Calculate the value of the least radius of gyration for compound column consisting of ISHB 250@536.6 N/m with one cover plate 300 mm x 20 mm on each flange. **04**

- Q.4** Design a double angle discontinuous strut to carry factored load of 135kN resulting from the combination with wind load. The length of the strut is 3.0 m between intersections. The angles are placed back-to-back (with long leg connected) and are tack bolted. Use steel of grade Fe 410. **09**
- a) Angles are placed on opposite sides of 12 mm gusset plate.  
b) Angles are placed on same side of 12 mm gusset plate.
- Q.5** Design the built up column 9 m long to carry factored axial compressive load of 1100 kN. The column is restrained in position but not in direction at both the ends. Design the column with connecting system as battens with bolted connections. Use two channel sections back-to-back. Use steel of grade Fe 410 **09**

**Section - II**

- Q.6** Find the shape factor for following sections. **10**
- a) Square of side 'a' with its diagonal parallel to zz-axis  
b) Triangular section
- Q.7** Design a laterally unsupported beam for the following data **09**
- Effective span = 4 m  
Maximum bending moment = 550 kN-m  
Maximum shear force = 200 kN  
Steel of grade Fe 410
- Q.8** Design an I section purlin for an industrial building situated in the outskirts of Allahabad, to support a galvanized corrugated iron sheet roof for the following data: **09**
- Roof cover = Galvanised corrugated (GC) sheeting (130 N/m<sup>2</sup>)  
Spacing of trusses = 6m  
Span of truss = 15 m  
Spacing of purlins = 1.5m  
Inclination of main rafter to horizontal = 30°  
Weight of GI sheets = 30 N/m<sup>2</sup>  
Wind load = 2.0kN/m<sup>2</sup>
- Q.9** A column ISHB 350 @ 661.2 N/m carries an axial compressive factored load of 1700 kN. Design a suitable bolted gusset base. The base rests on M20 grade concrete pedestal. Use 24 mm diameter bolts of grade 4.6 for making the connection. **09**

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is a unit less quantity?  
 a) Coefficient of consolidation      b) Coefficient of permeability  
 c) Compression Index                  d) Coefficient of volume change
- 2) The degree of saturation of a soil can be defined as the ratio of  
 a) weight of water to dry soil weight  
 b) volume of water to gross volume of soil  
 c) volume of water to volume of voids  
 d) weight of water to weight of soil
- 3) The shear test in which full consolidation occurs and no excess pore pressure is set up at any stage is known as \_\_\_\_\_.  
 a) CD test                                      b) CU test  
 c) UU test                                      d) None of these
- 4) For active state to develop, the backfill of the retaining wall should undergo \_\_\_\_\_.  
 a) Zero expansion                              b) Zero compression  
 c) Maximum expansion                      d) Maximum compression
- 5) The y-intercept of coulomb's failure envelope is equal to \_\_\_\_\_.  
 a) Cohesion                                      b) Maximum shear stress  
 c) Maximum normal stress                  d) Angle of shearing resistance
- 6) If a cohesive soil specimen is subjected to a vertical compressive load, the inclination of the cracks to the horizontal is \_\_\_\_\_.  
 a) 90°    b) 45°  
 c) 22.5°    d) 0°
- 7) If the poisons ratio of a backfill material is 0.5, the theoretical value of coefficient of earth pressure at rest is \_\_\_\_\_.  
 a) 0.33    b) 1.0  
 c) 0.5    d) 1.5
- 8) Optimum moisture content is the moisture content when \_\_\_\_\_.  
 a) settlement is maximum                  b) permeability is maximum  
 c) shear strength is maximum              d) dry density is maximum

- 9) For a standard compaction test, the mass of the hammer and drop of hammer are as follows \_\_\_\_\_.  
 a) 2.6 kg and 450mm                      b) 2.6 kg and 310mm  
 c) 4.8 kg and 310mm                      d) 4.89 kg and 450mm
- 10) With an increase in the liquid limit, compression index \_\_\_\_\_.  
 a) decreases                                  b) increases  
 c) remains constant                      d) may increase or decreases
- 11) The unit weight of a completely saturated soil is given by \_\_\_\_\_.  
 a)  $\frac{(G + e)\gamma_w}{1 + e}$                                   b)  $\frac{(G - 1)\gamma_w}{1 + e}$   
 c)  $\frac{(1 + e)\gamma_w}{1 - e}$                                   d)  $\frac{(1 - e)\gamma_w}{G + e}$
- 12) The maximum depth of excavation that can be made in a saturated clay having  $C = 40 \text{ kN/m}^2$ ,  $\Phi = 0^\circ$ ,  $\gamma = 20 \text{ kN/m}^3$  without any lateral support.  
 a) 5m    b) 8m  
 c) 9m    d) 10m
- 13) As per Rankin's theory, the wall friction is \_\_\_\_\_.  
 a) Equal to  $\Phi$                                   b) greater than  $\Phi$   
 c) less than  $\Phi$                                   d) zero
- 14) The constant head permeability test is suitable for \_\_\_\_\_.  
 a) coarse-grained soils                      b) fine-grained soils  
 c) both these soil                              d) neither of these soils



<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Answer any four questions. 08**
- List the various methods of water content determination of soil.
  - Draw Three Phase diagram and show details.
  - Define Degree of saturation and air content.
  - Enlist various methods of Laboratory methods to find strength parameters of soil.
  - Draw strength envelope for cohesive and non-cohesive soil.
- Q.3 a) Porosity of soil sample is 30%, and specific gravity of its particle is 2.65. 05**  
Calculate its void ratio, dry unit weight, saturated unit weight, and submerged unit weight. Also calculate the bulk unit weight of soil, if its degree of saturation is 70%.
- b) Explain the salient features of IS plasticity chart. 05**
- Q.4 a) A falling head permeability test is to be performed on a soil sample whose 05**  
permeability is  $2 \times 10^{-5}$  cm/s. What diameter of stand pipe should be used if the head is to drop from 30 cm to 25 cm in 2 minutes? The C.S. area and length of sample are 50 cm<sup>2</sup> and 8.5 cm respectively. How much time will it take for the head to drop from 45 to 30 cm for the same soil?
- b) Write a note on characteristics of flow net. 05**
- Q.5 a) Compare Direct Box shear test with Triaxial Compression Test. 05**
- b) Consolidated undrained triaxial tests are performed on two identical 05**  
specimens of saturated, remolded soil with pore pressure measurements. The observations are recorded in the table below. Determine the values of the shear parameters, for the soil both in terms of total and effective stresses.

Cell Pressure (kPa)	Deviator stress at failure (kPa)	Pore pressure at failure (kPa)
250	179	100
350	242	150

## Section - II

**Q.6 Answer any four questions. 08**

- Define zero air void line.
- Draw a typical e-p curve and label its various parts.
- Enlist the assumptions made in Rankine's theory.
- Define Passive earth pressure.
- Define compression Index.

**Q.7 a) Explain the various types of rollers used for compaction with their suitability. 05**

- b) The following results were obtained from a standard compaction test on a sample of soil. 05**

Water content %	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.03	1.99	1.96	1.92

The volume of the mould used was 950 ml. Make necessary calculations and plot the compaction curve and obtain the maximum dry density and optimum water content.

**Q.8 a) Derive Terzaghi's equation governing 1-D consolidation. State assumptions associated with the equations. 05**

- b) The laboratory consolidation data for an undisturbed clay sample are as follows  $e_1 = 1.00$ ,  $\sigma_1 = 85 \text{ kN/m}^2$  and  $e_2 = 0.80$ ,  $\sigma_2 = 465 \text{ kN/m}^2$ . Find the compression index. 05**

**Q.9 a) Derive the earth pressure coefficient for active case. 05**

- b) A retaining wall 10 m height with a smooth vertical back retains a backfill with  $C = 0 \text{ kN/m}^2$ ,  $\Phi = 25^\circ$  and  $\gamma = 17 \text{ kN/m}^3$ . What is the total Rankine's active thrust on the wall. 05**

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Optimum moisture content is the moisture content when \_\_\_\_\_.  
 a) settlement is maximum                      b) permeability is maximum  
 c) shear strength is maximum                d) dry density is maximum
- 2) For a standard compaction test, the mass of the hammer and drop of hammer are as follows \_\_\_\_\_.  
 a) 2.6 kg and 450mm                              b) 2.6 kg and 310mm  
 c) 4.8 kg and 310mm                              d) 4.89 kg and 450mm
- 3) With an increase in the liquid limit, compression index \_\_\_\_\_.  
 a) decreases    b) increases  
 c) remains constant                                  d) may increase or decreases
- 4) The unit weight of a completely saturated soil is given by \_\_\_\_\_.  
 a)  $\frac{(G + e)\gamma_w}{1 + e}$     b)  $\frac{(G - 1)\gamma_w}{1 + e}$   
 c)  $\frac{(1 + e)\gamma_w}{1 - e}$     d)  $\frac{(1 - e)\gamma_w}{G + e}$
- 5) The maximum depth of excavation that can be made in a saturated clay having  $C = 40 \text{ kN/m}^2$ ,  $\Phi = 0^\circ$ ,  $\gamma = 20 \text{ kN/m}^3$  without any lateral support.  
 a) 5m    b) 8m  
 c) 9m    d) 10m
- 6) As per Rankin's theory, the wall friction is \_\_\_\_\_.  
 a) Equal to  $\Phi$     b) greater than  $\Phi$   
 c) less than  $\Phi$     d) zero
- 7) The constant head permeability test is suitable for \_\_\_\_\_.  
 a) coarse-grained soils                              b) fine-grained soils  
 c) both these soil                                      d) neither of these soils
- 8) Which of the following is a unit less quantity?  
 a) Coefficient of consolidation                      b) Coefficient of permeability  
 c) Compression Index                                  d) Coefficient of volume change

- 9) The degree of saturation of a soil can be defined as the ratio of
  - a) weight of water to dry soil weight
  - b) volume of water to gross volume of soil
  - c) volume of water to volume of voids
  - d) weight of water to weight of soil
- 10) The shear test in which full consolidation occurs and no excess pore pressure is set up at any stage is known as \_\_\_\_\_.
  - a) CD test
  - b) CU test
  - c) UU test
  - d) None of these
- 11) For active state to develop, the backfill of the retaining wall should undergo \_\_\_\_\_.
  - a) Zero expansion
  - b) Zero compression
  - c) Maximum expansion
  - d) Maximum compression
- 12) The y-intercept of coulomb's failure envelope is equal to \_\_\_\_\_.
  - a) Cohesion
  - b) Maximum shear stress
  - c) Maximum normal stress
  - d) Angle of shearing resistance
- 13) If a cohesive soil specimen is subjected to a vertical compressive load, the inclination of the cracks to the horizontal is \_\_\_\_\_.
  - a)  $90^\circ$
  - b)  $45^\circ$
  - c)  $22.5^\circ$
  - d)  $0^\circ$
- 14) If the poissons ratio of a backfill material is 0.5, the theoretical value of coefficient of earth pressure at rest is \_\_\_\_\_.
  - a) 0.33
  - b) 1.0
  - c) 0.5
  - d) 1.5

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<b>Set Q</b>
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
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**Section – I**

- Q.2 Answer any four questions. 08**
- List the various methods of water content determination of soil.
  - Draw Three Phase diagram and show details.
  - Define Degree of saturation and air content.
  - Enlist various methods of Laboratory methods to find strength parameters of soil.
  - Draw strength envelope for cohesive and non-cohesive soil.
- Q.3 a) Porosity of soil sample is 30%, and specific gravity of its particle is 2.65. 05**  
Calculate its void ratio, dry unit weight, saturated unit weight, and submerged unit weight. Also calculate the bulk unit weight of soil, if its degree of saturation is 70%.
- b) Explain the salient features of IS plasticity chart. 05**
- Q.4 a) A falling head permeability test is to be performed on a soil sample whose 05**  
permeability is  $2 \times 10^{-5}$  cm/s. What diameter of stand pipe should be used if the head is to drop from 30 cm to 25 cm in 2 minutes? The C.S. area and length of sample are 50 cm<sup>2</sup> and 8.5 cm respectively. How much time will it take for the head to drop from 45 to 30 cm for the same soil?
- b) Write a note on characteristics of flow net. 05**
- Q.5 a) Compare Direct Box shear test with Triaxial Compression Test. 05**
- b) Consolidated undrained triaxial tests are performed on two identical 05**  
specimens of saturated, remolded soil with pore pressure measurements. The observations are recorded in the table below. Determine the values of the shear parameters, for the soil both in terms of total and effective stresses.

Cell Pressure (kPa)	Deviator stress at failure (kPa)	Pore pressure at failure (kPa)
250	179	100
350	242	150

## Section - II

**Q.6 Answer any four questions. 08**

- Define zero air void line.
- Draw a typical e-p curve and label its various parts.
- Enlist the assumptions made in Rankine's theory.
- Define Passive earth pressure.
- Define compression Index.

**Q.7 a) Explain the various types of rollers used for compaction with their suitability. 05**

- b) The following results were obtained from a standard compaction test on a sample of soil. 05**

Water content %	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.03	1.99	1.96	1.92

The volume of the mould used was 950 ml. Make necessary calculations and plot the compaction curve and obtain the maximum dry density and optimum water content.

**Q.8 a) Derive Terzaghi's equation governing 1-D consolidation. State assumptions associated with the equations. 05**

- b) The laboratory consolidation data for an undisturbed clay sample are as follows  $e_1 = 1.00$ ,  $\sigma_1 = 85 \text{ kN/m}^2$  and  $e_2 = 0.80$ ,  $\sigma_2 = 465 \text{ kN/m}^2$ . Find the compression index. 05**

**Q.9 a) Derive the earth pressure coefficient for active case. 05**

- b) A retaining wall 10 m height with a smooth vertical back retains a backfill with  $C = 0 \text{ kN/m}^2$ ,  $\Phi = 25^\circ$  and  $\gamma = 17 \text{ kN/m}^3$ . What is the total Rankine's active thrust on the wall. 05**

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Set R
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The unit weight of a completely saturated soil is given by \_\_\_\_\_.
 

a) $\frac{(G + e)\gamma_w}{1 + e}$	b) $\frac{(G - 1)\gamma_w}{1 + e}$
c) $\frac{(1 + e)\gamma_w}{1 - e}$	d) $\frac{(1 - e)\gamma_w}{G + e}$
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a) 5m	b) 8m
c) 9m	d) 10m
- 3) As per Rankin's theory, the wall friction is \_\_\_\_\_.
 

a) Equal to $\Phi$	b) greater than $\Phi$
c) less than $\Phi$	d) zero
- 4) The constant head permeability test is suitable for \_\_\_\_\_.
 

a) coarse-grained soils	b) fine-grained soils
c) both these soil	d) neither of these soils
- 5) Which of the following is a unit less quantity?
 

a) Coefficient of consolidation	b) Coefficient of permeability
c) Compression Index	d) Coefficient of volume change
- 6) The degree of saturation of a soil can be defined as the ratio of
 

a) weight of water to dry soil weight
b) volume of water to gross volume of soil
c) volume of water to volume of voids
d) weight of water to weight of soil
- 7) The shear test in which full consolidation occurs and no excess pore pressure is set up at any stage is known as \_\_\_\_\_.
 

a) CD test	b) CU test
c) UU test	d) None of these

- 8) For active state to develop, the backfill of the retaining wall should undergo \_\_\_\_\_.  
a) Zero expansion                      b) Zero compression  
c) Maximum expansion                d) Maximum compression
- 9) The y-intercept of coulomb's failure envelope is equal to \_\_\_\_\_.  
a) Cohesion                              b) Maximum shear stress  
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

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**Geotechnical Engineering**

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**Section – I**

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- b) Explain the salient features of IS plasticity chart. 05**
- Q.4 a) A falling head permeability test is to be performed on a soil sample whose 05**  
permeability is  $2 \times 10^{-5}$  cm/s. What diameter of stand pipe should be used if the head is to drop from 30 cm to 25 cm in 2 minutes? The C.S. area and length of sample are 50 cm<sup>2</sup> and 8.5 cm respectively. How much time will it take for the head to drop from 45 to 30 cm for the same soil?
- b) Write a note on characteristics of flow net. 05**
- Q.5 a) Compare Direct Box shear test with Triaxial Compression Test. 05**
- b) Consolidated undrained triaxial tests are performed on two identical 05**  
specimens of saturated, remolded soil with pore pressure measurements. The observations are recorded in the table below. Determine the values of the shear parameters, for the soil both in terms of total and effective stresses.

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350	242	150

## Section - II

**Q.6 Answer any four questions. 08**

- a) Define zero air void line.
- b) Draw a typical e-p curve and label its various parts.
- c) Enlist the assumptions made in Rankine's theory.
- d) Define Passive earth pressure.
- e) Define compression Index.

**Q.7 a) Explain the various types of rollers used for compaction with their suitability. 05**

- b) The following results were obtained from a standard compaction test on a sample of soil. 05**

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**S**

- 8) As per Rankin's theory, the wall friction is \_\_\_\_\_.
  - a) Equal to  $\Phi$
  - b) greater than  $\Phi$
  - c) less than  $\Phi$
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- 13) For active state to develop, the backfill of the retaining wall should undergo \_\_\_\_\_.
  - a) Zero expansion
  - b) Zero compression
  - c) Maximum expansion
  - d) Maximum compression
- 14) The y-intercept of Coulomb's failure envelope is equal to \_\_\_\_\_.
  - a) Cohesion
  - b) Maximum shear stress
  - c) Maximum normal stress
  - d) Angle of shearing resistance

Seat No.	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
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**Section – I**

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- b) Explain the salient features of IS plasticity chart. 05**
- Q.4 a) A falling head permeability test is to be performed on a soil sample whose 05**  
 permeability is  $2 \times 10^{-5}$  cm/s. What diameter of stand pipe should be used if the head is to drop from 30 cm to 25 cm in 2 minutes? The C.S. area and length of sample are 50 cm<sup>2</sup> and 8.5 cm respectively. How much time will it take for the head to drop from 45 to 30 cm for the same soil?
- b) Write a note on characteristics of flow net. 05**
- Q.5 a) Compare Direct Box shear test with Triaxial Compression Test. 05**  
**b) Consolidated undrained triaxial tests are performed on two identical 05**  
 specimens of saturated, remolded soil with pore pressure measurements. The observations are recorded in the table below. Determine the values of the shear parameters, for the soil both in terms of total and effective stresses.

Cell Pressure (kPa)	Deviator stress at failure (kPa)	Pore pressure at failure (kPa)
250	179	100
350	242	150

## Section - II

**Q.6 Answer any four questions. 08**

- Define zero air void line.
- Draw a typical e-p curve and label its various parts.
- Enlist the assumptions made in Rankine's theory.
- Define Passive earth pressure.
- Define compression Index.

**Q.7 a) Explain the various types of rollers used for compaction with their suitability. 05**

- b) The following results were obtained from a standard compaction test on a sample of soil. 05**

Water content %	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.03	1.99	1.96	1.92

The volume of the mould used was 950 ml. Make necessary calculations and plot the compaction curve and obtain the maximum dry density and optimum water content.

**Q.8 a) Derive Terzaghi's equation governing 1-D consolidation. State assumptions associated with the equations. 05**

- b) The laboratory consolidation data for an undisturbed clay sample are as follows  $e_1 = 1.00$ ,  $\sigma_1 = 85 \text{ kN/m}^2$  and  $e_2 = 0.80$ ,  $\sigma_2 = 465 \text{ kN/m}^2$ . Find the compression index. 05**

**Q.9 a) Derive the earth pressure coefficient for active case. 05**

- b) A retaining wall 10 m height with a smooth vertical back retains a backfill with  $C = 0 \text{ kN/m}^2$ ,  $\Phi = 25^\circ$  and  $\gamma = 17 \text{ kN/m}^3$ . What is the total Rankine's active thrust on the wall. 05**

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Identify the correct order of engineering surveys for highway alignment \_\_\_\_\_.
  - a) Final location and detailed surveys, map study, Reconnaissance Survey, Preliminary survey
  - b) Reconnaissance Survey, Final location and detailed surveys, map study and Preliminary survey
  - c) Map study, Reconnaissance Survey, Preliminary survey and Final location and detailed surveys
  - d) Preliminary survey, Final location and detailed surveys, map study and Reconnaissance Survey
  
- 2) The extra widening required for a two-lane national highway at a horizontal curve of 300m radius, considering the wheelbase of 8m and a design speed of 100kmph \_\_\_\_\_.
 

a) 0.42m	b) 0.62m
c) 0.82m	d) 0.92m
  
- 3) Which of the following are requirements for the design of a transition curve for a highway system?
  - 1) Rate of change of grade
  - 2) Rate of change of radial acceleration
  - 3) Rate of change of super elevation
  - 4) Rate of change of curvature

Select the correct answer using the code given below:

a) 1,2 and 3	b) 2,1 and 4
c) 1,3 and 4	d) 2,3 and 4
  
- 4) The specific gravity of the paving bitumen as per IS-73-1992 lies between \_\_\_\_\_.
 

a) 1.06 to 1.10	b) 1.02 to 10.06
c) 0.97 to 1.02	d) 0.92 to 0.97

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section - I, Q. No. 2 is compulsory and solve any ONE full question from remaining questions Q. No. 3 and 4.  
 2) In Section - II, Q. No. 5 is compulsory and solve any ONE full question from remaining questions Q. No. 6 and 7.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions.** **10**

- a) Briefly explain the engineering surveys needed for locating a new highway.
- b) Write a short on the importance of
  - 1) Camber
  - 2) Shoulders
  - 3) Super elevation
- c) Derive the expression for finding the overtaking sight distance on a highway.

**Q.3 Answer any three questions.** **18**

- a) The speeds of overtaking and overtaken vehicle are 65 and 40kmph respectively. If the average acceleration is  $0.92\text{m/sec}^2$ . Determine the overtaking sight distance indicating the details of the overtaking operations. Assume the reaction time of the driver = 2.0sec.
- b) A valley curve of the State Highway is formed by a descending gradient of 1 in 20 meeting an ascending gradient of 1 in 30. Design the length of a valley curve to fulfill both comfort condition and head light sight distance required for a design speed of 80kmph. Assume allowable rate of change of centrifugal acceleration  $C=0.60\text{m/sec}^3$ . Consider reaction time=2.5sec and coefficient of longitudinal friction,  $f=0.35$
- c) The load-penetration values of CBR tests conducted on soil specimens are given below. Determine the average CBR value of the soil if 10 divisions of the dial represent 40 kg load, on in the calibration chart of the proving ring. Plot the graph.

Penetration, mm	Load in Divisions
0.0	0
0.5	10
1.0	18
1.5	26
2.0	34
2.5	40
3.0	50
4.0	62
5.0	70
7.5	87
10.0	95
12.5	109

- d) A two-lane highway has a horizontal curve of a radius of 250m and the total pavement width is 7.6m at the curve. A minimum sight distance of 240m is to be provided at this curve. Assuming the length of the curve to be greater than the sight distance, determine the set-back distance up to which all obstructions should be removed.

**Q.4 Answer any three questions.****18**

- a) Explain ESWL. Briefly explain the graphical method determination of ESWL.
- b) Define Vehicle Damage Factor. Determine the Equivalent Wheel Load Factor or VDF value of the following two axle loads in terms of the standard axle load of 8.16t.
- 1) LCV with rear axle load of 2.0t
  - 2) HCV with rear axle load of 15.5t
- c) Explain the plate bearing test procedure and how the modulus of subgrade reaction, K is determined.
- d) List different tests on road aggregates and mention their advantages and limitations.

**Section – II****Q.5 Answer any two questions.****10**

- a) C.C. Pavement is constructed using the following data
- 1) Modulus of elasticity  $3 \times 10^5 \text{ kg/cm}^2$
  - 2) Poisson's ratio=0.15
  - 3) Thickness of CC pavement = 18 cm
  - 4) Modulus of subgrade reaction- $6.0 \text{ kg/cm}^3$
  - 5) Wheel load = 5100 kg
  - 6) Radius of loaded area = 15 cm
  - 7) Relative stiffness of slab to subgrade ( $l$ ) =70.61cm
  - 8) Equivalent radius of resisting section( $b$ )=14cm
- Calculate stresses at the Interior, Edge, and corner by Westergaard's method.
- b) A traffic survey conducted on four lane divided carriageway road reported traffic of 1400 CVPD (in each directions). Assuming growth rate of 5% with design life 20 years and vehicle damage factor of 3.5, calculate design traffic to be used in pavement design in terms of million standard axles (msa) as per IRC, lane distribution factor=0.75.
- c) Explain in detail the factors to be considered for the design of flexible pavement.

**Q.6 Answer any three questions.****18**

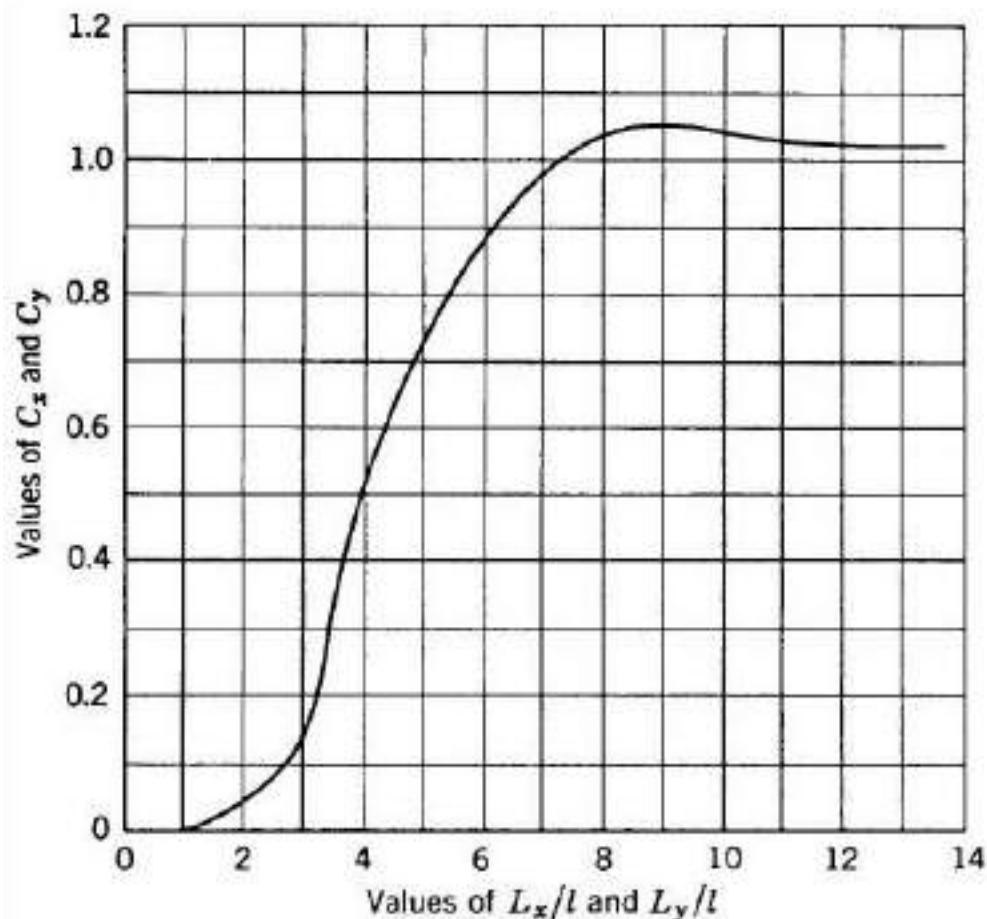
- a) Mention the specifications of materials and construction steps for Bituminous Concrete (BC) roads.
- b) State the objectives of tunnel lining & discuss different materials used in tunnel lining.
- c) If the CBR of the soil used in the upper 500 mm of the embankment is 8% and the CBR of the borrow soil used for preparing the 500 mm thick compacted subgrade above embankment is 20%, what is the effective subgrade Modulus/CBR for design of flexible pavement? Consider Poisson's ratio=0.35. Use surface deflection,  $\delta = 1.41 \text{ mm}$  from IIT PAVE software. Draw a neat sketch of equivalent subgrade system diagram.

- d) Write a brief note on surface and sub surface drainage of road system.

**Q.7 Answer any three questions.**

**18**

- a) Determine the warping stresses at interior, edge and corner of a 25cm thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction  $K$  is  $6.9 \text{ kg/cm}^3$  and radius of loaded area is 15cm. Assume temperature differential during day to be  $0.6^\circ\text{C}$  per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of  $0.4^\circ\text{C}$  per cm slab thickness during the night (for warping stress at the corner). Assume  $e=10 \times 10^{-6}$  per  $^\circ\text{C}$ ,  $E=3 \times 10^5 \text{ kg/cm}^2$ ,  $\mu=0.15$ . Use Bradbury chart given in **Figure-1**.
- b) State methods of tunneling in soft rock. Explain with sketch any one method.
- c) With the help of a neat diagram, explain the method of determining the aggregate mixes by Rothfutch's method.
- d) With the help of a neat sketch explain the different components parts of a flexible pavement. Also mention their functions.



**Fig. I – Bradbury Chart**

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Identify the correct statement regarding the locations of critical strains in the design of flexible pavement.
  - a) Tensile strain at the bottom of subgrade and vertical compressive strain on top of bituminous layer
  - b) Tensile strain at the top of subgrade and vertical compressive strain on bottom of bituminous layer
  - c) Tensile strain at the bottom of bituminous layer and vertical compressive strain on top of subgrade
  - d) Vertical compressive strain at the bottom of subgrade and Tensile strain at the bottom of bituminous layer
- 2) Bitumen grade 80/100 indicates that under the standard test conditions, the penetration value of bitumen would vary from,
 

a) 0.8mm to 1mm	b) 8mm to 10mm
c) 8cm to 10cm	d) 0.08mm to 0.1mm
- 3) If ruling gradient is 1 in 20 on a horizontal curve of radius 75m, then compensated grade should be \_\_\_\_\_.
 

a) 1 in 20	b) 1 in 15
c) 1 in 30	d) 1 in 25
- 4) What are the standards for testing of road macadam in Aggregate Impact Test?
 

a) 14kg wt, 38cm drop, 15 blows	b) 14kg wt, 35cm drop, 20 blows
c) 18kg wt, 35cm drop, 15 blows	d) 18kg wt, 30cm drop, 20 blows
- 5) In tunnelling mucking means \_\_\_\_\_.
 

a) Drilling holes	b) blasting
c) Removal of debris	d) none
- 6) Which one of the following methods of tunneling is used in hard rock?
 

a) Forepoling method	b) Needle beam method
c) Heading and benching method	d) Shield tunneling method

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section - I, Q. No. 2 is compulsory and solve any ONE full question from remaining questions Q. No. 3 and 4.  
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 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions. 10**

- Briefly explain the engineering surveys needed for locating a new highway.
- Write a short on the importance of
  - Camber
  - Shoulders
  - Super elevation
- Derive the expression for finding the overtaking sight distance on a highway.

**Q.3 Answer any three questions. 18**

- The speeds of overtaking and overtaken vehicle are 65 and 40kmph respectively. If the average acceleration is  $0.92\text{m/sec}^2$ . Determine the overtaking sight distance indicating the details of the overtaking operations. Assume the reaction time of the driver = 2.0sec.
- A valley curve of the State Highway is formed by a descending gradient of 1 in 20 meeting an ascending gradient of 1 in 30. Design the length of a valley curve to fulfill both comfort condition and head light sight distance required for a design speed of 80kmph. Assume allowable rate of change of centrifugal acceleration  $C=0.60\text{m/sec}^3$ . Consider reaction time=2.5sec and coefficient of longitudinal friction,  $f=0.35$
- The load-penetration values of CBR tests conducted on soil specimens are given below. Determine the average CBR value of the soil if 10 divisions of the dial represent 40 kg load, on in the calibration chart of the proving ring. Plot the graph.

Penetration, mm	Load in Divisions
0.0	0
0.5	10
1.0	18
1.5	26
2.0	34
2.5	40
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5.0	70
7.5	87
10.0	95
12.5	109

- d) A two-lane highway has a horizontal curve of a radius of 250m and the total pavement width is 7.6m at the curve. A minimum sight distance of 240m is to be provided at this curve. Assuming the length of the curve to be greater than the sight distance, determine the set-back distance up to which all obstructions should be removed.

**Q.4 Answer any three questions.****18**

- a) Explain ESWL. Briefly explain the graphical method determination of ESWL.
- b) Define Vehicle Damage Factor. Determine the Equivalent Wheel Load Factor or VDF value of the following two axle loads in terms of the standard axle load of 8.16t.
- 1) LCV with rear axle load of 2.0t
  - 2) HCV with rear axle load of 15.5t
- c) Explain the plate bearing test procedure and how the modulus of subgrade reaction, K is determined.
- d) List different tests on road aggregates and mention their advantages and limitations.

**Section – II****Q.5 Answer any two questions.****10**

- a) C.C. Pavement is constructed using the following data
- 1) Modulus of elasticity  $3 \times 10^5 \text{ kg/cm}^2$
  - 2) Poisson's ratio=0.15
  - 3) Thickness of CC pavement = 18 cm
  - 4) Modulus of subgrade reaction- $6.0 \text{ kg/cm}^3$
  - 5) Wheel load = 5100 kg
  - 6) Radius of loaded area = 15 cm
  - 7) Relative stiffness of slab to subgrade ( $l$ ) =70.61cm
  - 8) Equivalent radius of resisting section( $b$ )=14cm
- Calculate stresses at the Interior, Edge, and corner by Westergaard's method.
- b) A traffic survey conducted on four lane divided carriageway road reported traffic of 1400 CVPD (in each directions). Assuming growth rate of 5% with design life 20 years and vehicle damage factor of 3.5, calculate design traffic to be used in pavement design in terms of million standard axles (msa) as per IRC, lane distribution factor=0.75.
- c) Explain in detail the factors to be considered for the design of flexible pavement.

**Q.6 Answer any three questions.****18**

- a) Mention the specifications of materials and construction steps for Bituminous Concrete (BC) roads.
- b) State the objectives of tunnel lining & discuss different materials used in tunnel lining.
- c) If the CBR of the soil used in the upper 500 mm of the embankment is 8% and the CBR of the borrow soil used for preparing the 500 mm thick compacted subgrade above embankment is 20%, what is the effective subgrade Modulus/CBR for design of flexible pavement? Consider Poisson's ratio=0.35. Use surface deflection,  $\delta = 1.41 \text{ mm}$  from IIT PAVE software. Draw a neat sketch of equivalent subgrade system diagram.

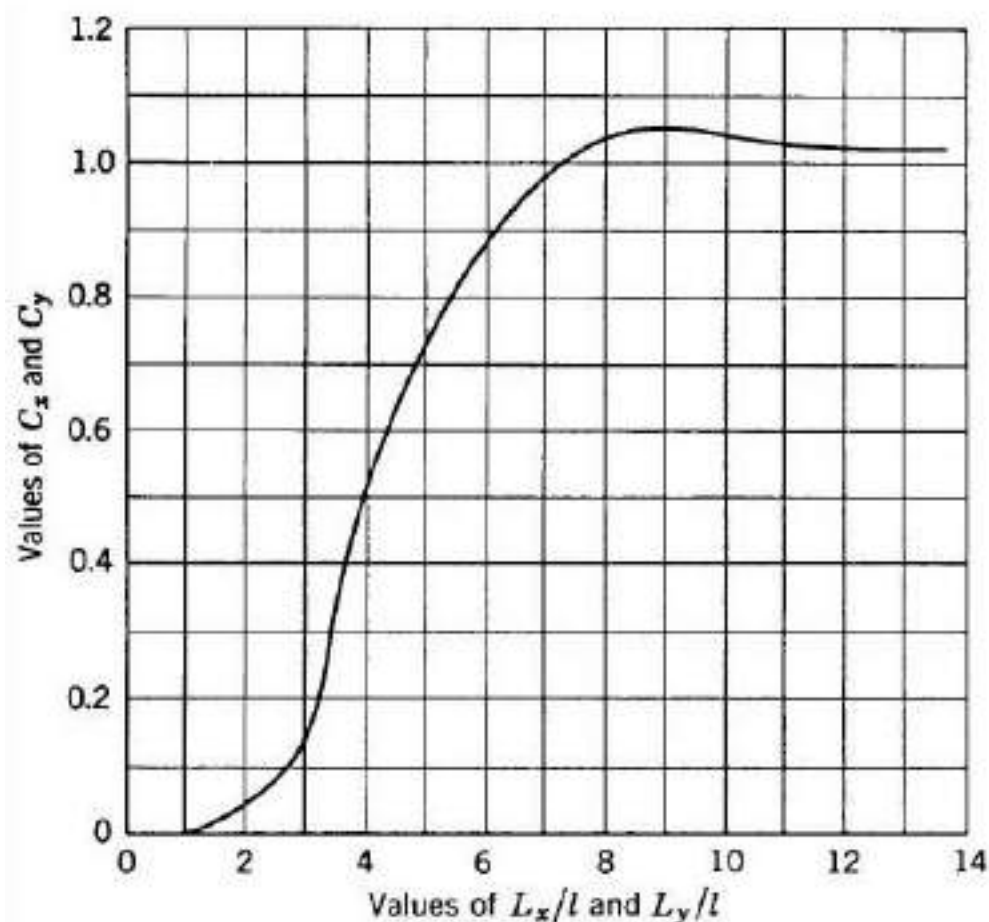


- d) Write a brief note on surface and sub surface drainage of road system.

**Q.7 Answer any three questions.**

**18**

- a) Determine the warping stresses at interior, edge and corner of a 25cm thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction  $K$  is  $6.9 \text{ kg/cm}^3$  and radius of loaded area is 15cm. Assume temperature differential during day to be  $0.6^\circ\text{C}$  per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of  $0.4^\circ\text{C}$  per cm slab thickness during the night (for warping stress at the corner). Assume  $e=10 \times 10^{-6}$  per  $^\circ\text{C}$ ,  $E=3 \times 10^5 \text{ kg/cm}^2$ ,  $\mu=0.15$ . Use Bradbury chart given in **Figure-1**.
- b) State methods of tunneling in soft rock. Explain with sketch any one method.
- c) With the help of a neat diagram, explain the method of determining the aggregate mixes by Rothfutch's method.
- d) With the help of a neat sketch explain the different components parts of a flexible pavement. Also mention their functions.



**Fig. I – Bradbury Chart**



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Friday, 24-02-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What are the standards for testing of road macadam in Aggregate Impact Test?
 

a) 14kg wt, 38cm drop, 15 blows	b) 14kg wt, 35cm drop, 20 blows
c) 18kg wt, 35cm drop, 15 blows	d) 18kg wt, 30cm drop, 20 blows
- 2) In tunnelling mucking means \_\_\_\_\_.
 

a) Drilling holes	b) blasting
c) Removal of debris	d) none
- 3) Which one of the following methods of tunneling is used in hard rock?
 

a) Forepoling method	b) Needle beam method
c) Heading and benching method	d) Shield tunneling method
- 4) The value of camber recommended for cement concrete roads in areas of heavy rainfall is, \_\_\_\_\_.
 

a) 1 in 50	b) 1 in 25
c) 1 in 40	d) 1 in 33
- 5) Identify the correct order of engineering surveys for highway alignment \_\_\_\_\_.
 

a) Final location and detailed surveys, map study, Reconnaissance Survey, Preliminary survey
b) Reconnaissance Survey, Final location and detailed surveys, map study and Preliminary survey
c) Map study, Reconnaissance Survey, Preliminary survey and Final location and detailed surveys
d) Preliminary survey, Final location and detailed surveys, map study and Reconnaissance Survey
- 6) The extra widening required for a two-lane national highway at a horizontal curve of 300m radius, considering the wheelbase of 8m and a design speed of 100kmph \_\_\_\_\_.
 

a) 0.42m	b) 0.62m
c) 0.82m	d) 0.92m

- 7) Which of the following are requirements for the design of a transition curve for a highway system?
- 1) Rate of change of grade
  - 2) Rate of change of radial acceleration
  - 3) Rate of change of super elevation
  - 4) Rate of change of curvature
- Select the correct answer using the code given below:
- |              |              |
|--------------|--------------|
| a) 1,2 and 3 | b) 2,1 and 4 |
| c) 1,3 and 4 | d) 2,3 and 4 |
- 8) The specific gravity of the paving bitumen as per IS-73-1992 lies between \_\_\_\_\_
- |                 |                  |
|-----------------|------------------|
| a) 1.06 to 1.10 | b) 1.02 to 10.06 |
| c) 0.97 to 1.02 | d) 0.92 to 0.97  |
- 9) For a given road, the safe stopping sight distance is 80m and the passing sight distance is 300m. What is the intermediate sight distance?
- |         |         |
|---------|---------|
| a) 220m | b) 190m |
| c) 160m | d) 150m |
- 10) The recommended camber value for a thin bituminous surface for a heavy rainfall area \_\_\_\_\_.
- |         |         |
|---------|---------|
| a) 2.0% | b) 1.5% |
| c) 3.0% | d) 2.5% |
- 11) Which one of the following pairs is **NOT** correctly matched?
- |                      |                         |
|----------------------|-------------------------|
| a) Horizontal Curves | Super elevation         |
| b) Los Angeles Test  | Hardness of aggregates  |
| c) Impact Test       | Toughness of aggregates |
| d) Soundness Test    | Purity of aggregates    |
- 12) Identify the correct statement regarding the locations of critical strains in the design of flexible pavement.
- a) Tensile strain at the bottom of subgrade and vertical compressive strain on top of bituminous layer
  - b) Tensile strain at the top of subgrade and vertical compressive strain on bottom of bituminous layer
  - c) Tensile strain at the bottom of bituminous layer and vertical compressive strain on top of subgrade
  - d) Vertical compressive strain at the bottom of subgrade and Tensile strain at the bottom of bituminous layer
- 13) Bitumen grade 80/100 indicates that under the standard test conditions, the penetration value of bitumen would vary from,
- |                 |                    |
|-----------------|--------------------|
| a) 0.8mm to 1mm | b) 8mm to 10mm     |
| c) 8cm to 10cm  | d) 0.08mm to 0.1mm |
- 14) If ruling gradient is 1 in 20 on a horizontal curve of radius 75m, then compensated grade should be \_\_\_\_\_.
- |            |            |
|------------|------------|
| a) 1 in 20 | b) 1 in 15 |
| c) 1 in 30 | d) 1 in 25 |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section - I, Q. No. 2 is compulsory and solve any ONE full question from remaining questions Q. No. 3 and 4.  
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**Section – I**

**Q.2 Answer any two questions. 10**

- Briefly explain the engineering surveys needed for locating a new highway.
- Write a short on the importance of
  - Camber
  - Shoulders
  - Super elevation
- Derive the expression for finding the overtaking sight distance on a highway.

**Q.3 Answer any three questions. 18**

- The speeds of overtaking and overtaken vehicle are 65 and 40kmph respectively. If the average acceleration is  $0.92\text{m/sec}^2$ . Determine the overtaking sight distance indicating the details of the overtaking operations. Assume the reaction time of the driver = 2.0sec.
- A valley curve of the State Highway is formed by a descending gradient of 1 in 20 meeting an ascending gradient of 1 in 30. Design the length of a valley curve to fulfill both comfort condition and head light sight distance required for a design speed of 80kmph. Assume allowable rate of change of centrifugal acceleration  $C=0.60\text{m/sec}^3$ . Consider reaction time=2.5sec and coefficient of longitudinal friction,  $f=0.35$
- The load-penetration values of CBR tests conducted on soil specimens are given below. Determine the average CBR value of the soil if 10 divisions of the dial represent 40 kg load, on in the calibration chart of the proving ring. Plot the graph.

Penetration, mm	Load in Divisions
0.0	0
0.5	10
1.0	18
1.5	26
2.0	34
2.5	40
3.0	50
4.0	62
5.0	70
7.5	87
10.0	95
12.5	109

- d) A two-lane highway has a horizontal curve of a radius of 250m and the total pavement width is 7.6m at the curve. A minimum sight distance of 240m is to be provided at this curve. Assuming the length of the curve to be greater than the sight distance, determine the set-back distance up to which all obstructions should be removed.

**Q.4 Answer any three questions.****18**

- a) Explain ESWL. Briefly explain the graphical method determination of ESWL.
- b) Define Vehicle Damage Factor. Determine the Equivalent Wheel Load Factor or VDF value of the following two axle loads in terms of the standard axle load of 8.16t.
  - 1) LCV with rear axle load of 2.0t
  - 2) HCV with rear axle load of 15.5t
- c) Explain the plate bearing test procedure and how the modulus of subgrade reaction, K is determined.
- d) List different tests on road aggregates and mention their advantages and limitations.

**Section – II****Q.5 Answer any two questions.****10**

- a) C.C. Pavement is constructed using the following data
  - 1) Modulus of elasticity  $3 \times 10^5 \text{ kg/cm}^2$
  - 2) Poisson's ratio=0.15
  - 3) Thickness of CC pavement = 18 cm
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  - 5) Wheel load = 5100 kg
  - 6) Radius of loaded area = 15 cm
  - 7) Relative stiffness of slab to subgrade ( $l$ ) =70.61cm
  - 8) Equivalent radius of resisting section( $b$ )=14cm
 Calculate stresses at the Interior, Edge, and corner by Westergaard's method.
- b) A traffic survey conducted on four lane divided carriageway road reported traffic of 1400 CVPD (in each directions). Assuming growth rate of 5% with design life 20 years and vehicle damage factor of 3.5, calculate design traffic to be used in pavement design in terms of million standard axles (msa) as per IRC, lane distribution factor=0.75.
- c) Explain in detail the factors to be considered for the design of flexible pavement.

**Q.6 Answer any three questions.****18**

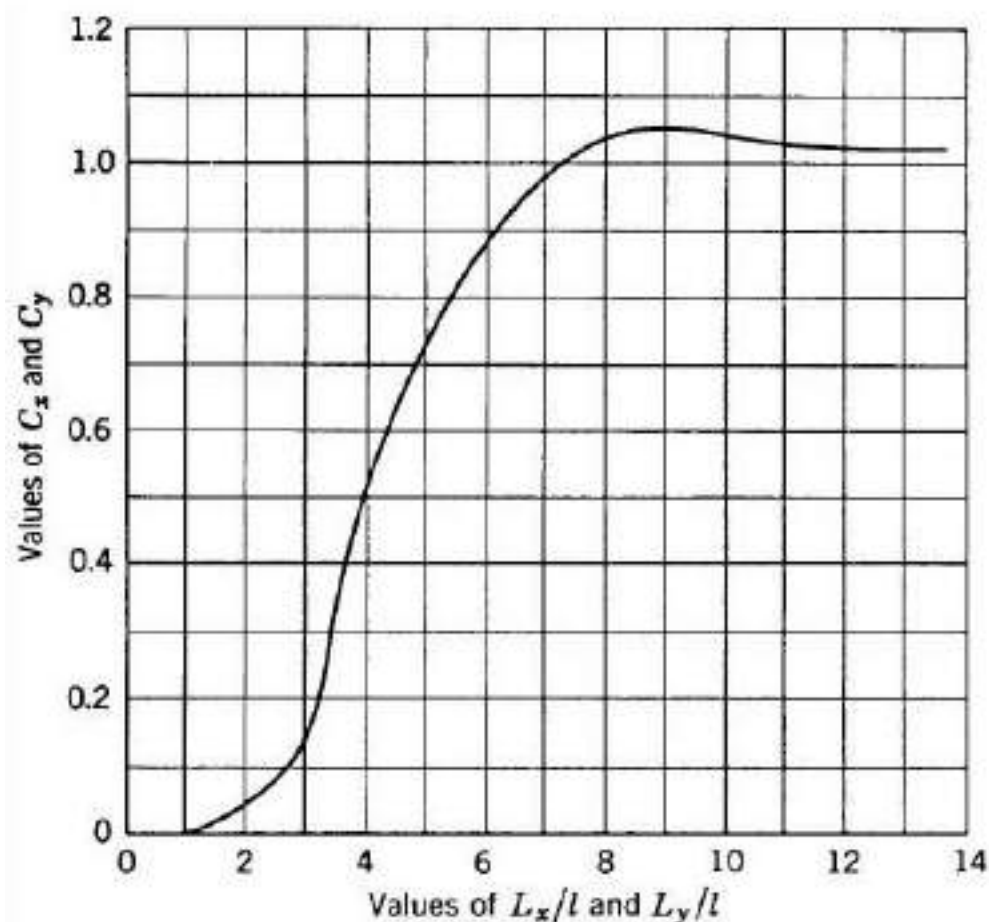
- a) Mention the specifications of materials and construction steps for Bituminous Concrete (BC) roads.
- b) State the objectives of tunnel lining & discuss different materials used in tunnel lining.
- c) If the CBR of the soil used in the upper 500 mm of the embankment is 8% and the CBR of the borrow soil used for preparing the 500 mm thick compacted subgrade above embankment is 20%, what is the effective subgrade Modulus/CBR for design of flexible pavement? Consider Poisson's ratio=0.35. Use surface deflection,  $\delta = 1.41 \text{ mm}$  from IIT PAVE software. Draw a neat sketch of equivalent subgrade system diagram.

- d) Write a brief note on surface and sub surface drainage of road system.

**Q.7 Answer any three questions.**

**18**

- a) Determine the warping stresses at interior, edge and corner of a 25cm thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction  $K$  is  $6.9 \text{ kg/cm}^3$  and radius of loaded area is 15cm. Assume temperature differential during day to be  $0.6^\circ\text{C}$  per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of  $0.4^\circ\text{C}$  per cm slab thickness during the night (for warping stress at the corner). Assume  $e=10 \times 10^{-6}$  per  $^\circ\text{C}$ ,  $E=3 \times 10^5 \text{ kg/cm}^2$ ,  $\mu=0.15$ . Use Bradbury chart given in **Figure-1**.
- b) State methods of tunneling in soft rock. Explain with sketch any one method.
- c) With the help of a neat diagram, explain the method of determining the aggregate mixes by Rothfutch's method.
- d) With the help of a neat sketch explain the different components parts of a flexible pavement. Also mention their functions.



**Fig. I – Bradbury Chart**

<b>Seat No.</b>	
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## Highway & Tunnel Engineering

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- 1) The recommended camber value for a thin bituminous surface for a heavy rainfall area \_\_\_\_\_.  
a) 2.0%                                      b) 1.5%  
c) 3.0%                                      d) 2.5%
- 2) Which one of the following pairs is **NOT** correctly matched?  
a) Horizontal Curves                      Super elevation  
b) Los Angeles Test                      Hardness of aggregates  
c) Impact Test                              Toughness of aggregates  
d) Soundness Test                          Purity of aggregates
- 3) Identify the correct statement regarding the locations of critical strains in the design of flexible pavement.  
a) Tensile strain at the bottom of subgrade and vertical compressive strain on top of bituminous layer  
b) Tensile strain at the top of subgrade and vertical compressive strain on bottom of bituminous layer  
c) Tensile strain at the bottom of bituminous layer and vertical compressive strain on top of subgrade  
d) Vertical compressive strain at the bottom of subgrade and Tensile strain at the bottom of bituminous layer
- 4) Bitumen grade 80/100 indicates that under the standard test conditions, the penetration value of bitumen would vary from,  
a) 0.8mm to 1mm                              b) 8mm to 10mm  
c) 8cm to 10cm                                d) 0.08mm to 0.1mm
- 5) If ruling gradient is 1 in 20 on a horizontal curve of radius 75m, then compensated grade should be \_\_\_\_\_.  
a) 1 in 20                                      b) 1 in 15  
c) 1 in 30                                      d) 1 in 25
- 6) What are the standards for testing of road macadam in Aggregate Impact Test?  
a) 14kg wt, 38cm drop, 15 blows      b) 14kg wt, 35cm drop, 20 blows  
c) 18kg wt, 35cm drop, 15 blows      d) 18kg wt, 30cm drop, 20 blows

- Page 17 of 20



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section - I, Q. No. 2 is compulsory and solve any ONE full question from remaining questions Q. No. 3 and 4.  
 2) In Section - II, Q. No. 5 is compulsory and solve any ONE full question from remaining questions Q. No. 6 and 7.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions. 10**

- Briefly explain the engineering surveys needed for locating a new highway.
- Write a short on the importance of
  - Camber
  - Shoulders
  - Super elevation
- Derive the expression for finding the overtaking sight distance on a highway.

**Q.3 Answer any three questions. 18**

- The speeds of overtaking and overtaken vehicle are 65 and 40kmph respectively. If the average acceleration is  $0.92\text{m/sec}^2$ . Determine the overtaking sight distance indicating the details of the overtaking operations. Assume the reaction time of the driver = 2.0sec.
- A valley curve of the State Highway is formed by a descending gradient of 1 in 20 meeting an ascending gradient of 1 in 30. Design the length of a valley curve to fulfill both comfort condition and head light sight distance required for a design speed of 80kmph. Assume allowable rate of change of centrifugal acceleration  $C=0.60\text{m/sec}^3$ . Consider reaction time=2.5sec and coefficient of longitudinal friction,  $f=0.35$
- The load-penetration values of CBR tests conducted on soil specimens are given below. Determine the average CBR value of the soil if 10 divisions of the dial represent 40 kg load, on in the calibration chart of the proving ring. Plot the graph.

Penetration, mm	Load in Divisions
0.0	0
0.5	10
1.0	18
1.5	26
2.0	34
2.5	40
3.0	50
4.0	62
5.0	70
7.5	87
10.0	95
12.5	109



- d) A two-lane highway has a horizontal curve of a radius of 250m and the total pavement width is 7.6m at the curve. A minimum sight distance of 240m is to be provided at this curve. Assuming the length of the curve to be greater than the sight distance, determine the set-back distance up to which all obstructions should be removed.

**Q.4 Answer any three questions.****18**

- a) Explain ESWL. Briefly explain the graphical method determination of ESWL.
- b) Define Vehicle Damage Factor. Determine the Equivalent Wheel Load Factor or VDF value of the following two axle loads in terms of the standard axle load of 8.16t.
  - 1) LCV with rear axle load of 2.0t
  - 2) HCV with rear axle load of 15.5t
- c) Explain the plate bearing test procedure and how the modulus of subgrade reaction,  $K$  is determined.
- d) List different tests on road aggregates and mention their advantages and limitations.

**Section – II****Q.5 Answer any two questions.****10**

- a) C.C. Pavement is constructed using the following data
  - 1) Modulus of elasticity  $3 \times 10^5 \text{ kg/cm}^2$
  - 2) Poisson's ratio=0.15
  - 3) Thickness of CC pavement = 18 cm
  - 4) Modulus of subgrade reaction- $6.0 \text{ kg/cm}^3$
  - 5) Wheel load = 5100 kg
  - 6) Radius of loaded area = 15 cm
  - 7) Relative stiffness of slab to subgrade ( $l$ ) =70.61cm
  - 8) Equivalent radius of resisting section( $b$ )=14cm
 Calculate stresses at the Interior, Edge, and corner by Westergaard's method.
- b) A traffic survey conducted on four lane divided carriageway road reported traffic of 1400 CVPD (in each directions). Assuming growth rate of 5% with design life 20 years and vehicle damage factor of 3.5, calculate design traffic to be used in pavement design in terms of million standard axles (msa) as per IRC, lane distribution factor=0.75.
- c) Explain in detail the factors to be considered for the design of flexible pavement.

**Q.6 Answer any three questions.****18**

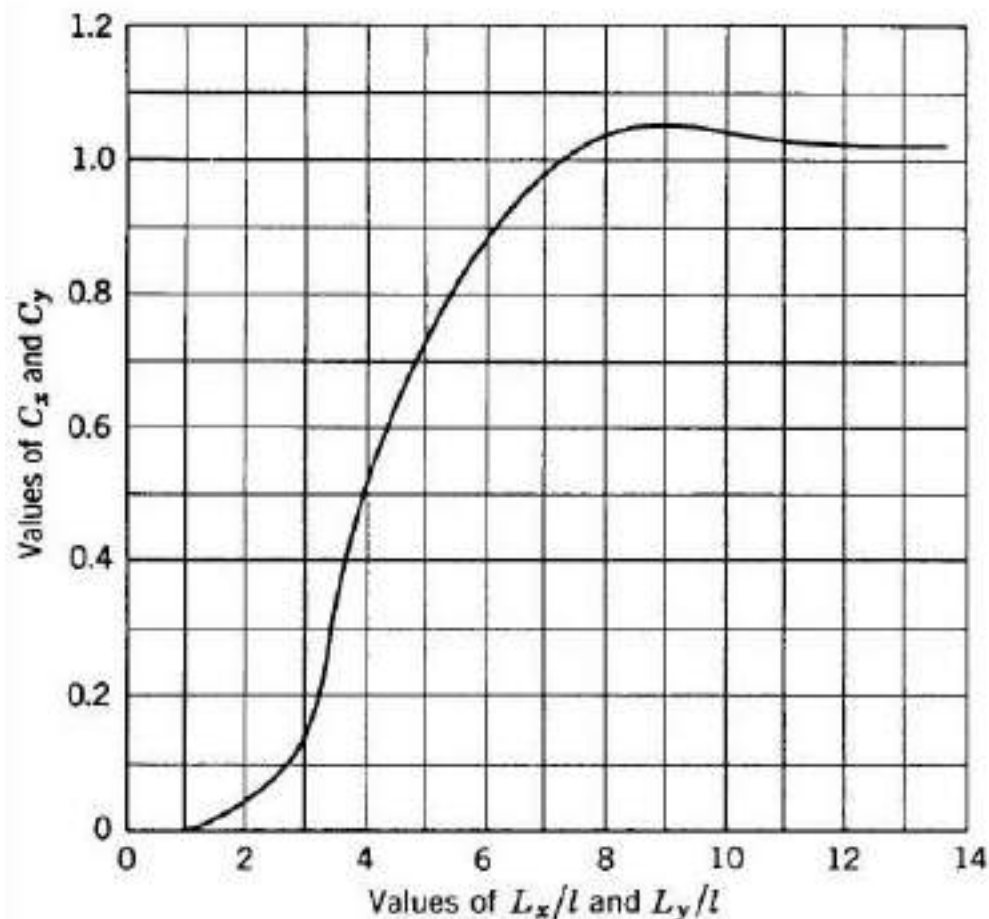
- a) Mention the specifications of materials and construction steps for Bituminous Concrete (BC) roads.
- b) State the objectives of tunnel lining & discuss different materials used in tunnel lining.
- c) If the CBR of the soil used in the upper 500 mm of the embankment is 8% and the CBR of the borrow soil used for preparing the 500 mm thick compacted subgrade above embankment is 20%, what is the effective subgrade Modulus/CBR for design of flexible pavement? Consider Poisson's ratio=0.35. Use surface deflection,  $\delta = 1.41 \text{ mm}$  from IIT PAVE software. Draw a neat sketch of equivalent subgrade system diagram.

- d) Write a brief note on surface and sub surface drainage of road system.

**Q.7 Answer any three questions.**

**18**

- a) Determine the warping stresses at interior, edge and corner of a 25cm thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction  $K$  is  $6.9 \text{ kg/cm}^3$  and radius of loaded area is 15cm. Assume temperature differential during day to be  $0.6^\circ\text{C}$  per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of  $0.4^\circ\text{C}$  per cm slab thickness during the night (for warping stress at the corner). Assume  $e=10 \times 10^{-6}$  per  $^\circ\text{C}$ ,  $E=3 \times 10^5 \text{ kg/cm}^2$ ,  $\mu=0.15$ . Use Bradbury chart given in **Figure-1**.
- b) State methods of tunneling in soft rock. Explain with sketch any one method.
- c) With the help of a neat diagram, explain the method of determining the aggregate mixes by Rothfutch's method.
- d) With the help of a neat sketch explain the different components parts of a flexible pavement. Also mention their functions.



**Fig. I – Bradbury Chart**

<b>Seat No.</b>	
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# Hydrology and Water Resources Engineering

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
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- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- 1) Catchment area is also known as \_\_\_\_\_.
  - a) Watershed area
  - b) Drainage Basin
  - c) Basin
  - d) All the above
- 2) Evaporation is a \_\_\_\_\_.
  - a) Cooling process
  - b) Heating process
  - c) Combined process
  - d) None of above
- 3) Khosla's formula for monthly runoff  $R_m$  due to monthly rainfall  $P_m$  is  $R_m = P_m - L_m$  Where  $L_m$  is \_\_\_\_\_.
  - a) a constant
  - b) monthly loss and depends on the mean monthly catchment temperature
  - c) a monthly loss coefficient depending on the antecedent precipitation index
  - d) a monthly loss depending on the infiltration characteristics of the catchment
- 4) The theory or unit hydrograph was first introduced by \_\_\_\_\_.
  - a) Snyder
  - b) VenTe chow
  - c) Bernard
  - d) L. K. Sherman
- 5) A hyetograph is a plot of \_\_\_\_\_.
  - a) Cumulative rainfall vs time
  - b) Rainfall intensity vs time
  - c) Rainfall depth vs duration
  - d) Discharge vs time
- 6) When the slope of the ground is more than  $16^\circ$ , it has an effect in \_\_\_\_\_.
  - a) Increasing the rate of infiltration
  - b) Reducing the rate of infiltration
  - c) Has no effect on the rate of infiltration
  - d) None of these

- 7) Direct runoff, is made up of \_\_\_\_\_.  
a) Surface runoff prompt interflow and channel precipitation  
b) Surface runoff, infiltration and evapotranspiration  
c) Overland flow and infiltration  
d) Rainfall and evaporation
- 8) Frequency of Irrigation is dependent upon the type of \_\_\_\_\_.  
a) Soil and crop  
b) Soil and climate  
c) Soil, crop and climate  
d) Soil, crop, climate and fertilizer
- 9) Crop period is the time that crop takes from \_\_\_\_\_.  
a) From first watering to last watering  
b) From sowing to its Harvesting  
c) From sowing to last Harvesting  
d) From first watering before sowing to its Harvesting
- 10) Lift irrigation is a flow \_\_\_\_\_.  
a) By gravity  
b) From low level to higher level  
c) In delta region  
d) Through sprinkler heads
- 11) If the depth is 8.64 cm on a field over a base period of 10 days then duty is \_\_\_\_\_.  
a) 10 ha/cumec  
b) 100 ha/cumec  
c) 864 ha/cumec  
d) 1000 ha/cumec
- 12) The moisture held by the well-drained soil against gravity drainage by the force of surface tension between the soil drains and water drops is called \_\_\_\_\_.  
a) Field capacity water  
b) Hygroscopic water  
c) Capillary water  
d) Water of adhesion
- 13) Crops grown during monsoon month and harvested in October are called as \_\_\_\_\_ Crops.  
a) Rabbi  
b) Kharif  
c) Rabbi and Kharif  
d) Hot weather
- 14) If the duty for a crop with base period 120 days is 1500 Hectares/cumec then its delta is \_\_\_\_\_.  
a) 69.12  
b) 108  
c) 0.6912  
d) None of these

Seat  
No.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

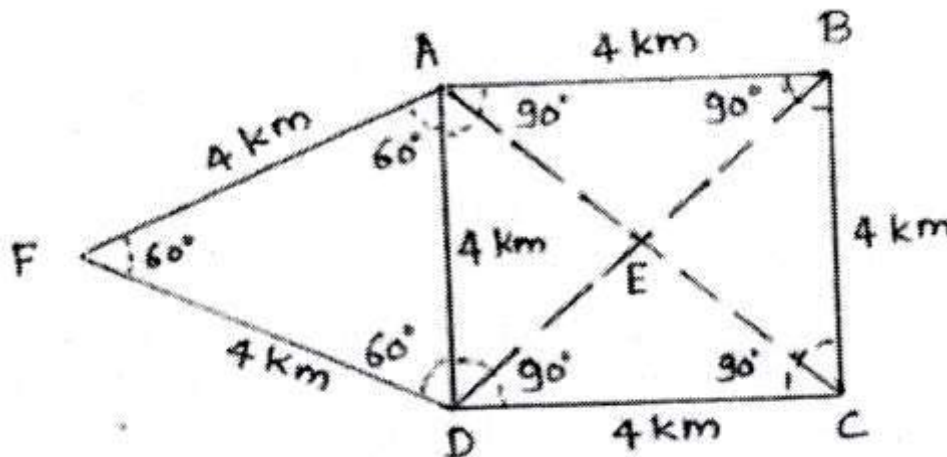
- Instructions:** 1) Q. 2 & Q. 6 are compulsory.  
 2) Attempt any two questions from remaining questions of each section.  
 3) Make suitable assumptions only if necessary. But state them clearly.

**Section – I**

- Q.2 a)** Define infiltration, List the factors that affect the infiltration, Also, explain the working of Ring infiltrometer with sketch. **04**
- b)** Figure shows a typical layout of catchment area ABCDF. Six rain gauge station are established at A B CD E & F as shown in figure precipitation observed at six rain gauge station in July 2021 is as follows. **06**

Station	A	B	C	D	E	F
Precipitation (mm)	100	120	130	180	125	150

Find the average precipitation over the catchment during July - 2021 by Thiessen's polygon method.



- Q.3 a)** What is meant by runoff? Explain methods of separation of Base flow? **04**
- b)** The ordinates of 4 hr UG are given below. Derive the ordinates of 12 hr UG. **05**

Time (hrs)	0	4	8	12	16	20	24	28	32	36	40	44
4Hr. UHO	0	20	80	130	150	130	90	52	27	15	5	0

- Q.4 a)** Define term design flood? List the methods of estimation of flood? Explain any one in detail. **04**
- b)** Estimate the stream flow for the measurement data as given below. **05**

Distance (m)	0	2	4	6	8	10	12	14	16	18	20
Depth (m)	0	0.5	1.2	1.8	2.4	2.6	2.0	1.8	1.6	1	0
Velocity at 0.2 d	0	0.3	0.4	0.6	0.9	1.2	0.9	0.7	0.5	0.3	0
Velocity at 0.8 d	0	0.2	0.3	0.35	0.4	0.45	0.4	0.5	0.4	0.2	0

- Q.5 a)** Discuss Various types of aquifers with reference to ground water availability. **04**
- b)** Diameter of well is 8m. Normal water level is 6 m below G.L. Pumping depresses water level to 16m below GL. 4 hours after stopping pumping water recuperated by 6 m. What is the specific capacity of the well? Find the yield of well for drawdown of 6 m. **05**

### Section – II

- Q.6 a)** After How many days will you supply water to soil (clay Loam), in order to ensure efficient irrigation of the given crop if: **06**
- Field capacity of soil – 27 %
  - Permanent wilting point –14 %
  - Density of soil – 1.5 gm/cm<sup>3</sup>
  - Effective depth of root zone – 75 cm
  - Daily consumptive use of water for a given crop – 11 mm
- b)** What is meant by 'Duty' and 'Delta' of canal water? Develop the relationship between duty and delta for given base period. **04**
- Q.7 a)** What is meant by furrow irrigation and sprinkler irrigation? Which one is preferred in India and Why? **05**
- b)** Discuss the concept of 'Bandhara irrigation system' with its necessity and layout. **04**
- Q.8 a)** Write a note on preparation of land for irrigation. **04**
- b)** Describe with neat sketch, general layout of a lift irrigation scheme. Briefly explain design procedure of lift irrigation scheme. **05**
- Q.9 a)** Discuss the concept of watershed management with reference to soil and water conservation. **05**
- b)** Write a note on canal revenue assessment methods. **04**

<b>Seat No.</b>	
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# Hydrology and Water Resources Engineering

Max. Marks: 70

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### MCQ/Objective Type Questions

Marks: 14

14

- 1) Frequency of Irrigation is dependent upon the type of \_\_\_\_\_.
  - a) Soil and crop
  - b) Soil and climate
  - c) Soil, crop and climate
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- 2) Crop period is the time that crop takes from \_\_\_\_\_.
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  - a) 10 ha/cumec
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- 5) The moisture held by the well-drained soil against gravity drainage by the force of surface tension between the soil drains and water drops is called \_\_\_\_\_.
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  - b) Hygroscopic water
  - c) Capillary water
  - d) Water of adhesion
- 6) Crops grown during monsoon month and harvested in October are called as \_\_\_\_\_ Crops.
  - a) Rabbi
  - b) Kharif
  - c) Rabbi and Kharif
  - d) Hot weather
- 7) If the duty for a crop with base period 120 days is 1500 Hectares/cumec then its delta is \_\_\_\_\_.
  - a) 69.12
  - b) 108
  - c) 0.6912
  - d) None of these

- 8) Catchment area is also known as \_\_\_\_\_.  
a) Watershed area                      b) Drainage Basin  
c) Basin                                      d) All the above
- 9) Evaporation is a \_\_\_\_\_.  
a) Cooling process                      b) Heating process  
c) Combined process                      d) None of above
- 10) Khosla's formula for monthly runoff  $R_m$  due to monthly rainfall  $P_m$  is  $R_m = P_m - L_m$  Where  $L_m$  is \_\_\_\_\_.  
a) a constant  
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- 11) The theory or unit hydrograph was first introduced by \_\_\_\_\_.  
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Seat No.	
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Set **Q**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

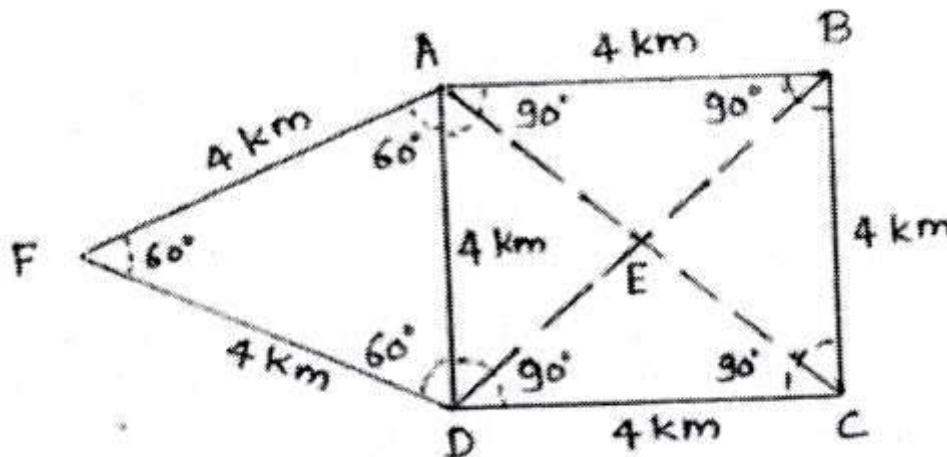
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**Section – I**

- Q.2 a)** Define infiltration, List the factors that affect the infiltration, Also, explain the working of Ring infiltrometer with sketch. **04**
- b)** Figure shows a typical layout of catchment area ABCDF. Six rain gauge station are established at A B CD E & F as shown in figure precipitation observed at six rain gauge station in July 2021 is as follows. **06**

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- b)** The ordinates of 4 hr UG are given below. Derive the ordinates of 12 hr UG. **05**

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Depth (m)	0	0.5	1.2	1.8	2.4	2.6	2.0	1.8	1.6	1	0
Velocity at 0.2 d	0	0.3	0.4	0.6	0.9	1.2	0.9	0.7	0.5	0.3	0
Velocity at 0.8 d	0	0.2	0.3	0.35	0.4	0.45	0.4	0.5	0.4	0.2	0

- Q.5** a) Discuss Various types of aquifers with reference to ground water availability. **04**
- b) Diameter of well is 8m. Normal water level is 6 m below G.L. Pumping depresses water level to 16m below GL. 4 hours after stopping pumping water recuperated by 6 m. What is the specific capacity of the well? Find the yield of well for drawdown of 6 m. **05**

### Section – II

- Q.6** a) After How many days will you supply water to soil (clay Loam), in order to ensure efficient irrigation of the given crop if:  
 i) Field capacity of soil – 27 %  
 ii) Permanent wilting point –14 %  
 iii) Density of soil – 1.5 gm/cm<sup>3</sup>  
 iv) Effective depth of root zone – 75 cm  
 v) Daily consumptive use of water for a given crop – 11 mm **06**
- b) What is meant by 'Duty' and 'Delta' of canal water? Develop the relationship between duty and delta for given base period. **04**
- Q.7** a) What is meant by furrow irrigation and sprinkler irrigation? Which one is preferred in India and Why? **05**
- b) Discuss the concept of 'Bandhara irrigation system' with its necessity and layout. **04**
- Q.8** a) Write a note on preparation of land for irrigation. **04**
- b) Describe with neat sketch, general layout of a lift irrigation scheme. Briefly explain design procedure of lift irrigation scheme. **05**
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- b) Write a note on canal revenue assessment methods. **04**

<b>Seat No.</b>	
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# Hydrology and Water Resources Engineering

Max. Marks: 70

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Marks: 14

14

- 1) If the depth is 8.64 cm on a field over a base period of 10 days then duty is \_\_\_\_\_.  
a) 10 ha/cumec                      b) 100 ha/cumec  
c) 864 ha/cumec                    d) 1000 ha/cumec
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a) Rabbi                                 b) Kharif  
c) Rabbi and Kharif                 d) Hot weather
- 4) If the duty for a crop with base period 120 days is 1500 Hectares/cumec then its delta is \_\_\_\_\_.  
a) 69.12                                 b) 108  
c) 0.6912                                d) None of these
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- 8) The theory of unit hydrograph was first introduced by \_\_\_\_\_.
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  - b) VenTe chow
  - c) Bernard
  - d) L. K. Sherman
- 9) A hyetograph is a plot of \_\_\_\_\_.
  - a) Cumulative rainfall vs time
  - b) Rainfall intensity vs time
  - c) Rainfall depth vs duration
  - d) Discharge vs time
- 10) When the slope of the ground is more than  $16^\circ$ , it has an effect in \_\_\_\_\_.
  - a) Increasing the rate of infiltration
  - b) Reducing the rate of infiltration
  - c) Has no effect on the rate of infiltration
  - d) None of these
- 11) Direct runoff, is made up of \_\_\_\_\_.
  - a) Surface runoff prompt interflow and channel precipitation
  - b) Surface runoff, infiltration and evapotranspiration
  - c) Overland flow and infiltration
  - d) Rainfall and evaporation
- 12) Frequency of Irrigation is dependent upon the type of \_\_\_\_\_.
  - a) Soil and crop
  - b) Soil and climate
  - c) Soil, crop and climate
  - d) Soil, crop, climate and fertilizer
- 13) Crop period is the time that crop takes from \_\_\_\_\_.
  - a) From first watering to last watering
  - b) From sowing to its Harvesting
  - c) From sowing to last Harvesting
  - d) From first watering before sowing to its Harvesting
- 14) Lift irrigation is a flow \_\_\_\_\_.
  - a) By gravity
  - b) From low level to higher level
  - c) In delta region
  - d) Through sprinkler heads

Seat  
No.

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

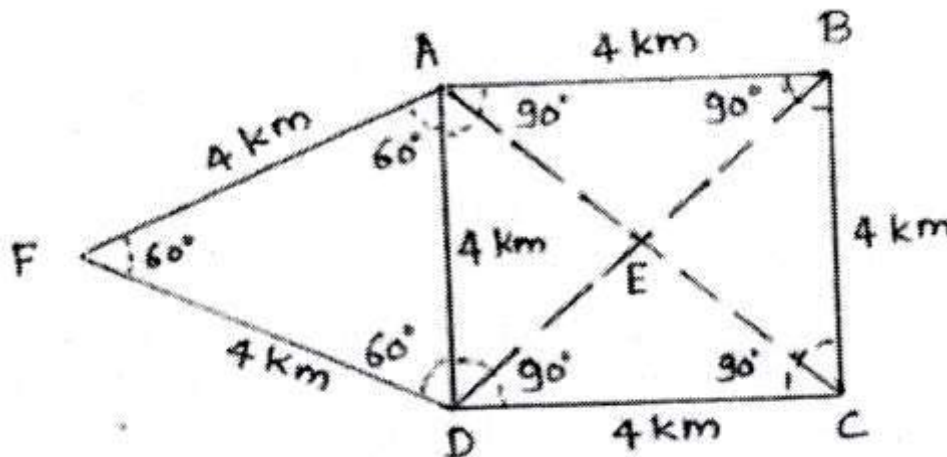
- Instructions:** 1) Q. 2 & Q. 6 are compulsory.  
 2) Attempt any two questions from remaining questions of each section.  
 3) Make suitable assumptions only if necessary. But state them clearly.

**Section – I**

- Q.2** a) Define infiltration, List the factors that affect the infiltration, Also, explain the working of Ring infiltrometer with sketch. **04**
- b) Figure shows a typical layout of catchment area ABCDF. Six rain gauge station are established at A B CD E & F as shown in figure precipitation observed at six rain gauge station in July 2021 is as follows. **06**

Station	A	B	C	D	E	F
Precipitation (mm)	100	120	130	180	125	150

Find the average precipitation over the catchment during July - 2021 by Thiessen's polygon method.



- Q.3** a) What is meant by runoff? Explain methods of separation of Base flow? **04**
- b) The ordinates of 4 hr UG are given below. Derive the ordinates of 12 hr UG. **05**

Time (hrs)	0	4	8	12	16	20	24	28	32	36	40	44
4Hr. UHO	0	20	80	130	150	130	90	52	27	15	5	0

- Q.4 a)** Define term design flood? List the methods of estimation of flood? Explain any one in detail. **04**
- b)** Estimate the stream flow for the measurement data as given below. **05**

Distance (m)	0	2	4	6	8	10	12	14	16	18	20
Depth (m)	0	0.5	1.2	1.8	2.4	2.6	2.0	1.8	1.6	1	0
Velocity at 0.2 d	0	0.3	0.4	0.6	0.9	1.2	0.9	0.7	0.5	0.3	0
Velocity at 0.8 d	0	0.2	0.3	0.35	0.4	0.45	0.4	0.5	0.4	0.2	0

- Q.5 a)** Discuss Various types of aquifers with reference to ground water availability. **04**
- b)** Diameter of well is 8m. Normal water level is 6 m below G.L. Pumping depresses water level to 16m below GL. 4 hours after stopping pumping water recuperated by 6 m. What is the specific capacity of the well? Find the yield of well for drawdown of 6 m. **05**

### Section – II

- Q.6 a)** After How many days will you supply water to soil (clay Loam), in order to ensure efficient irrigation of the given crop if: **06**
- Field capacity of soil – 27 %
  - Permanent wilting point –14 %
  - Density of soil – 1.5 gm/cm<sup>3</sup>
  - Effective depth of root zone – 75 cm
  - Daily consumptive use of water for a given crop – 11 mm
- b)** What is meant by 'Duty' and 'Delta' of canal water? Develop the relationship between duty and delta for given base period. **04**
- Q.7 a)** What is meant by furrow irrigation and sprinkler irrigation? Which one is preferred in India and Why? **05**
- b)** Discuss the concept of 'Bandhara irrigation system' with its necessity and layout. **04**
- Q.8 a)** Write a note on preparation of land for irrigation. **04**
- b)** Describe with neat sketch, general layout of a lift irrigation scheme. Briefly explain design procedure of lift irrigation scheme. **05**
- Q.9 a)** Discuss the concept of watershed management with reference to soil and water conservation. **05**
- b)** Write a note on canal revenue assessment methods. **04**

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) When the slope of the ground is more than  $16^\circ$ , it has an effect in \_\_\_\_\_.  
 a) Increasing the rate of infiltration  
 b) Reducing the rate of infiltration  
 c) Has no effect on the rate of infiltration  
 d) None of these
- 2) Direct runoff, is made up of \_\_\_\_\_.  
 a) Surface runoff prompt interflow and channel precipitation  
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- 3) Frequency of Irrigation is dependent upon the type of \_\_\_\_\_.  
 a) Soil and crop  
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- 4) Crop period is the time that crop takes from \_\_\_\_\_.  
 a) From first watering to last watering  
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 c) From sowing to last Harvesting  
 d) From first watering before sowing to its Harvesting
- 5) Lift irrigation is a flow \_\_\_\_\_.  
 a) By gravity  
 b) From low level to higher level  
 c) In delta region  
 d) Through sprinkler heads
- 6) If the depth is 8.64 cm on a field over a base period of 10 days then duty is \_\_\_\_\_.  
 a) 10 ha/cumec  
 b) 100 ha/cumec  
 c) 864 ha/cumec  
 d) 1000 ha/cumec
- 7) The moisture held by the well-drained soil against gravity drainage by the force of surface tension between the soil drains and water drops is called \_\_\_\_\_.  
 a) Field capacity water  
 b) Hygroscopic water  
 c) Capillary water  
 d) Water of adhesion

- 8) Crops grown during monsoon month and harvested in October are called as \_\_\_\_\_. Crops.
- a) Rabbi
  - b) Kharif
  - c) Rabbi and Kharif
  - d) Hot weather
- 9) If the duty for a crop with base period 120 days is 1500 Hectares/cumec then its delta is \_\_\_\_\_.
- a) 69.12
  - b) 108
  - c) 0.6912
  - d) None of these
- 10) Catchment area is also known as \_\_\_\_\_.
- a) Watershed area
  - b) Drainage Basin
  - c) Basin
  - d) All the above
- 11) Evaporation is a \_\_\_\_\_.
- a) Cooling process
  - b) Heating process
  - c) Combined process
  - d) None of above
- 12) Khosla's formula for monthly runoff  $R_m$  due to monthly rainfall  $P_m$  is  $R_m = P_m - L_m$  Where  $L_m$  is \_\_\_\_\_.
- a) a constant
  - b) monthly loss and depends on the mean monthly catchment temperature
  - c) a monthly loss coefficient depending on the antecedent precipitation index
  - d) a monthly loss depending on the infiltration characteristics of the catchment
- 13) The theory or unit hydrograph was first introduced by \_\_\_\_\_.
- a) Snyder
  - b) VenTe chow
  - c) Bernard
  - d) L. K. Sherman
- 14) A hyetograph is a plot of \_\_\_\_\_.
- a) Cumulative rainfall vs time
  - b) Rainfall intensity vs time
  - c) Rainfall depth vs duration
  - d) Discharge vs time



Seat  
No.

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Tuesday, 07-02-2023  
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Max. Marks: 56

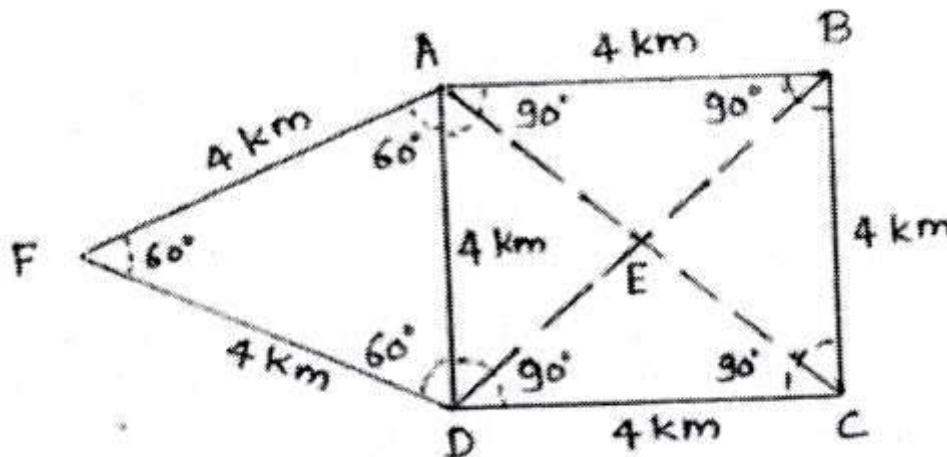
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**Section – I**

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- b)** Figure shows a typical layout of catchment area ABCDF. Six rain gauge station are established at A B CD E & F as shown in figure precipitation observed at six rain gauge station in July 2021 is as follows. **06**

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4Hr. UHO	0	20	80	130	150	130	90	52	27	15	5	0

- Q.4 a)** Define term design flood? List the methods of estimation of flood? Explain any one in detail. **04**
- b)** Estimate the stream flow for the measurement data as given below. **05**

Distance (m)	0	2	4	6	8	10	12	14	16	18	20
Depth (m)	0	0.5	1.2	1.8	2.4	2.6	2.0	1.8	1.6	1	0
Velocity at 0.2 d	0	0.3	0.4	0.6	0.9	1.2	0.9	0.7	0.5	0.3	0
Velocity at 0.8 d	0	0.2	0.3	0.35	0.4	0.45	0.4	0.5	0.4	0.2	0

- Q.5 a)** Discuss Various types of aquifers with reference to ground water availability. **04**
- b)** Diameter of well is 8m. Normal water level is 6 m below G.L. Pumping depresses water level to 16m below GL. 4 hours after stopping pumping water recuperated by 6 m. What is the specific capacity of the well? Find the yield of well for drawdown of 6 m. **05**

### Section – II

- Q.6 a)** After How many days will you supply water to soil (clay Loam), in order to ensure efficient irrigation of the given crop if: **06**
- Field capacity of soil – 27 %
  - Permanent wilting point –14 %
  - Density of soil – 1.5 gm/cm<sup>3</sup>
  - Effective depth of root zone – 75 cm
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- b)** What is meant by 'Duty' and 'Delta' of canal water? Develop the relationship between duty and delta for given base period. **04**
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- Q.8 a)** Write a note on preparation of land for irrigation. **04**
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- Q.9 a)** Discuss the concept of watershed management with reference to soil and water conservation. **05**
- b)** Write a note on canal revenue assessment methods. **04**

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**T.Y. (B. Tech) (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures I**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The maximum stress in compression steel for mild steel is
 

a) $0.87 f_y$	b) $< 0.87 f_y$
c) $f_y$	d) $0.446 f_{ck}$
- 2) The minimum reinforcement when tor steel used is \_\_\_\_\_ of gross area.
 

a) 0.12%	b) 0.15%
c) 0.18%	d) 0.20%
- 3) An RCC beam of 200mm X 300mm effective is subjected to factored shear force 30 kN. The maximum nominal shear stress is \_\_\_\_\_ MPa
 

a) 0.6	b) 0.5
c) 0.4	d) 0.2
- 4) Deflection of doubly reinforced beam are \_\_\_\_\_ compared to singly reinforced beams of same depth
 

a) more	b) less
c) equal	d) none of above
- 5) In LSM total area of stress block is \_\_\_\_\_.
 

a) $0.36 f_{ck} X_u$	b) $0.67 f_{ck} X_u$
c) $1.15 f_{ck} X_u$	d) $0.87 f_{ck} X_u$
- 6) The simple or continuous slabs are analyzed for \_\_\_\_\_.
 

a) Design foundation	b) Design reinforcement
c) Design moments	d) Design slab
- 7) What is assumption in steel beam theory of doubly reinforced beam
 

a) Only steel bar resists tension
b) Only concrete bar resists tension
c) Stress in tension steel equal to stress in compression steel
d) Both concrete and steel resist compression

- Page 2 of 16

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Design of Concrete Structures I**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 5 and Q. 6 are compulsory.  
2) Solve any two questions from remaining questions of each Section.  
3) Use of IS 456 & non programmable calculator is allowed.  
4) Assume suitable data if necessary and mention it clearly.  
5) Draw neat sketches wherever necessary.

**Section – I**

- Q.2** A roof of clear dimensions 4m x 5m supported on walls of 230mm thickness, with corners are held down. All the four edges of the slab are discontinuous. Design the slab, if the beam is carrying a live load of 3.5 kN/m<sup>2</sup>. Use M 20 & Fe 415 steel **09**
- Q.3** A rectangular beam is to be simply supported on support of 250mm width. The clear span of the beam is 5.8m. The beam is having width of 300mm. The super imposed load is 12kN/m. Design the section. Use M 20 & Fe 415 steel **09**
- Q.4** A doubly reinforced beam has width of 250mm & 450mm deep to center of tensile reinforcement. It is reinforced with 2-16mm diameter in compression zone with an effective cover of 50mm & 4-25mm diameter as tensile steel. Find the flexure strength & safe UDL on the simply supported beam of span 6m. Use M20 concrete & Fe 250 steel. **09**
- Q.5** A Tee beam RC floor system consists of 120mm thick slab supported by beams at 3m center to center. The effective width & depth of web 300mm x 580mm. Main reinforcement consists of 8-20mm diameter. The grade of concrete & steel used are M20 & Fe415 grade respectively. Determine the moment of resistance of Tee beam if it used as simply supported beam of span 3.6m. **10**

**Section – II**

- Q.6** Design a rectangular beam of effective spans 7m to carry a dead load of 10 kN/m & live load of 12 kN/m. The beam is continuous over 3 spans & is supported by columns. Use M20 concrete & Fe 415 steel. **10**
- Q.7** Determine the reinforcement required for beam size 300mm x 600mm subjected to a factored bending moment 120 kNm, a factored shear force 90 kN & a factored torsion moment of 50 kNm. Use M 20 concrete & Fe 415 steel. **09**
- Q.8** A short column 400mm x 400mm is provided with 8-16mm diameter, if the length of column is 2.25m. It is effectively held in position at both ends & restrained against rotation at one end. Find ultimate load for column. Use M20 & Fe415. **09**

- Q.9** Design a circular column with helical reinforcement to carry an axial load of 1800 kN. The column has spiral ties. The column is 3.2m long & is effectively held in at both ends, but not restrained against rotation.  
Use M 25 concrete & Fe 500 steel.

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**T.Y. (B. Tech) (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures I**

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A 12m long R.C T-beam is spaced at 3.25m with web of 0.4m wide and 1m deep, supports flange slab of 100mm thick. The effective flange width of beam will be
 

a) 3 m	b) 3.25 m
c) 2.5 m	d) 2 m
- 2) Force on 300mm x 500 mm deep beam, subjected to shear force of 150 kN and torsion 30 kNm, then equivalent shear is
 

a) 80 kN	b) 246 kN
c) 210 kN	d) 310 kN
- 3) In effective width of flange formula  $L_o$  defined as distance between points of zero Moment is considered due to
 

a) Within $L_o$ stresses are uniform
b) Strain compatibility
c) Beyond $L_o$ , flange will be in tension and ineffective
d) None of above
- 4) What is the recommended value of effective length if the column is effectively held in position and fixed against rotation in both ends
 

a) 0.81	b) 0.51
c) 0.651	d) 0.911
- 5) The strength of the column with helical reinforcement shall \_\_\_\_ be times the strength of similar column with lateral ties.
 

a) 2.0	b) 1.05
c) 3.0	d) 1.5
- 6) An RCC column can have maximum tension reinforcement is \_\_\_\_\_.
 

a) 6% bD	b) 2% bD
c) 3% bD	d) 4% bD
- 7) Torsion effect is significant in case of \_\_\_\_\_.
 

a) Lintel Beam	b) T Beam
c) L beam	d) Cantilever beam

- Page 6 of 16



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures I**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 5 and Q. 6 are compulsory.  
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Use M 25 concrete & Fe 500 steel.

Seat No.	
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**T.Y. (B. Tech) (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures I**

Day & Date: Thursday, 09-02-2023  
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a) $0.87 f_y$	b) $< 0.87 f_y$
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a)  $0.36 f_{ck} X_u$                       b)  $0.67 f_{ck} X_u$   
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a) Design foundation                      b) Design reinforcement  
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<b>Seat No.</b>	
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**T.Y. (B. Tech) (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures I**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

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- Instructions:** 1) Q. 5 and Q. 6 are compulsory.  
 2) Solve any two questions from remaining questions of each Section.  
 3) Use of IS 456 & non programmable calculator is allowed.  
 4) Assume suitable data if necessary and mention it clearly.  
 5) Draw neat sketches wherever necessary.

**Section – I**

- Q.2** A roof of clear dimensions 4m x 5m supported on walls of 230mm thickness, with corners are held down. All the four edges of the slab are discontinuous. Design the slab, if the beam is carrying a live load of 3.5 kN/m<sup>2</sup>. Use M 20 & Fe 415 steel **09**
- Q.3** A rectangular beam is to be simply supported on support of 250mm width. The clear span of the beam is 5.8m. The beam is having width of 300mm. The super imposed load is 12kN/m. Design the section. Use M 20 & Fe 415 steel **09**
- Q.4** A doubly reinforced beam has width of 250mm & 450mm deep to center of tensile reinforcement. It is reinforced with 2-16mm diameter in compression zone with an effective cover of 50mm & 4-25mm diameter as tensile steel. Find the flexure strength & safe UDL on the simply supported beam of span 6m. Use M20 concrete & Fe 250 steel. **09**
- Q.5** A Tee beam RC floor system consists of 120mm thick slab supported by beams at 3m center to center. The effective width & depth of web 300mm x 580mm. Main reinforcement consists of 8-20mm diameter. The grade of concrete & steel used are M20 & Fe415 grade respectively. Determine the moment of resistance of Tee beam if it used as simply supported beam of span 3.6m. **10**

**Section – II**

- Q.6** Design a rectangular beam of effective spans 7m to carry a dead load of 10 kN/m & live load of 12 kN/m. The beam is continuous over 3 spans & is supported by columns. Use M20 concrete & Fe 415 steel. **10**
- Q.7** Determine the reinforcement required for beam size 300mm x 600mm subjected to a factored bending moment 120 kNm, a factored shear force 90 kN & a factored torsion moment of 50 kNm. Use M 20 concrete & Fe 415 steel. **09**
- Q.8** A short column 400mm x 400mm is provided with 8-16mm diameter, if the length of column is 2.25m. It is effectively held in position at both ends & restrained against rotation at one end. Find ultimate load for column. Use M20 & Fe415. **09**

- Q.9** Design a circular column with helical reinforcement to carry an axial load of 1800 kN. The column has spiral ties. The column is 3.2m long & is effectively held in at both ends, but not restrained against rotation.  
Use M 25 concrete & Fe 500 steel.

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures I**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The simple or continuous slabs are analyzed for \_\_\_\_\_.  
 a) Design foundation                      b) Design reinforcement  
 c) Design moments                         d) Design slab
- 2) What is assumption in steel beam theory of doubly reinforced beam  
 a) Only steel bar resists tension  
 b) Only concrete bar resists tension  
 c) Stress in tension steel equal to stress in compression steel  
 d) Both concrete and steel resist compression
- 3) A 12m long R.C T-beam is spaced at 3.25m with web of 0.4m wide and 1m deep, supports flange slab of 100mm thick. The effective flange width of beam will be  
 a) 3 m    b) 3.25 m  
 c) 2.5 m    d) 2 m
- 4) Force on 300mm x 500 mm deep beam, subjected to shear force of 150 kN and torsion 30 kNm, then equivalent shear is  
 a) 80 kN     b) 246 kN  
 c) 210 kN     d) 310 kN
- 5) In effective width of flange formula  $L_o$  defined as distance between points of zero Moment is considered due to  
 a) Within  $L_o$  stresses are uniform  
 b) Strain compatibility  
 c) Beyond  $L_o$ , flange will be in tension and ineffective  
 d) None of above
- 6) What is the recommended value of effective length if the column is effectively held in position and fixed against rotation in both ends  
 a) 0.81    b) 0.51  
 c) 0.651    d) 0.911

- Page 14 of 16



<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Design of Concrete Structures I**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 5 and Q. 6 are compulsory.  
2) Solve any two questions from remaining questions of each Section.  
3) Use of IS 456 & non programmable calculator is allowed.  
4) Assume suitable data if necessary and mention it clearly.  
5) Draw neat sketches wherever necessary.

**Section – I**

- Q.2** A roof of clear dimensions 4m x 5m supported on walls of 230mm thickness, with corners are held down. All the four edges of the slab are discontinuous. Design the slab, if the beam is carrying a live load of 3.5 kN/m<sup>2</sup>. Use M 20 & Fe 415 steel **09**
- Q.3** A rectangular beam is to be simply supported on support of 250mm width. The clear span of the beam is 5.8m. The beam is having width of 300mm. The super imposed load is 12kN/m. Design the section. Use M 20 & Fe 415 steel **09**
- Q.4** A doubly reinforced beam has width of 250mm & 450mm deep to center of tensile reinforcement. It is reinforced with 2-16mm diameter in compression zone with an effective cover of 50mm & 4-25mm diameter as tensile steel. Find the flexure strength & safe UDL on the simply supported beam of span 6m. Use M20 concrete & Fe 250 steel. **09**
- Q.5** A Tee beam RC floor system consists of 120mm thick slab supported by beams at 3m center to center. The effective width & depth of web 300mm x 580mm. Main reinforcement consists of 8-20mm diameter. The grade of concrete & steel used are M20 & Fe415 grade respectively. Determine the moment of resistance of Tee beam if it used as simply supported beam of span 3.6m. **10**

**Section – II**

- Q.6** Design a rectangular beam of effective spans 7m to carry a dead load of 10 kN/m & live load of 12 kN/m. The beam is continuous over 3 spans & is supported by columns. Use M20 concrete & Fe 415 steel. **10**
- Q.7** Determine the reinforcement required for beam size 300mm x 600mm subjected to a factored bending moment 120 kNm, a factored shear force 90 kN & a factored torsion moment of 50 kNm. Use M 20 concrete & Fe 415 steel. **09**
- Q.8** A short column 400mm x 400mm is provided with 8-16mm diameter, if the length of column is 2.25m. It is effectively held in position at both ends & restrained against rotation against rotation at one end. Find ultimate load for column. Use M20 & Fe415. **09**

- Q.9** Design a circular column with helical reinforcement to carry an axial load of 1800 kN. The column has spiral ties. The column is 3.2m long & is effectively held in at both ends, but not restrained against rotation.  
Use M 25 concrete & Fe 500 steel.

Seat No.	
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Set	P
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Sewage treatment units are generally designed for \_\_\_\_\_.  
 a) Maximum Flow only                      b) Minimum Flow only  
 c) Average Flow only                      d) Both a) and b)
- 2) Detention period for Grit Chamber is \_\_\_\_\_.  
 a) 1 minute                                      b) 2-4 hours  
 c) 5-7 hours                                      d) None of these
- 3) Activated Sludge is the \_\_\_\_\_.  
 a) Aerated sludge in Aeration Unit  
 b) Settled Sludge in the humus tank  
 c) Sludge in secondary tank, rich in microbial mass  
 d) Sludge in secondary tank, rich in nutrients
- 4) Low F/M ratio in ASP means \_\_\_\_\_.  
 a) Lower BOD Removal                      b) Higher BOD Removal  
 c) No Effect                                      d) None of the above
- 5) Amount of DO% present in the zone of active decomposition, is \_\_\_\_\_.  
 a) < 40    b) 40 - 50  
 c) 50 - 100                                      d) > 100
- 6) The Root Zone Technology is used to remove \_\_\_\_\_.  
 a) Heavy metals                                      b) Organic matter  
 c) Pathogens                                      d) All of above
- 7) The Stable atmospheric condition is \_\_\_\_\_ for dispersion process.  
 a) Favorable                                      b) Unfavorable  
 c) both a) and b)                                      d) None of the above
- 8) \_\_\_\_\_ Property/ properties of MSW is/are for landfill design.  
 a) Permeability                                      b) Density  
 c) Field capacity                                      d) All of above

- 9) \_\_\_\_\_ is ultimate disposal option considered in Municipal Solid Waste (MSW) management.
- |               |                 |
|---------------|-----------------|
| a) Landfill   | b) Incineration |
| c) Composting | d) Open burning |
- 10) Bacterial-algal-symbiosis is observed in \_\_\_\_\_.
- |                            |                    |
|----------------------------|--------------------|
| a) Aerated lagoon          | b) Oxidation ditch |
| c) Aerobic oxidation ponds | d) Anaerobic ponds |
- 11) \_\_\_\_\_ solves problem of air pollution but creates problem of water pollution.
- |            |              |
|------------|--------------|
| a) ESP     | b) Bag house |
| c) Cyclone | d) Scrubbers |
- 12) The anaerobic method of mechanical composting as prescribed in India, is called the \_\_\_\_\_.
- |                     |                     |
|---------------------|---------------------|
| a) Indore method    | b) Mangalore method |
| c) Bangalore method | d) None of these    |
- 13) Which gas is mainly produced due to burning of petrol?
- |                    |                    |
|--------------------|--------------------|
| a) CO              | b) SO <sub>2</sub> |
| c) NO <sub>2</sub> | d) NO <sub>3</sub> |
- 14) Paper waste is considered as \_\_\_\_\_.
- |                                      |
|--------------------------------------|
| a) Garbage                           |
| b) Rubbish                           |
| c) Construction and demolition waste |
| d) All of above                      |

Seat No.	
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Set

P

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering - II**

Day &amp; Date: Tuesday, 14-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:**
- 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
  - 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever necessary and mention it clearly.
  - 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2**
- a) A town has a population of 1,50,000 persons with per capita water supply of 200 litres/day. Assuming 85% of water usage is appears to be sewage, design a sewer running 0.7 times full at maximum discharge. Take a constant value of  $N = 0.013$  at all depths of flow. The sewer is to be laid at a slope of 1 in 500. Take a peak factor of 3. **06**
  - b) Explain dry weather flow with a neat diagram. Explain various factors affecting dry weather flow. **04**
- Q.3**
- a) The BOD of a sewage incubated for one day at  $27^{\circ}\text{C}$  has been found to be 160 mg/L. What will be the 2- day  $20^{\circ}\text{C}$  BOD. Assume  $K = 0.2$  (Base 10) at  $20^{\circ}\text{C}$ . **05**
  - b) Explain Tricking filter in wastewater treatment plant with neat diagram. **04**
- Q.4**
- a) Explain grit chamber in WWTP with a neat diagram. Enlist design criteria of the same. **05**
  - b) Write short note on aerobic process with a typical sketch. **04**
- Q.5** Write short notes on following (any three): **09**
- a) Sludge Volume Index
  - b) Hydraulic Retention time & F/ M Ratio
  - c) Types of Screens
  - d) Skimming Tank

**Section - II**

- Q.6**
- a) Differentiate between primary and secondary air pollutants. **05**
  - b) Using the following data, find out DO at the end of 1 & 2 days, **05**

Parameters	River	Wastewater
Flow ( $\text{m}^3/\text{s}$ )	25	2
DO ( $\text{mg/L}$ )	9.1	0
5 day BOD ( $\text{mg/L}$ )	2.0	200

Take Deoxygenation constant, as 0.10 per day (base e) & re-oxygenation constant as 0.30 per day (base e). Take saturation DO as 9.10 mg/L

- Q.7**   **a)**   Describe bag filters with neat diagram. **05**  
          **b)**   Discuss the advantages and disadvantages of incineration. **04**
- Q.8**   **a)**   Illustrate the factors responsible for the rate of solid waste generation. **05**  
          **b)**   Discuss the characteristics of 'hazardous waste' as per CPCB guidelines. **04**
- Q.9**   **Write short notes on following (any three):** **09**  
          **a)**   Composting  
          **b)**   Lapse Rate  
          **c)**   ESP  
          **d)**   Streeter Phelps's Equation

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ Property/ properties of MSW is/are for landfill design.
 

a) Permeability	b) Density
c) Field capacity	d) All of above
- 2) \_\_\_\_\_ is ultimate disposal option considered in Municipal Solid Waste (MSW) management.
 

a) Landfill	b) Incineration
c) Composting	d) Open burning
- 3) Bacterial-algal-symbiosis is observed in \_\_\_\_\_.
 

a) Aerated lagoon	b) Oxidation ditch
c) Aerobic oxidation ponds	d) Anaerobic ponds
- 4) \_\_\_\_\_ solves problem of air pollution but creates problem of water pollution.
 

a) ESP	b) Bag house
c) Cyclone	d) Scrubbers
- 5) The anaerobic method of mechanical composting as prescribed in India, is called the \_\_\_\_\_.
 

a) Indore method	b) Mangalore method
c) Bangalore method	d) None of these
- 6) Which gas is mainly produced due to burning of petrol?
 

a) CO	b) SO <sub>2</sub>
c) NO <sub>2</sub>	d) NO <sub>3</sub>
- 7) Paper waste is considered as \_\_\_\_\_.
 

a) Garbage	
b) Rubbish	
c) Construction and demolition waste	
d) All of above	
- 8) Sewage treatment units are generally designed for \_\_\_\_\_.
 

a) Maximum Flow only	b) Minimum Flow only
c) Average Flow only	d) Both a) and b)

- 9) Retention period for Grit Chamber is \_\_\_\_\_.
  - a) 1 minute
  - b) 2-4 hours
  - c) 5-7 hours
  - d) None of these
- 10) Activated Sludge is the \_\_\_\_\_.
  - a) Aerated sludge in Aeration Unit
  - b) Settled Sludge in the humus tank
  - c) Sludge in secondary tank, rich in microbial mass
  - d) Sludge in secondary tank, rich in nutrients
- 11) Low F/M ratio in ASP means \_\_\_\_\_.
  - a) Lower BOD Removal
  - b) Higher BOD Removal
  - c) No Effect
  - d) None of the above
- 12) Amount of DO% present in the zone of active decomposition, is \_\_\_\_\_.
  - a) < 40
  - b) 40 - 50
  - c) 50 - 100
  - d) > 100
- 13) The Root Zone Technology is used to remove \_\_\_\_\_.
  - a) Heavy metals
  - b) Organic matter
  - c) Pathogens
  - d) All of above
- 14) The Stable atmospheric condition is \_\_\_\_\_ for dispersion process.
  - a) Favorable
  - b) Unfavorable
  - c) both a) and b)
  - d) None of the above



Seat No.	
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Set Q
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:**
- 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
  - 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever necessary and mention it clearly.
  - 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2**
- a) A town has a population of 1,50,000 persons with per capita water supply of 200 litres/day. Assuming 85% of water usage is appears to be sewage, design a sewer running 0.7 times full at maximum discharge. Take a constant value of  $N = 0.013$  at all depths of flow. The sewer is to be laid at a slope of 1 in 500. Take a peak factor of 3. **06**
  - b) Explain dry weather flow with a neat diagram. Explain various factors affecting dry weather flow. **04**
- Q.3**
- a) The BOD of a sewage incubated for one day at  $27^{\circ}\text{C}$  has been found to be 160 mg/L. What will be the 2- day  $20^{\circ}\text{C}$  BOD. Assume  $K = 0.2$  (Base 10) at  $20^{\circ}\text{C}$ . **05**
  - b) Explain Tricking filter in wastewater treatment plant with neat diagram. **04**
- Q.4**
- a) Explain grit chamber in WWTP with a neat diagram. Enlist design criteria of the same. **05**
  - b) Write short note on aerobic process with a typical sketch. **04**
- Q.5** Write short notes on following (any three): **09**
- a) Sludge Volume Index
  - b) Hydraulic Retention time & F/ M Ratio
  - c) Types of Screens
  - d) Skimming Tank

**Section - II**

- Q.6**
- a) Differentiate between primary and secondary air pollutants. **05**
  - b) Using the following data, find out DO at the end of 1 & 2 days, **05**

Parameters	River	Wastewater
Flow ( $\text{m}^3/\text{s}$ )	25	2
DO ( $\text{mg/L}$ )	9.1	0
5 day BOD ( $\text{mg/L}$ )	2.0	200

Take Deoxygenation constant, as 0.10 per day (base e) & re-oxygenation constant as 0.30 per day (base e). Take saturation DO as 9.10 mg/L

- Q.7**   **a)**   Describe bag filters with neat diagram. **05**  
         **b)**   Discuss the advantages and disadvantages of incineration. **04**
- Q.8**   **a)**   Illustrate the factors responsible for the rate of solid waste generation. **05**  
         **b)**   Discuss the characteristics of 'hazardous waste' as per CPCB guidelines. **04**
- Q.9**   **Write short notes on following (any three):** **09**  
         **a)**   Composting  
         **b)**   Lapse Rate  
         **c)**   ESP  
         **d)**   Streeter Phelps's Equation

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ solves problem of air pollution but creates problem of water pollution.
 

a) ESP	b) Bag house
c) Cyclone	d) Scrubbers
- 2) The anaerobic method of mechanical composting as prescribed in India, is called the \_\_\_\_\_.
 

a) Indore method	b) Mangalore method
c) Bangalore method	d) None of these
- 3) Which gas is mainly produced due to burning of petrol?
 

a) CO	b) SO <sub>2</sub>
c) NO <sub>2</sub>	d) NO <sub>3</sub>
- 4) Paper waste is considered as \_\_\_\_\_.
 

a) Garbage	
b) Rubbish	
c) Construction and demolition waste	
d) All of above	
- 5) Sewage treatment units are generally designed for \_\_\_\_\_.
 

a) Maximum Flow only	b) Minimum Flow only
c) Average Flow only	d) Both a) and b)
- 6) Detention period for Grit Chamber is \_\_\_\_\_.
 

a) 1 minute	b) 2-4 hours
c) 5-7 hours	d) None of these
- 7) Activated Sludge is the \_\_\_\_\_.
 

a) Aerated sludge in Aeration Unit	
b) Settled Sludge in the humus tank	
c) Sludge in secondary tank, rich in microbial mass	
d) Sludge in secondary tank, rich in nutrients	
- 8) Low F/M ratio in ASP means \_\_\_\_\_.
 

a) Lower BOD Removal	b) Higher BOD Removal
c) No Effect	d) None of the above



Seat No.	
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Set **R**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:**
- 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
  - 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever necessary and mention it clearly.
  - 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2**
- a) A town has a population of 1,50,000 persons with per capita water supply of 200 litres/day. Assuming 85% of water usage is appears to be sewage, design a sewer running 0.7 times full at maximum discharge. Take a constant value of  $N = 0.013$  at all depths of flow. The sewer is to be laid at a slope of 1 in 500. Take a peak factor of 3. **06**
  - b) Explain dry weather flow with a neat diagram. Explain various factors affecting dry weather flow. **04**
- Q.3**
- a) The BOD of a sewage incubated for one day at  $27^{\circ}\text{C}$  has been found to be 160 mg/L. What will be the 2- day  $20^{\circ}\text{C}$  BOD. Assume  $K = 0.2$  (Base 10) at  $20^{\circ}\text{C}$ . **05**
  - b) Explain Tricking filter in wastewater treatment plant with neat diagram. **04**
- Q.4**
- a) Explain grit chamber in WWTP with a neat diagram. Enlist design criteria of the same. **05**
  - b) Write short note on aerobic process with a typical sketch. **04**
- Q.5** Write short notes on following (any three): **09**
- a) Sludge Volume Index
  - b) Hydraulic Retention time & F/ M Ratio
  - c) Types of Screens
  - d) Skimming Tank

**Section - II**

- Q.6**
- a) Differentiate between primary and secondary air pollutants. **05**
  - b) Using the following data, find out DO at the end of 1 & 2 days, **05**

Parameters	River	Wastewater
Flow ( $\text{m}^3/\text{s}$ )	25	2
DO ( $\text{mg/L}$ )	9.1	0
5 day BOD ( $\text{mg/L}$ )	2.0	200

Take Deoxygenation constant, as 0.10 per day (base e) & re-oxygenation constant as 0.30 per day (base e). Take saturation DO as 9.10 mg/L

- Q.7**   **a)**   Describe bag filters with neat diagram. **05**  
         **b)**   Discuss the advantages and disadvantages of incineration. **04**
- Q.8**   **a)**   Illustrate the factors responsible for the rate of solid waste generation. **05**  
         **b)**   Discuss the characteristics of 'hazardous waste' as per CPCB guidelines. **04**
- Q.9**   **Write short notes on following (any three):** **09**  
         **a)**   Composting  
         **b)**   Lapse Rate  
         **c)**   ESP  
         **d)**   Streeter Phelps's Equation

<b>Seat No.</b>	
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Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- The Root Zone Technology is used to remove \_\_\_\_\_.
  - Heavy metals
  - Organic matter
  - Pathogens
  - All of above
- The Stable atmospheric condition is \_\_\_\_\_ for dispersion process.
  - Favorable
  - Unfavorable
  - both a) and b)
  - None of the above
- \_\_\_\_\_ Property/ properties of MSW is/are for landfill design.
  - Permeability
  - Density
  - Field capacity
  - All of above
- \_\_\_\_\_ is ultimate disposal option considered in Municipal Solid Waste (MSW) management.
  - Landfill
  - Incineration
  - Composting
  - Open burning
- Bacterial-algal-symbiosis is observed in \_\_\_\_\_.
  - Aerated lagoon
  - Oxidation ditch
  - Aerobic oxidation ponds
  - Anaerobic ponds
- \_\_\_\_\_ solves problem of air pollution but creates problem of water pollution.
  - ESP
  - Bag house
  - Cyclone
  - Scrubbers
- The anaerobic method of mechanical composting as prescribed in India, is called the \_\_\_\_\_.
  - Indore method
  - Mangalore method
  - Bangalore method
  - None of these
- Which gas is mainly produced due to burning of petrol?
  - CO
  - SO<sub>2</sub>
  - NO<sub>2</sub>
  - NO<sub>3</sub>

- 9) Paper waste is considered as \_\_\_\_\_.  
a) Garbage  
b) Rubbish  
c) Construction and demolition waste  
d) All of above
- 10) Sewage treatment units are generally designed for \_\_\_\_\_.  
a) Maximum Flow only                      b) Minimum Flow only  
c) Average Flow only                      d) Both a) and b)
- 11) Detention period for Grit Chamber is \_\_\_\_\_.  
a) 1 minute                                      b) 2-4 hours  
c) 5-7 hours                                      d) None of these
- 12) Activated Sludge is the \_\_\_\_\_.  
a) Aerated sludge in Aeration Unit  
b) Settled Sludge in the humus tank  
c) Sludge in secondary tank, rich in microbial mass  
d) Sludge in secondary tank, rich in nutrients
- 13) Low F/M ratio in ASP means \_\_\_\_\_.  
a) Lower BOD Removal                      b) Higher BOD Removal  
c) No Effect                                      d) None of the above
- 14) Amount of DO% present in the zone of active decomposition, is \_\_\_\_\_.  
a) < 40    b) 40 - 50  
c) 50 - 100    d) > 100



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:**
- 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
  - 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever necessary and mention it clearly.
  - 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2**
- a) A town has a population of 1,50,000 persons with per capita water supply of 200 litres/day. Assuming 85% of water usage is appears to be sewage, design a sewer running 0.7 times full at maximum discharge. Take a constant value of  $N = 0.013$  at all depths of flow. The sewer is to be laid at a slope of 1 in 500. Take a peak factor of 3. **06**
  - b) Explain dry weather flow with a neat diagram. Explain various factors affecting dry weather flow. **04**
- Q.3**
- a) The BOD of a sewage incubated for one day at  $27^{\circ}\text{C}$  has been found to be 160 mg/L. What will be the 2- day  $20^{\circ}\text{C}$  BOD. Assume  $K = 0.2$  (Base 10) at  $20^{\circ}\text{C}$ . **05**
  - b) Explain Tricking filter in wastewater treatment plant with neat diagram. **04**
- Q.4**
- a) Explain grit chamber in WWTP with a neat diagram. Enlist design criteria of the same. **05**
  - b) Write short note on aerobic process with a typical sketch. **04**
- Q.5** Write short notes on following (any three): **09**
- a) Sludge Volume Index
  - b) Hydraulic Retention time & F/ M Ratio
  - c) Types of Screens
  - d) Skimming Tank

**Section - II**

- Q.6**
- a) Differentiate between primary and secondary air pollutants. **05**
  - b) Using the following data, find out DO at the end of 1 & 2 days, **05**

Parameters	River	Wastewater
Flow ( $\text{m}^3/\text{s}$ )	25	2
DO ( $\text{mg/L}$ )	9.1	0
5 day BOD ( $\text{mg/L}$ )	2.0	200

Take Deoxygenation constant, as 0.10 per day (base e) & re-oxygenation constant as 0.30 per day (base e). Take saturation DO as 9.10 mg/L

- |            |  |  |           |
|------------|--|--|-----------|
| <b>Q.7</b> | <b>a)</b>  | Describe bag filters with neat diagram.                                    | <b>05</b> |
|            | <b>b)</b>  | Discuss the advantages and disadvantages of incineration.                  | <b>04</b> |
| <b>Q.8</b> | <b>a)</b>  | Illustrate the factors responsible for the rate of solid waste generation. | <b>05</b> |
|            | <b>b)</b>  | Discuss the characteristics of 'hazardous waste' as per CPCB guidelines.   | <b>04</b> |
| <b>Q.9</b> | <b>Write short notes on following (any three):</b> |  | <b>09</b> |
|            | <b>a)</b>  | Composting   |           |
|            | <b>b)</b>  | Lapse Rate   |           |
|            | <b>c)</b>  | ESP  |           |
|            | <b>d)</b>  | Streeter Phelps's Equation   |           |

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Risk Assessment and Vulnerability Analysis**

Day & Date: Thursday 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Production and use of harmful chemicals is under ban in \_\_\_\_\_ countries.  
a) Developing countries                      b) Developed countries  
c) Third world countries                      d) All of these
- 2) Which of the following groups of people is more vulnerable in the event of disaster?  
a) Men, boys, old people                      b) Men, women, boys  
c) Women, children, old people                      d) None of the above
- 3) The extent to which a community, structure, services or geographic area is likely to be damaged or disrupted by the impact of particular hazard is termed as  
a) Capacity    b) Vulnerability  
c) Risk    d) Hazard assessment
- 4) Vulnerability analysis comes in which part of the Disaster Management Cycle  
a) Mitigation    b) Preparedness  
c) Response    d) Recovery
- 5) Disaster Management includes:  
a) Mitigation    b) Reconstruction  
c) Rehabilitation    d) All of the above
- 6) Which of the following is considered as objective of disaster management?  
a) Dispose dead bodies  
b) Supplying of essential commodities  
c) Rehabilitation of disaster victims  
d) All of these
- 7) The role of which agency is important in disaster prevention.  
a) Media    b) Police  
c) Government official    d) Public

- 8) What are the important measure to be taken in community level of disaster preparedness
- a) Increased awareness
  - b) Provision of early and timely warning
  - c) Land use planning
  - d) All of the above
- 9) What are the major types oriented to mitigation measures of hazards and disasters?
- a) Public mitigation measures
  - b) Community mitigation measures
  - c) Both a and b
  - d) None of the above
- 10) Disaster management is aimed at-
- a) Resettling people in the closest unaffected urban area
  - b) Collection of valuable data for future management objectives
  - c) Strengthening sewage and drinking water treatment facilities to resist the impact of a future disaster
  - d) Restoring communities' services, facilities, and residences to pre-disaster levels
- 11) Structural and Non-structural measures are elements of high category of Risk Reduction measures
- a) Socio-economic measures
  - b) Physical measures
  - c) Environmental measures
  - d) Post disaster measures
- 12) Rehabilitation is the priority of which of the following phase?
- a) Phase of emergency
  - b) Transitional Phase
  - c) Reconstruction Phase
  - d) Mock drill
- 13) What is it called when a large number of people in a community get a disease at the same time?
- a) Influx
  - b) Black death
  - c) Epidemic
  - d) Pandemic
- 14) The cycle of disaster consists of the following components
- a) Mitigation, Preparedness, Response, Recovery
  - b) Preparedness, vulnerability assessment, risk assessment, recovery
  - c) Mitigation, Risk assessment, Response and Recovery
  - d) None of the above

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Risk Assessment and Vulnerability Analysis**

Day & Date: Thursday 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Solve any two questions from Section – I out of Q.2, Q.3 & Q.4  
 2) Solve any two Questions from Section – II out of Q.5, Q.6 & Q.7  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

- Q.2** a) What are the different elements of Risk? Explain in detail. **07**  
 b) Define: **07**  
     i) Risk  
     ii) Vulnerability  
     iii) Hazard  
     iv) Disasters
- Q.3** a) Explain various problems involved in the risk assessment process. **07**  
 b) Explain participatory risk assessment methods. **07**
- Q.4** a) Explain different social and economic factors of vulnerability. **07**  
 b) Explain vulnerability in the city and different risks in urban areas. **07**

**Section – II**

- Q.5** a) Explain hazard resistant design and construction. **07**  
 b) Write a note on systematic management and strategic planning for vulnerability reduction. **07**
- Q.6** a) Explain the role of information and communication technology in health response. **07**  
 b) Explain the role of education and training in Health management of disaster. **07**
- Q.7** a) Explain uses of remote sensing techniques in disaster preparedness. **07**  
 b) What are emerging techniques in disaster preparedness? Enlist all the techniques **07**

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022  
CIVIL ENGINEERING**

**Risk Assessment and Vulnerability Analysis**

Day & Date: Thursday 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What are the important measure to be taken in community level of disaster preparedness
  - a) Increased awareness
  - b) Provision of early and timely warning
  - c) Land use planning
  - d) All of the above
- 2) What are the major types oriented to mitigation measures of hazards and disasters?
  - a) Public mitigation measures
  - b) Community mitigation measures
  - c) Both a and b
  - d) None of the above
- 3) Disaster management is aimed at-
  - a) Resettling people in the closest unaffected urban area
  - b) Collection of valuable data for future management objectives
  - c) Strengthening sewage and drinking water treatment facilities to resist the impact of a future disaster
  - d) Restoring communities' services, facilities, and residences to pre-disaster levels
- 4) Structural and Non-structural measures are elements of high category of Risk Reduction measures
 

a) Socio-economic measures	b) Physical measures
c) Environmental measures	d) Post disaster measures
- 5) Rehabilitation is the priority of which of the following phase?
 

a) Phase of emergency	b) Transitional Phase
c) Reconstruction Phase	d) Mock dill
- 6) What is it called when a large number of people in a community get a disease at the same time?
 

a) Influx	b) Black death
c) Epidemic	d) Pandemic

- 7) The cycle of disaster consists of the following components
- a) Mitigation, Preparedness, Response, Recovery
  - b) Preparedness, vulnerability assessment, risk assessment, recovery
  - c) Mitigation, Risk assessment, Response and Recovery
  - d) None of the above
- 8) Production and use of harmful chemicals is under ban in \_\_\_\_\_ countries.
- a) Developing countries
  - b) Developed countries
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  - d) All of these
- 9) Which of the following groups of people is more vulnerable in the event of disaster?
- a) Men, boys, old people
  - b) Men, women, boys
  - c) Women, children, old people
  - d) None of the above
- 10) The extent to which a community, structure, services or geographic area is likely to be damaged or disrupted by the impact of particular hazard is termed as
- a) Capacity
  - b) Vulnerability
  - c) Risk
  - d) Hazard assessment
- 11) Vulnerability analysis comes in which part of the Disaster Management Cycle
- a) Mitigation
  - b) Preparedness
  - c) Response
  - d) Recovery
- 12) Disaster Management includes:
- a) Mitigation
  - b) Reconstruction
  - c) Rehabilitation
  - d) All of the above
- 13) Which of the following is considered as objective of disaster management?
- a) Dispose dead bodies
  - b) Supplying of essential commodities
  - c) Rehabilitation of disaster victims
  - d) All of these
- 14) The role of which agency is important in disaster prevention.
- a) Media
  - b) Police
  - c) Government official
  - d) Public

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022  
CIVIL ENGINEERING**

**Risk Assessment and Vulnerability Analysis**

Day & Date: Thursday 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section – I out of Q.2, Q.3 & Q.4  
2) Solve any two Questions from Section – II out of Q.5, Q.6 & Q.7  
3) Figures to the right indicate full marks.  
4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> What are the different elements of Risk? Explain in detail.           | <b>07</b> |
|            | <b>b)</b> Define:   | <b>07</b> |
|            | i) Risk   |           |
|            | ii) Vulnerability   |           |
|            | iii) Hazard   |           |
|            | iv) Disasters   |           |
| <b>Q.3</b> | <b>a)</b> Explain various problems involved in the risk assessment process.     | <b>07</b> |
|            | <b>b)</b> Explain participatory risk assessment methods.                        | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain different social and economic factors of vulnerability.       | <b>07</b> |
|            | <b>b)</b> Explain vulnerability in the city and different risks in urban areas. | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain hazard resistant design and construction.   | <b>07</b> |
|            | <b>b)</b> Write a note on systematic management and strategic planning for vulnerability reduction. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the role of information and communication technology in health response.          | <b>07</b> |
|            | <b>b)</b> Explain the role of education and training in Health management of disaster.              | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Explain uses of remote sensing techniques in disaster preparedness.                       | <b>07</b> |
|            | <b>b)</b> What are emerging techniques in disaster preparedness? Enlist all the techniques          | <b>07</b> |



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022  
CIVIL ENGINEERING**

**Risk Assessment and Vulnerability Analysis**

Day & Date: Thursday 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Structural and Non-structural measures are elements of high category of Risk Reduction measures
  - a) Socio-economic measures      b) Physical measures
  - c) Environmental measures      d) Post disaster measures
- 2) Rehabilitation is the priority of which of the following phase?
  - a) Phase of emergency      b) Transitional Phase
  - c) Reconstruction Phase      d) Mock drill
- 3) What is it called when a large number of people in a community get a disease at the same time?
  - a) Influx      b) Black death
  - c) Epidemic      d) Pandemic
- 4) The cycle of disaster consists of the following components
  - a) Mitigation, Preparedness, Response, Recovery
  - b) Preparedness, vulnerability assessment, risk assessment, recovery
  - c) Mitigation, Risk assessment, Response and Recovery
  - d) None of the above
- 5) Production and use of harmful chemicals is under ban in \_\_\_\_\_ countries.
  - a) Developing countries      b) Developed countries
  - c) Third world countries      d) All of these
- 6) Which of the following groups of people is more vulnerable in the event of disaster?
  - a) Men, boys, old people      b) Men, women, boys
  - c) Women, children, old people      d) None of the above
- 7) The extent to which a community, structure, services or geographic area is likely to be damaged or disrupted by the impact of particular hazard is termed as
  - a) Capacity      b) Vulnerability
  - c) Risk      d) Hazard assessment

- 8) Vulnerability analysis comes in which part of the Disaster Management Cycle
- a) Mitigation
  - b) Preparedness
  - c) Response
  - d) Recovery
- 9) Disaster Management includes:
- a) Mitigation
  - b) Reconstruction
  - c) Rehabilitation
  - d) All of the above
- 10) Which of the following is considered as objective of disaster management?
- a) Dispose dead bodies
  - b) Supplying of essential commodities
  - c) Rehabilitation of disaster victims
  - d) All of these
- 11) The role of which agency is important in disaster prevention.
- a) Media
  - b) Police
  - c) Government official
  - d) Public
- 12) What are the important measure to be taken in community level of disaster preparedness
- a) Increased awareness
  - b) Provision of early and timely warning
  - c) Land use planning
  - d) All of the above
- 13) What are the major types oriented to mitigation measures of hazards and disasters?
- a) Public mitigation measures
  - b) Community mitigation measures
  - c) Both a and b
  - d) None of the above
- 14) Disaster management is aimed at-
- a) Resettling people in the closest unaffected urban area
  - b) Collection of valuable data for future management objectives
  - c) Strengthening sewage and drinking water treatment facilities to resist the impact of a future disaster
  - d) Restoring communities' services, facilities, and residences to pre-disaster levels

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Risk Assessment and Vulnerability Analysis**

Day & Date: Thursday 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section – I out of Q.2, Q.3 & Q.4  
 2) Solve any two Questions from Section – II out of Q.5, Q.6 & Q.7  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> What are the different elements of Risk? Explain in detail.           | <b>07</b> |
|            | <b>b)</b> Define:   | <b>07</b> |
|            | i) Risk   |           |
|            | ii) Vulnerability   |           |
|            | iii) Hazard   |           |
|            | iv) Disasters   |           |
| <b>Q.3</b> | <b>a)</b> Explain various problems involved in the risk assessment process.     | <b>07</b> |
|            | <b>b)</b> Explain participatory risk assessment methods.                        | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain different social and economic factors of vulnerability.       | <b>07</b> |
|            | <b>b)</b> Explain vulnerability in the city and different risks in urban areas. | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain hazard resistant design and construction.   | <b>07</b> |
|            | <b>b)</b> Write a note on systematic management and strategic planning for vulnerability reduction. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the role of information and communication technology in health response.          | <b>07</b> |
|            | <b>b)</b> Explain the role of education and training in Health management of disaster.              | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Explain uses of remote sensing techniques in disaster preparedness.                       | <b>07</b> |
|            | <b>b)</b> What are emerging techniques in disaster preparedness? Enlist all the techniques          | <b>07</b> |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Risk Assessment and Vulnerability Analysis**

Day & Date: Thursday 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Which of the following is considered as objective of disaster management?
  - a) Dispose dead bodies
  - b) Supplying of essential commodities
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  - d) All of these
- 2) The role of which agency is important in disaster prevention.
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  - b) Police
  - c) Government official
  - d) Public
- 3) What are the important measure to be taken in community level of disaster preparedness
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  - c) Land use planning
  - d) All of the above
- 4) What are the major types oriented to mitigation measures of hazards and disasters?
  - a) Public mitigation measures
  - b) Community mitigation measures
  - c) Both a and b
  - d) None of the above
- 5) Disaster management is aimed at-
  - a) Resettling people in the closest unaffected urban area
  - b) Collection of valuable data for future management objectives
  - c) Strengthening sewage and drinking water treatment facilities to resist the impact of a future disaster
  - d) Restoring communities' services, facilities, and residences to pre-disaster levels
- 6) Structural and Non-structural measures are elements of high category of Risk Reduction measures
  - a) Socio-economic measures
  - b) Physical measures
  - c) Environmental measures
  - d) Post disaster measures

- 7) Rehabilitation is the priority of which of the following phase?  
a) Phase of emergency                      b) Transitional Phase  
c) Reconstruction Phase                      d) Mock dill
- 8) What is it called when a large number of people in a community get a disease at the same time?  
a) Influx    b) Black death  
c) Epidemic    d) Pandemic
- 9) The cycle of disaster consists of the following components  
a) Mitigation, Preparedness, Response, Recovery  
b) Preparedness, vulnerability assessment, risk assessment, recovery  
c) Mitigation, Risk assessment, Response and Recovery  
d) None of the above
- 10) Production and use of harmful chemicals is under ban in \_\_\_\_\_ countries.  
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- 12) The extent to which a community, structure, services or geographic area is likely to be damaged or disrupted by the impact of particular hazard is termed as  
a) Capacity    b) Vulnerability  
c) Risk    d) Hazard assessment
- 13) Vulnerability analysis comes in which part of the Disaster Management Cycle  
a) Mitigation    b) Preparedness  
c) Response    d) Recovery
- 14) Disaster Management includes:  
a) Mitigation    b) Reconstruction  
c) Rehabilitation    d) All of the above

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Risk Assessment and Vulnerability Analysis**

Day & Date: Thursday 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section – I out of Q.2, Q.3 & Q.4  
 2) Solve any two Questions from Section – II out of Q.5, Q.6 & Q.7  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> What are the different elements of Risk? Explain in detail.           | <b>07</b> |
|            | <b>b)</b> Define:   | <b>07</b> |
|            | i) Risk   |           |
|            | ii) Vulnerability   |           |
|            | iii) Hazard   |           |
|            | iv) Disasters   |           |
| <b>Q.3</b> | <b>a)</b> Explain various problems involved in the risk assessment process.     | <b>07</b> |
|            | <b>b)</b> Explain participatory risk assessment methods.                        | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain different social and economic factors of vulnerability.       | <b>07</b> |
|            | <b>b)</b> Explain vulnerability in the city and different risks in urban areas. | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain hazard resistant design and construction.   | <b>07</b> |
|            | <b>b)</b> Write a note on systematic management and strategic planning for vulnerability reduction. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the role of information and communication technology in health response.          | <b>07</b> |
|            | <b>b)</b> Explain the role of education and training in Health management of disaster.              | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Explain uses of remote sensing techniques in disaster preparedness.                       | <b>07</b> |
|            | <b>b)</b> What are emerging techniques in disaster preparedness? Enlist all the techniques          | <b>07</b> |

<b>Seat No.</b>	
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## CIVIL ENGINEERING

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The 'rural road development plan: Vision 2021' aims to provide basic access to villages in how many phases?  
a) One  
b) Two  
c) Three  
d) four
- 2) The economical option during the construction of a road around a hill is \_\_\_\_\_.  
a) Cut the hill  
b) Provide a tunnel  
c) Provide a road around the hill  
d) Look for other alternative approaches
- 3) The coefficient of lateral friction as recommended by IRC is \_\_\_\_\_.  
a) 0.15  
b) 0.40  
c) 0.35  
d) 0.30
- 4) The braking efficiency for a vehicle moving with a speed of 18kmph, having a lag distance of 14m and coefficient of longitudinal friction is 0.36.  
a) 25.28%  
b) 25.4%  
c) 25.6%  
d) 25.8%
- 5) The desirable width as per IRC for median on rural roads is \_\_\_\_\_.  
a) 3m  
b) 5m  
c) 8m  
d) 14m
- 6) The minimum shoulder width recommended by IRC is \_\_\_\_\_.  
a) 1.0m  
b) 1.5m  
c) 2.0m  
d) 2.5m
- 7) What does MORTH stand for?  
a) Ministry of Road Traffic and Highways  
b) Model of Road Transit on Highways  
c) Ministry of Road Transport and Highways  
d) Model of Road Traffic in Highways
- 8) Which of the below indices is a measure of shearing strength of soil at the plastic limit?  
a) Plasticity index  
b) Consistency index  
c) Flow index  
d) Toughness index

- 9) The seepage flow is present in \_\_\_\_\_.  
a) Surface drainage                      b) Sub surface drainage  
c) Camber                                  d) Cross slope
- 10) Which is the most preferred shape of drainage?  
a) Rectangular                              b) Trapezoidal  
c) Triangular                                d) Circular
- 11) Under which situation is cutback bitumen used as a stabilizing agent?  
a) Low density                                b) High density  
c) High natural moisture content      d) Low natural moisture content
- 12) Frost protection layer is provided in between which layers?  
a) Surface and base course  
b) Sub-base and base course  
c) Subgrade and sub-base course  
d) Surface and sub-base course
- 13) The maintenance operations do not involve \_\_\_\_\_.  
a) Survey work  
b) Assessment of road condition  
c) Diagnosis  
d) Adopting the most appropriate steps
- 14) The maintenance works are not possible for \_\_\_\_\_.  
a) Shoulder                                    b) Pavement  
c) Embankment                                d) Sub grade



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022****CIVIL ENGINEERING****Planning and Design of Rural Roads**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Solve any two questions from Section -I  
 2) Solve any two Questions from Section -II  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

- Q.2** a) Explain the guidelines laid down in recent 20-year plans. **07**  
 b) Define alignment and explain factors controlling the alignment. **07**
- Q.3** a) What is the importance of studying the behavior of soil as a road construction material? **07**  
 b) What are the advantages and specifications for construction of cement concrete pavement? **07**
- Q.4** a) Define super elevation & explain the factors on which the design of super elevation depends. **07**  
 b) Calculate minimum sight distance required to avoid a head on collision of two cars approaching from the opposite directions at 90 & 60 kmph. Assume a reaction time 2.5 sec coefficient of friction of 0.7 & brake efficiency. **07**

**Section – II**

- Q.5** a) What are the requirements of good road drainage system? **07**  
 b) Write an explanatory note on cross drainage and drainage structure. **07**
- Q.6** a) Explain the specification of material for the construction of subgrade for pavement. **07**  
 b) Enlist the test for quality control as per IRC and explain any one in detail. **07**
- Q.7** a) Enlist the classification of maintenance activities and explain any two activities. **07**  
 b) Explain briefly maintenance of unpaved roads. **07**

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Planning and Design of Rural Roads**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the below indices is a measure of shearing strength of soil at the plastic limit?
 

a) Plasticity index	b) Consistency index
c) Flow index	d) Toughness index
- 2) The seepage flow is present in \_\_\_\_\_.
 

a) Surface drainage	b) Sub surface drainage
c) Camber	d) Cross slope
- 3) Which is the most preferred shape of drainage?
 

a) Rectangular	b) Trapezoidal
c) Triangular	d) Circular
- 4) Under which situation is cutback bitumen used as a stabilizing agent?
 

a) Low density	b) High density
c) High natural moisture content	d) Low natural moisture content
- 5) Frost protection layer is provided in between which layers?
 

a) Surface and base course
b) Sub-base and base course
c) Subgrade and sub-base course
d) Surface and sub-base course
- 6) The maintenance operations do not involve \_\_\_\_\_.
 

a) Survey work
b) Assessment of road condition
c) Diagnosis
d) Adopting the most appropriate steps
- 7) The maintenance works are not possible for \_\_\_\_\_.
 

a) Shoulder	b) Pavement
c) Embankment	d) Sub grade
- 8) The 'rural road development plan: Vision 2021' aims to provide basic access to villages in how many phases?
 

a) One	b) Two
c) Three	d) four

- 9) The economical option during the construction of a road around a hill is \_\_\_\_\_.  
a) Cut the hill  
b) Provide a tunnel  
c) Provide a road around the hill  
d) Look for other alternative approaches
- 10) The coefficient of lateral friction as recommended by IRC is \_\_\_\_\_.  
a) 0.15  
b) 0.40  
c) 0.35  
d) 0.30
- 11) The braking efficiency for a vehicle moving with a speed of 18kmph, having a lag distance of 14m and coefficient of longitudinal friction is 0.36.  
a) 25.28%  
b) 25.4%  
c) 25.6%  
d) 25.8%
- 12) The desirable width as per IRC for median on rural roads is \_\_\_\_\_.  
a) 3m  
b) 5m  
c) 8m  
d) 14m
- 13) The minimum shoulder width recommended by IRC is \_\_\_\_\_.  
a) 1.0m  
b) 1.5m  
c) 2.0m  
d) 2.5m
- 14) What does MORTH stand for?  
a) Ministry of Road Traffic and Highways  
b) Model of Road Transit on Highways  
c) Ministry of Road Transport and Highways  
d) Model of Road Traffic in Highways

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Planning and Design of Rural Roads**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section -I  
 2) Solve any two Questions from Section -II  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain the guidelines laid down in recent 20-year plans.  | <b>07</b> |
|            | <b>b)</b> Define alignment and explain factors controlling the alignment.  | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> What is the importance of studying the behavior of soil as a road construction material?   | <b>07</b> |
|            | <b>b)</b> What are the advantages and specifications for construction of cement concrete pavement?   | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Define super elevation & explain the factors on which the design of super elevation depends.   | <b>07</b> |
|            | <b>b)</b> Calculate minimum sight distance required to avoid a head on collision of two cars approaching from the opposite directions at 90 & 60 kmph. Assume a reaction time 2.5 sec coefficient of friction of 0.7 & brake efficiency. | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What are the requirements of good road drainage system?                              | <b>07</b> |
|            | <b>b)</b> Write an explanatory note on cross drainage and drainage structure.                  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the specification of material for the construction of subgrade for pavement. | <b>07</b> |
|            | <b>b)</b> Enlist the test for quality control as per IRC and explain any one in detail.        | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Enlist the classification of maintenance activities and explain any two activities.  | <b>07</b> |
|            | <b>b)</b> Explain briefly maintenance of unpaved roads.  | <b>07</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Planning and Design of Rural Roads**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Under which situation is cutback bitumen used as a stabilizing agent?
  - a) Low density
  - b) High density
  - c) High natural moisture content
  - d) Low natural moisture content
- 2) Frost protection layer is provided in between which layers?
  - a) Surface and base course
  - b) Sub-base and base course
  - c) Subgrade and sub-base course
  - d) Surface and sub-base course
- 3) The maintenance operations do not involve \_\_\_\_\_.
  - a) Survey work
  - b) Assessment of road condition
  - c) Diagnosis
  - d) Adopting the most appropriate steps
- 4) The maintenance works are not possible for \_\_\_\_\_.
  - a) Shoulder
  - b) Pavement
  - c) Embankment
  - d) Sub grade
- 5) The 'rural road development plan: Vision 2021' aims to provide basic access to villages in how many phases?
  - a) One
  - b) Two
  - c) Three
  - d) four
- 6) The economical option during the construction of a road around a hill is \_\_\_\_\_.
  - a) Cut the hill
  - b) Provide a tunnel
  - c) Provide a road around the hill
  - d) Look for other alternative approaches
- 7) The coefficient of lateral friction as recommended by IRC is \_\_\_\_\_.
  - a) 0.15
  - b) 0.40
  - c) 0.35
  - d) 0.30

- 8) The braking efficiency for a vehicle moving with a speed of 18kmph, having a lag distance of 14m and coefficient of longitudinal friction is 0.36.
  - a) 25.28%
  - b) 25.4%
  - c) 25.6%
  - d) 25.8%
- 9) The desirable width as per IRC for median on rural roads is \_\_\_\_\_.
  - a) 3m
  - b) 5m
  - c) 8m
  - d) 14m
- 10) The minimum shoulder width recommended by IRC is \_\_\_\_\_.
  - a) 1.0m
  - b) 1.5m
  - c) 2.0m
  - d) 2.5m
- 11) What does MORTH stand for?
  - a) Ministry of Road Traffic and Highways
  - b) Model of Road Transit on Highways
  - c) Ministry of Road Transport and Highways
  - d) Model of Road Traffic in Highways
- 12) Which of the below indices is a measure of shearing strength of soil at the plastic limit?
  - a) Plasticity index
  - b) Consistency index
  - c) Flow index
  - d) Toughness index
- 13) The seepage flow is present in \_\_\_\_\_.
  - a) Surface drainage
  - b) Sub surface drainage
  - c) Camber
  - d) Cross slope
- 14) Which is the most preferred shape of drainage?
  - a) Rectangular
  - b) Trapezoidal
  - c) Triangular
  - d) Circular

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**

**CIVIL ENGINEERING**

**Planning and Design of Rural Roads**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section -I  
2) Solve any two Questions from Section -II  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain the guidelines laid down in recent 20-year plans.  | <b>07</b> |
|            | <b>b)</b> Define alignment and explain factors controlling the alignment.  | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> What is the importance of studying the behavior of soil as a road construction material?   | <b>07</b> |
|            | <b>b)</b> What are the advantages and specifications for construction of cement concrete pavement?   | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Define super elevation & explain the factors on which the design of super elevation depends.   | <b>07</b> |
|            | <b>b)</b> Calculate minimum sight distance required to avoid a head on collision of two cars approaching from the opposite directions at 90 & 60 kmph. Assume a reaction time 2.5 sec coefficient of friction of 0.7 & brake efficiency. | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What are the requirements of good road drainage system?                              | <b>07</b> |
|            | <b>b)</b> Write an explanatory note on cross drainage and drainage structure.                  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the specification of material for the construction of subgrade for pavement. | <b>07</b> |
|            | <b>b)</b> Enlist the test for quality control as per IRC and explain any one in detail.        | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Enlist the classification of maintenance activities and explain any two activities.  | <b>07</b> |
|            | <b>b)</b> Explain briefly maintenance of unpaved roads.  | <b>07</b> |

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

## Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

- 1) The minimum shoulder width recommended by IRC is \_\_\_\_\_.  
a) 1.0m                                      b) 1.5m  
c) 2.0m                                      d) 2.5m
- 2) What does MORTH stand for?  
a) Ministry of Road Traffic and Highways  
b) Model of Road Transit on Highways  
c) Ministry of Road Transport and Highways  
d) Model of Road Traffic in Highways
- 3) Which of the below indices is a measure of shearing strength of soil at the plastic limit?  
a) Plasticity index                                      b) Consistency index  
c) Flow index    d) Toughness index
- 4) The seepage flow is present in \_\_\_\_\_.  
a) Surface drainage                                      b) Sub surface drainage  
c) Camber    d) Cross slope
- 5) Which is the most preferred shape of drainage?  
a) Rectangular    b) Trapezoidal  
c) Triangular    d) Circular
- 6) Under which situation is cutback bitumen used as a stabilizing agent?  
a) Low density    b) High density  
c) High natural moisture content      d) Low natural moisture content
- 7) Frost protection layer is provided in between which layers?  
a) Surface and base course  
b) Sub-base and base course  
c) Subgrade and sub-base course  
d) Surface and sub-base course
- 8) The maintenance operations do not involve \_\_\_\_\_.  
a) Survey work  
b) Assessment of road condition  
c) Diagnosis  
d) Adopting the most appropriate steps



- 9) The maintenance works are not possible for \_\_\_\_\_.
  - a) Shoulder
  - b) Pavement
  - c) Embankment
  - d) Sub grade
- 10) The 'rural road development plan: Vision 2021' aims to provide basic access to villages in how many phases?
  - a) One
  - b) Two
  - c) Three
  - d) four
- 11) The economical option during the construction of a road around a hill is \_\_\_\_\_.
  - a) Cut the hill
  - b) Provide a tunnel
  - c) Provide a road around the hill
  - d) Look for other alternative approaches
- 12) The coefficient of lateral friction as recommended by IRC is \_\_\_\_\_.
  - a) 0.15
  - b) 0.40
  - c) 0.35
  - d) 0.30
- 13) The braking efficiency for a vehicle moving with a speed of 18kmph, having a lag distance of 14m and coefficient of longitudinal friction is 0.36.
  - a) 25.28%
  - b) 25.4%
  - c) 25.6%
  - d) 25.8%
- 14) The desirable width as per IRC for median on rural roads is \_\_\_\_\_.
  - a) 3m
  - b) 5m
  - c) 8m
  - d) 14m

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022****CIVIL ENGINEERING****Planning and Design of Rural Roads**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Solve any two questions from Section -I  
 2) Solve any two Questions from Section -II  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

- Q.2** a) Explain the guidelines laid down in recent 20-year plans. **07**  
 b) Define alignment and explain factors controlling the alignment. **07**
- Q.3** a) What is the importance of studying the behavior of soil as a road construction material? **07**  
 b) What are the advantages and specifications for construction of cement concrete pavement? **07**
- Q.4** a) Define super elevation & explain the factors on which the design of super elevation depends. **07**  
 b) Calculate minimum sight distance required to avoid a head on collision of two cars approaching from the opposite directions at 90 & 60 kmph. Assume a reaction time 2.5 sec coefficient of friction of 0.7 & brake efficiency. **07**

**Section – II**

- Q.5** a) What are the requirements of good road drainage system? **07**  
 b) Write an explanatory note on cross drainage and drainage structure. **07**
- Q.6** a) Explain the specification of material for the construction of subgrade for pavement. **07**  
 b) Enlist the test for quality control as per IRC and explain any one in detail. **07**
- Q.7** a) Enlist the classification of maintenance activities and explain any two activities. **07**  
 b) Explain briefly maintenance of unpaved roads. **07**

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022  
CIVIL ENGINEERING**

**Construction Materials: Sustainability and Usability**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Factors affecting the performance of green material/product is/are \_\_\_\_\_.  
 a) Surrounding buildings                      b) Population  
 c) Vehicles                                        d) All of the above
- 2) Sustainable building means that \_\_\_\_\_.  
 a) Green building                                b) Environmental building  
 c) Both a) & b)                                    d) None of these
- 3) Which of the following is not the purpose of a green building?  
 a) To reduce use of water  
 b) To minimize damage of the environment  
 c) Re-use of waste materials  
 d) None of the above
- 4) Resource efficiency can be achieved by utilizing materials to \_\_\_\_\_.  
 a) Recycled content                              b) Reusable content  
 c) Reusable packaging                         d) None of the above
- 5) Which of the following is not correct constituent in ideal CSEB?  
 a) Silt- 15%                                        b) Gravel- 20%  
 c) Clay-20%                                        d) Sand- 50%
- 6) SMB is a building material made primarily from \_\_\_\_\_ compressed at high pressure to form blocks.  
 a) Damp soil                                        b) Cement  
 c) Lime    d) None of the above
- 7) Embodied energy is the energy consumed by \_\_\_\_\_ associated with the production of a product.  
 a) Construction                                   b) Transportation  
 c) Manufacturing                                 d) All of the above
- 8) \_\_\_\_\_ is necessary to demolish and dispose of the building at the end of its life.  
 a) Initial embodied energy                      b) Recurring embodied energy  
 c) Both of the above                              d) None of the above
- 9) Which of the following is not the factor while selecting the car?  
 a) CO<sub>2</sub> rating                                      b) Fuel type  
 c) Model    d) None of the above

- 10) The light-weight concrete is prepared by \_\_\_\_\_.  
a) Mixing Portland cement with sawdust in specified proportion in the concrete  
b) Using coke-breeze, cinder or slag as aggregate in the concrete  
c) Mixing aluminum in the concrete  
d) Mixing steel in the concrete
- 11) \_\_\_\_\_ undergo chemical change in their composition when heated.  
a) Thermoplastics  
b) Thermoset plastics  
c) Thermal plastics  
d) None of the above
- 12) PET bottles take \_\_\_\_\_ years to biodegrade.  
a) 50  
b) 100  
c) 200  
d) 500
- 13) The vast majority of DCCs end up in landfill, or \_\_\_\_\_.  
a) Incineration  
b) Recycling industry  
c) Composting  
d) All of the above
- 14) Full form of GRIHA is \_\_\_\_\_.  
a) Green Rating for Indian Habitat Assessment  
b) Green Rating for Integrated Habitat Assessment  
c) Green Rating for International Habitat Assessment  
d) Green Rating for Information Habitat Assessment

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Construction Materials: Sustainability and Usability**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> What is embodied energy? Explain initial recurring embodied energy of building. | <b>05</b> |
|            | <b>b)</b> Explain numerous activities that affects the carbon footprints of individuals.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> How Resource efficiency can be accomplished by utilizing green material?        | <b>05</b> |
|            | <b>b)</b> Discuss process of selection of bamboo in the construction of green building.   | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain properties of eco-friendly materials in detail.                         | <b>05</b> |
|            | <b>b)</b> Explain compressed Stabilized Earth Blocks in detail.                           | <b>04</b> |
| <b>Q.5</b> | <b>a)</b> Explain the properties & advantages of filler materials.                        | <b>05</b> |
|            | <b>b)</b> Explain Composite panel and its advantages in green building.                   | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Differentiate Recycle and Reuse of solid waste   | <b>05</b> |
|            | <b>b)</b> Explain initial & recurring application in life cycle of concrete in detail. What are eco audits & eco tools? Explain with examples. | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Explain various Plastic recycling process in detail.   | <b>05</b> |
|            | <b>b)</b> Provide numerous techniques for designing green concrete materials for 2BHK house having build-up area of 26 m <sup>2</sup> .        | <b>04</b> |
| <b>Q.8</b> | <b>a)</b> Explain various methodologies in material substitution for eco-efficient design of 10-storey commercial building.                    | <b>05</b> |
|            | <b>b)</b> Explain the difference between thermoplastics and thermoset plastics with example.   | <b>04</b> |
| <b>Q.9</b> | <b>a)</b> Discuss effects of toxic waste on environment.   | <b>05</b> |
|            | <b>b)</b> Define reducing of waste. Discuss advantages of reducing of waste with a practical example.  | <b>04</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022  
CIVIL ENGINEERING**

**Construction Materials: Sustainability and Usability**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ is necessary to demolish and dispose of the building at the end of its life.
  - a) Initial embodied energy
  - b) Recurring embodied energy
  - c) Both of the above
  - d) None of the above
- 2) Which of the following is not the factor while selecting the car?
  - a) CO<sub>2</sub> rating
  - b) Fuel type
  - c) Model
  - d) None of the above
- 3) The light-weight concrete is prepared by \_\_\_\_\_.
  - a) Mixing Portland cement with sawdust in specified proportion in the concrete
  - b) Using coke-breeze, cinder or slag as aggregate in the concrete
  - c) Mixing aluminum in the concrete
  - d) Mixing steel in the concrete
- 4) \_\_\_\_\_ undergo chemical change in their composition when heated.
  - a) Thermoplastics
  - b) Thermoset plastics
  - c) Thermal plastics
  - d) None of the above
- 5) PET bottles take \_\_\_\_\_ years to biodegrade.
  - a) 50
  - b) 100
  - c) 200
  - d) 500
- 6) The vast majority of DCCs end up in landfill, or \_\_\_\_\_.
  - a) Incineration
  - b) Recycling industry
  - c) Composting
  - d) All of the above
- 7) Full form of GRIHA is \_\_\_\_\_.
  - a) Green Rating for Indian Habitat Assessment
  - b) Green Rating for Integrated Habitat Assessment
  - c) Green Rating for International Habitat Assessment
  - d) Green Rating for Information Habitat Assessment
- 8) Factors affecting the performance of green material/product is/are \_\_\_\_\_.
  - a) Surrounding buildings
  - b) Population
  - c) Vehicles
  - d) All of the above

- 9) Sustainable building means that \_\_\_\_\_.
  - a) Green building
  - b) Environmental building
  - c) Both a) & b)
  - d) None of these
- 10) Which of the following is not the purpose of a green building?
  - a) To reduce use of water
  - b) To minimize damage of the environment
  - c) Re-use of waste materials
  - d) None of the above
- 11) Resource efficiency can be achieved by utilizing materials to \_\_\_\_\_.
  - a) Recycled content
  - b) Reusable content
  - c) Reusable packaging
  - d) None of the above
- 12) Which of the following is not correct constituent in ideal CSEB?
  - a) Silt- 15%
  - b) Gravel- 20%
  - c) Clay-20%
  - d) Sand- 50%
- 13) SMB is a building material made primarily from \_\_\_\_\_ compressed at high pressure to form blocks.
  - a) Damp soil
  - b) Cement
  - c) Lime
  - d) None of the above
- 14) Embodied energy is the energy consumed by \_\_\_\_\_ associated with the production of a product.
  - a) Construction
  - b) Transportation
  - c) Manufacturing
  - d) All of the above

Seat No.	
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Set Q
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Construction Materials: Sustainability and Usability**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

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**Section – I**

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|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> What is embodied energy? Explain initial recurring embodied energy of building. | <b>05</b> |
|            | <b>b)</b> Explain numerous activities that affects the carbon footprints of individuals.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> How Resource efficiency can be accomplished by utilizing green material?        | <b>05</b> |
|            | <b>b)</b> Discuss process of selection of bamboo in the construction of green building.   | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain properties of eco-friendly materials in detail.                         | <b>05</b> |
|            | <b>b)</b> Explain compressed Stabilized Earth Blocks in detail.                           | <b>04</b> |
| <b>Q.5</b> | <b>a)</b> Explain the properties & advantages of filler materials.                        | <b>05</b> |
|            | <b>b)</b> Explain Composite panel and its advantages in green building.                   | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Differentiate Recycle and Reuse of solid waste   | <b>05</b> |
|            | <b>b)</b> Explain initial & recurring application in life cycle of concrete in detail. What are eco audits & eco tools? Explain with examples. | <b>05</b> |
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

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  - a) Thermoplastics
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  - c) 200
  - d) 500
- 3) The vast majority of DCCs end up in landfill, or \_\_\_\_\_.
  - a) Incineration
  - b) Recycling industry
  - c) Composing
  - d) All of the above
- 4) Full form of GRIHA is \_\_\_\_\_.
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- 5) Factors affecting the performance of green material/product is/are \_\_\_\_\_.
  - a) Surrounding buildings
  - b) Population
  - c) Vehicles
  - d) All of the above
- 6) Sustainable building means that \_\_\_\_\_.
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- 8) Resource efficiency can be achieved by utilizing materials to \_\_\_\_\_.
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  - b) Reusable content
  - c) Reusable packaging
  - d) None of the above
- 9) Which of the following is not correct constituent in ideal CSEB?
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  - b) Gravel- 20%
  - c) Clay-20%
  - d) Sand- 50%

- 10)** SMB is a building material made primarily from \_\_\_\_\_ compressed at high pressure to form blocks.
- a) Damp soil
  - b) Cement
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  - d) None of the above
- 11)** Embodied energy is the energy consumed by \_\_\_\_\_ associated with the production of a product.
- a) Construction
  - b) Transportation
  - c) Manufacturing
  - d) All of the above
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- 14)** The light-weight concrete is prepared by \_\_\_\_\_.
- a) Mixing Portland cement with sawdust in specified proportion in the concrete
  - b) Using coke-breeze, cinder or slag as aggregate in the concrete
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Set R
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022  
CIVIL ENGINEERING**

**Construction Materials: Sustainability and Usability**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

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**Section – I**

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| <b>Q.3</b> | <b>a)</b> How Resource efficiency can be accomplished by utilizing green material?        | <b>05</b> |
|            | <b>b)</b> Discuss process of selection of bamboo in the construction of green building.   | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain properties of eco-friendly materials in detail.                         | <b>05</b> |
|            | <b>b)</b> Explain compressed Stabilized Earth Blocks in detail.                           | <b>04</b> |
| <b>Q.5</b> | <b>a)</b> Explain the properties & advantages of filler materials.                        | <b>05</b> |
|            | <b>b)</b> Explain Composite panel and its advantages in green building.                   | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Differentiate Recycle and Reuse of solid waste   | <b>05</b> |
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|            | <b>b)</b> Provide numerous techniques for designing green concrete materials for 2BHK house having build-up area of 26 m <sup>2</sup> .        | <b>04</b> |
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022  
CIVIL ENGINEERING**

**Construction Materials: Sustainability and Usability**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) SMB is a building material made primarily from \_\_\_\_\_ compressed at high pressure to form blocks.
 

a) Damp soil	b) Cement
c) Lime	d) None of the above
- 2) Embodied energy is the energy consumed by \_\_\_\_\_ associated with the production of a product.
 

a) Construction	b) Transportation
c) Manufacturing	d) All of the above
- 3) \_\_\_\_\_ is necessary to demolish and dispose of the building at the end of its life.
 

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- 4) Which of the following is not the factor while selecting the car?
 

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a) Thermoplastics	b) Thermoset plastics
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a) 50	b) 100
c) 200	d) 500
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c) Composing	d) All of the above

- 9) Full form of GRIHA is \_\_\_\_\_.  
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b) Green Rating for Integrated Habitat Assessment  
c) Green Rating for International Habitat Assessment  
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- 10) Factors affecting the performance of green material/product is/are \_\_\_\_\_.  
a) Surrounding buildings                      b) Population  
c) Vehicles                                      d) All of the above
- 11) Sustainable building means that \_\_\_\_\_.  
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c) Both a) & b)                                  d) None of these
- 12) Which of the following is not the purpose of a green building?  
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b) To minimize damage of the environment  
c) Re-use of waste materials  
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- 13) Resource efficiency can be achieved by utilizing materials to \_\_\_\_\_.  
a) Recycled content                              b) Reusable content  
c) Reusable packaging                          d) None of the above
- 14) Which of the following is not correct constituent in ideal CSEB?  
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c) Clay-20%                                      d) Sand- 50%

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Construction Materials: Sustainability and Usability**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

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**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> What is embodied energy? Explain initial recurring embodied energy of building. | <b>05</b> |
|            | <b>b)</b> Explain numerous activities that affects the carbon footprints of individuals.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> How Resource efficiency can be accomplished by utilizing green material?        | <b>05</b> |
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| <b>Q.4</b> | <b>a)</b> Explain properties of eco-friendly materials in detail.                         | <b>05</b> |
|            | <b>b)</b> Explain compressed Stabilized Earth Blocks in detail.                           | <b>04</b> |
| <b>Q.5</b> | <b>a)</b> Explain the properties & advantages of filler materials.                        | <b>05</b> |
|            | <b>b)</b> Explain Composite panel and its advantages in green building.                   | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Differentiate Recycle and Reuse of solid waste   | <b>05</b> |
|            | <b>b)</b> Explain initial & recurring application in life cycle of concrete in detail. What are eco audits & eco tools? Explain with examples. | <b>05</b> |
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|            | <b>b)</b> Define reducing of waste. Discuss advantages of reducing of waste with a practical example.  | <b>04</b> |

Seat No.	
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## Managing Innovation and Entrepreneurship

Max. Marks: 70

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Duration: 30 Minutes

Marks:14

14

- 1) What are the reasons for resistance to change?
  - a) Fear of failure
  - b) Inertia
  - c) Lack of confidence
  - d) All of the above
- 2) Which among the following is an important school of creative thinking?
  - a) Design Thinking
  - b) Behavior Thinking
  - c) Linear Thinking
  - d) Profit Thinking
- 3) Elkington introduced the sustainability concept as a "triple bottom line." What are the three important dimensions (3P's) of sustainability?
  - a) People, Planet, and Profit
  - b) People, Profit, and Product
  - c) Process, People, and Product
  - d) Profit, People, and Process
- 4) Who is not involved in the selection of ideas in idea management?
  - a) Internal experts
  - b) External experts
  - c) A mix of Internal and External Experts
  - d) Basic raw material supplier
- 5) Which one of the following is not a type of innovation according to industry system?
  - a) Product innovation
  - b) Process innovation
  - c) Personnel Innovation
  - d) Business Model innovation
- 6) Innovation is defined as:
  - a) The commercialization of a new product or process
  - b) A new product or process idea
  - c) The implementation of a new production method
  - d) The invention of a new product or process
- 7) Who is an idea Champion?
  - a) The one who defeats elephant of ideas
  - b) The rider who shapes the path for elephant
  - c) The one who open new channels for idea to move forward
  - d) All the above

- 8) An entrepreneur is someone who
- Organize a business
  - Manages a business
  - Takes risks
  - All of the above
- 9) What are the elements in the four action framework of Blue Ocean Strategy?
- Eliminate, Reduce, Reuse, and Recycle
  - Eliminate, Reduce, Raise, and Create
  - Eliminate, Recreate, Recycle, and Reuse
  - Reduce, Reuse, Recycle, and Recreate
- 10) Match the following:
- |                           |                           |
|---------------------------|---------------------------|
| 1) Base technologies      | i) Decline phase          |
| 2) Key technologies       | ii) Maturity phase        |
| 3) Pacing technologies    | iii) Growth phase         |
| 4) Emerging technologies  | iv) Emerging phase        |
| a) 3-ii, 1-iii, 2-i, 4-iv | b) 1-i, 2-iii, 3-ii, 4-iv |
| c) 4-ii, 2-i, 3-iv, 1-iii | d) 1-iv, 2-iii, 3-ii, 4-i |
- 11) What are the benefits of innovations resulting from economic initiatives?
- Reduced expenses
  - Productivity gains through modernization of production tools
  - Ability to meet growing demand for eco-responsible and personalized products.
  - All of the above
- 12) What is the main objective of granting a patent?
- To encourage and develop new technology and Industry
  - To create monopoly
  - To make the patent commercial
  - All the above
- 13) Which of the following statement is true:
- Patent is valid within geographical boundary.
  - Patent last for 15 years.
  - The person who pays for the invention owns the patent.
  - None of the above
- 14) What are the benefits of innovations resulting from economic initiatives?
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Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Managing Innovation and Entrepreneurship**

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**Section - I**

- Q.2** a) What are economic theories of entrepreneurship? Explain in detail **06**  
       i) Richard Cantillon's theory  
       ii) Marshallian Theory  
       iii) Kizner's Theory  
 b) What are managerial Competencies? Explain four pillars of managerial competencies. **04**
- Q.3** a) Explain various economic incentives used to attract consumers. **04**  
 b) Enlist and explain the 7 Sources of Innovative Opportunity. **05**
- Q.4** a) Explain the term Innovation Process with neat sketch. **04**  
 b) Explain the term Innovation Strategies. Enlist different types of Innovation Strategies and explain in detail with examples. **05**
- Q.5** a) Differentiate the Blue ocean strategy and Red ocean strategy **04**  
 b) List the types of purposeful innovation and explain in detail. **05**

**Section – II**

- Q.6** a) Brief in short at least 5 stories of successful Indian entrepreneur. **06**  
 b) What is meant by acquiring technological Innovation and mention the benefit of the same? **04**
- Q.7** a) List out the four main elements of international business environments and explain the Characteristics of International Entrepreneurs. **04**  
 b) Write in short the benefits of learning and relearning process in entrepreneurship development. **05**
- Q.8** a) Write a short note on at least 5 International Entrepreneur and their businesses. **04**  
 b) What are the Methods of problem identification? **05**
- Q.9** a) What is Problem solving? Explain the steps for it. **04**  
 b) Explain the term Innovation and Diversification. **05**

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

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  - a) Eliminate, Reduce, Reuse, and Recycle
  - b) Eliminate, Reduce, Raise, and Create
  - c) Eliminate, Recreate, Recycle, and Reuse
  - d) Reduce, Reuse, Recycle, and Recreate
- 3) Match the following:
 

1) Base technologies	i) Decline phase
2) Key technologies	ii) Maturity phase
3) Pacing technologies	iii) Growth phase
4) Emerging technologies	iv) Emerging phase
a) 3-ii, 1-iii, 2-i, 4-iv	b) 1-i, 2-iii, 3-ii, 4-iv
c) 4-ii, 2-i, 3-iv, 1-iii	d) 1-iv, 2-iii, 3-ii, 4-i
- 4) What are the benefits of innovations resulting from economic initiatives?
  - a) Reduced expenses
  - b) Productivity gains through modernization of production tools
  - c) Ability to meet growing demand for eco-responsible and personalized products.
  - d) All of the above
- 5) What is the main objective of granting a patent?
  - a) To encourage and develop new technology and Industry
  - b) To create monopoly
  - c) To make the patent commercial
  - d) All the above
- 6) Which of the following statement is true:
  - a) Patent is valid within geographical boundary.
  - b) Patent last for 15 years.
  - c) The person who pays for the invention owns the patent.
  - d) None of the above

- 7) What are the benefits of innovations resulting from economic initiatives?
- a) Reduced expenses
  - b) Productivity gains through modernization of production tools
  - c) Ability to meet growing demand for eco-responsible and personalized products
  - d) All of the above
- 8) What are the reasons for resistance to change?
- a) Fear of failure
  - b) Inertia
  - c) Lack of confidence
  - d) All of the above
- 9) Which among the following is an important school of creative thinking?
- a) Design Thinking
  - b) Behavior Thinking
  - c) Linear Thinking
  - d) Profit Thinking
- 10) Elkington introduced the sustainability concept as a "triple bottom line." What are the three important dimensions (3P's) of sustainability?
- a) People, Planet, and Profit
  - b) People, Profit, and Product
  - c) Process, People, and Product
  - d) Profit, People, and Process
- 11) Who is not involved in the selection of ideas in idea management?
- a) Internal experts
  - b) External experts
  - c) A mix of Internal and External Experts
  - d) Basic raw material supplier
- 12) Which one of the following is not a type of innovation according to industry system?
- a) Product innovation
  - b) Process innovation
  - c) Personnel Innovation
  - d) Business Model innovation
- 13) Innovation is defined as:
- a) The commercialization of a new product or process
  - b) A new product or process idea
  - c) The implementation of a new production method
  - d) The invention of a new product or process
- 14) Who is an idea Champion?
- a) The one who defeats elephant of ideas
  - b) The rider who shapes the path for elephant
  - c) The one who open new channels for idea to move forward
  - d) All the above

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**

**CIVIL ENGINEERING**

**Managing Innovation and Entrepreneurship**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed

**Section - I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What are economic theories of entrepreneurship? Explain in detail  | <b>06</b> |
|            | i) Richard Cantillon's theory  |           |
|            | ii) Marshallian Theory   |           |
|            | iii) Kizner's Theory   |           |
|            | <b>b)</b> What are managerial Competencies? Explain four pillars of managerial competencies.   | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Explain various economic incentives used to attract consumers.   | <b>04</b> |
|            | <b>b)</b> Enlist and explain the 7 Sources of Innovative Opportunity.  | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Explain the term Innovation Process with neat sketch.  | <b>04</b> |
|            | <b>b)</b> Explain the term Innovation Strategies. Enlist different types of Innovation Strategies and explain in detail with examples. | <b>05</b> |
| <b>Q.5</b> | <b>a)</b> Differentiate the Blue ocean strategy and Red ocean strategy   | <b>04</b> |
|            | <b>b)</b> List the types of purposeful innovation and explain in detail.   | <b>05</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Brief in short at least 5 stories of successful Indian entrepreneur.   | <b>06</b> |
|            | <b>b)</b> What is meant by acquiring technological Innovation and mention the benefit of the same?   | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> List out the four main elements of international business environments and explain the Characteristics of International Entrepreneurs. | <b>04</b> |
|            | <b>b)</b> Write in short the benefits of learning and relearning process in entrepreneurship development.  | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> Write a short note on at least 5 International Entrepreneur and their businesses.  | <b>04</b> |
|            | <b>b)</b> What are the Methods of problem identification?  | <b>05</b> |
| <b>Q.9</b> | <b>a)</b> What is Problem solving? Explain the steps for it.   | <b>04</b> |
|            | <b>b)</b> Explain the term Innovation and Diversification.   | <b>05</b> |

<b>Seat No.</b>	
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<b>Set R</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Managing Innovation and Entrepreneurship**

Day & Date: Thursday, 16-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) What are the benefits of innovations resulting from economic initiatives?
  - a) Reduced expenses
  - b) Productivity gains through modernization of production tools
  - c) Ability to meet growing demand for eco-responsible and personalized products.
  - d) All of the above
- 2) What is the main objective of granting a patent?
  - a) To encourage and develop new technology and Industry
  - b) To create monopoly
  - c) To make the patent commercial
  - d) All the above
- 3) Which of the following statement is true:
  - a) Patent is valid within geographical boundary.
  - b) Patent last for 15 years.
  - c) The person who pays for the invention owns the patent.
  - d) None of the above
- 4) What are the benefits of innovations resulting from economic initiatives?
  - a) Reduced expenses
  - b) Productivity gains through modernization of production tools
  - c) Ability to meet growing demand for eco-responsible and personalized products
  - d) All of the above
- 5) What are the reasons for resistance to change?
  - a) Fear of failure
  - b) Inertia
  - c) Lack of confidence
  - d) All of the above
- 6) Which among the following is an important school of creative thinking?
  - a) Design Thinking
  - b) Behavior Thinking
  - c) Linear Thinking
  - d) Profit Thinking

- 7) Elkington introduced the sustainability concept as a "triple bottom line." What are the three important dimensions (3P's) of sustainability?
- People, Planet, and Profit
  - People, Profit, and Product
  - Process, People, and Product
  - Profit, People, and Process
- 8) Who is not involved in the selection of ideas in idea management?
- Internal experts
  - External experts
  - A mix of Internal and External Experts
  - Basic raw material supplier
- 9) Which one of the following is not a type of innovation according to industry system?
- Product innovation
  - Process innovation
  - Personnel Innovation
  - Business Model innovation
- 10) Innovation is defined as:
- The commercialization of a new product or process
  - A new product or process idea
  - The implementation of a new production method
  - The invention of a new product or process
- 11) Who is an idea Champion?
- The one who defeats elephant of ideas
  - The rider who shapes the path for elephant
  - The one who open new channels for idea to move forward
  - All the above
- 12) An entrepreneur is someone who
- Organize a business
  - Manages a business
  - Takes risks
  - All of the above
- 13) What are the elements in the four action framework of Blue Ocean Strategy?
- Eliminate, Reduce, Reuse, and Recycle
  - Eliminate, Reduce, Raise, and Create
  - Eliminate, Recreate, Recycle, and Reuse
  - Reduce, Reuse, Recycle, and Recreate
- 14) Match the following:
- |                           |                           |
|---------------------------|---------------------------|
| 1) Base technologies      | i) Decline phase          |
| 2) Key technologies       | ii) Maturity phase        |
| 3) Pacing technologies    | iii) Growth phase         |
| 4) Emerging technologies  | iv) Emerging phase        |
| a) 3-ii, 1-iii, 2-i, 4-iv | b) 1-i, 2-iii, 3-ii, 4-iv |
| c) 4-ii, 2-i, 3-iv, 1-iii | d) 1-iv, 2-iii, 3-ii, 4-i |

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Set **R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Managing Innovation and Entrepreneurship**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed

**Section - I**

- Q.2** a) What are economic theories of entrepreneurship? Explain in detail **06**  
       i) Richard Cantillon's theory  
       ii) Marshallian Theory  
       iii) Kizner's Theory  
 b) What are managerial Competencies? Explain four pillars of managerial competencies. **04**
- Q.3** a) Explain various economic incentives used to attract consumers. **04**  
 b) Enlist and explain the 7 Sources of Innovative Opportunity. **05**
- Q.4** a) Explain the term Innovation Process with neat sketch. **04**  
 b) Explain the term Innovation Strategies. Enlist different types of Innovation Strategies and explain in detail with examples. **05**
- Q.5** a) Differentiate the Blue ocean strategy and Red ocean strategy **04**  
 b) List the types of purposeful innovation and explain in detail. **05**

**Section – II**

- Q.6** a) Brief in short at least 5 stories of successful Indian entrepreneur. **06**  
 b) What is meant by acquiring technological Innovation and mention the benefit of the same? **04**
- Q.7** a) List out the four main elements of international business environments and explain the Characteristics of International Entrepreneurs. **04**  
 b) Write in short the benefits of learning and relearning process in entrepreneurship development. **05**
- Q.8** a) Write a short note on at least 5 International Entrepreneur and their businesses. **04**  
 b) What are the Methods of problem identification? **05**
- Q.9** a) What is Problem solving? Explain the steps for it. **04**  
 b) Explain the term Innovation and Diversification. **05**

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Managing Innovation and Entrepreneurship**

Day & Date: Thursday, 16-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Innovation is defined as:
  - a) The commercialization of a new product or process
  - b) A new product or process idea
  - c) The implementation of a new production method
  - d) The invention of a new product or process
- 2) Who is an idea Champion?
  - a) The one who defeats elephant of ideas
  - b) The rider who shapes the path for elephant
  - c) The one who open new channels for idea to move forward
  - d) All the above
- 3) An entrepreneur is someone who
 

a) Organize a business	b) Manages a business
c) Takes risks	d) All of the above
- 4) What are the elements in the four action framework of Blue Ocean Strategy?
  - a) Eliminate, Reduce, Reuse, and Recycle
  - b) Eliminate, Reduce, Raise, and Create
  - c) Eliminate, Recreate, Recycle, and Reuse
  - d) Reduce, Reuse, Recycle, and Recreate
- 5) Match the following:
 

1) Base technologies	i) Decline phase
2) Key technologies	ii) Maturity phase
3) Pacing technologies	iii) Growth phase
4) Emerging technologies	iv) Emerging phase
a) 3-ii, 1-iii, 2-i, 4-iv	b) 1-i, 2-iii, 3-ii, 4-iv
c) 4-ii, 2-i, 3-iv, 1-iii	d) 1-iv, 2-iii, 3-ii, 4-i
- 6) What are the benefits of innovations resulting from economic initiatives?
  - a) Reduced expenses
  - b) Productivity gains through modernization of production tools
  - c) Ability to meet growing demand for eco-responsible and personalized products.
  - d) All of the above



- 7) What is the main objective of granting a patent?
- a) To encourage and develop new technology and Industry
  - b) To create monopoly
  - c) To make the patent commercial
  - d) All the above
- 8) Which of the following statement is true:
- a) Patent is valid within geographical boundary.
  - b) Patent last for 15 years.
  - c) The person who pays for the invention owns the patent.
  - d) None of the above
- 9) What are the benefits of innovations resulting from economic initiatives?
- a) Reduced expenses
  - b) Productivity gains through modernization of production tools
  - c) Ability to meet growing demand for eco-responsible and personalized products
  - d) All of the above
- 10) What are the reasons for resistance to change?
- a) Fear of failure
  - b) Inertia
  - c) Lack of confidence
  - d) All of the above
- 11) Which among the following is an important school of creative thinking?
- a) Design Thinking
  - b) Behavior Thinking
  - c) Linear Thinking
  - d) Profit Thinking
- 12) Elkington introduced the sustainability concept as a "triple bottom line." What are the three important dimensions (3P's) of sustainability?
- a) People, Planet, and Profit
  - b) People, Profit, and Product
  - c) Process, People, and Product
  - d) Profit, People, and Process
- 13) Who is not involved in the selection of ideas in idea management?
- a) Internal experts
  - b) External experts
  - c) A mix of Internal and External Experts
  - d) Basic raw material supplier
- 14) Which one of the following is not a type of innovation according to industry system?
- a) Product innovation
  - b) Process innovation
  - c) Personnel Innovation
  - d) Business Model innovation

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Set **S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Managing Innovation and Entrepreneurship**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed

**Section - I**

- Q.2** a) What are economic theories of entrepreneurship? Explain in detail **06**  
       i) Richard Cantillon's theory  
       ii) Marshallian Theory  
       iii) Kizner's Theory  
 b) What are managerial Competencies? Explain four pillars of managerial competencies. **04**
- Q.3** a) Explain various economic incentives used to attract consumers. **04**  
 b) Enlist and explain the 7 Sources of Innovative Opportunity. **05**
- Q.4** a) Explain the term Innovation Process with neat sketch. **04**  
 b) Explain the term Innovation Strategies. Enlist different types of Innovation Strategies and explain in detail with examples. **05**
- Q.5** a) Differentiate the Blue ocean strategy and Red ocean strategy **04**  
 b) List the types of purposeful innovation and explain in detail. **05**

**Section – II**

- Q.6** a) Brief in short at least 5 stories of successful Indian entrepreneur. **06**  
 b) What is meant by acquiring technological Innovation and mention the benefit of the same? **04**
- Q.7** a) List out the four main elements of international business environments and explain the Characteristics of International Entrepreneurs. **04**  
 b) Write in short the benefits of learning and relearning process in entrepreneurship development. **05**
- Q.8** a) Write a short note on at least 5 International Entrepreneur and their businesses. **04**  
 b) What are the Methods of problem identification? **05**
- Q.9** a) What is Problem solving? Explain the steps for it. **04**  
 b) Explain the term Innovation and Diversification. **05**

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
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- 3) Which one of the following is not the function of money?
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- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
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  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |



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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8)** Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9)** Variable factor means those factors of production \_\_\_\_.
- a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 10)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?  
a) To maintain term deposits of the households  
b) To ensure price stability  
c) To arrange loans for the businessmen  
d) None of the above
- 8) Which one of the following cost can never become zero?  
a) Average cost  
b) Fixed cost  
c) Marginal cost  
d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_  
a) Economic behavior of individual economic decision-making units  
b) Economy as whole  
c) Trade relations  
d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_  
a) Private only  
b) Public only  
c) None  
d) Both (a) public and (b) private

**SLR-HL-11**

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850

- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

<b>Seat No.</b>	
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**Set Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two)**

**20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four)**

**20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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## Intellectual Property Rights for Technology Development and Management

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks:10

10

- 1) The first Patent Law was enacted in India in the year \_\_\_\_

a) 1856	b) 1880
c) 1905	d) 1850
- 2) All of the following are examples of intellectual property protections except \_\_\_\_.

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 3) Which is not a type of intellectual property?

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 4) In which article is intellectual property rights outlined?

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 5) How long does intellectual property last? (after the death of the author)

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 6) Which of the following can you copyright?

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion
- 7) Which of the following identifies as a trademark?

a) Name, symbol	b) Symbol, logo
c) Logo, name	d) Name, symbol, logo
- 8) What is the subject matter of a patent?

a) Art	b) Invention
c) Goods	d) Ideas
- 9) What is copyright meant for?

a) Film work	b) Books
c) Essay	d) All of these

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and  
Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks



- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two)** **20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four)** **20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**CIVIL ENGINEERING  
Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement

<b>Seat No.</b>	
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**Set****P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**CIVIL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Four)**

**16**

- a) Explain nature and types of status.
- b) What demographic changes are observed in Indian population?
- c) Explain the meaning and features of socialization.
- d) Write on meaning and nature of Modernization.
- e) What is the radical movement?
- f) What are bases of a community?

**Q.3 a) Explain the meaning and characteristics of human society.**

**12**

**OR**

**b) What are the major trends in urbanization in developing countries?**

**Q.4 Explain the causes and consequences of environmental degradation.**

**12**

<b>Seat No.</b>	
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# CIVIL ENGINEERING

## Introduction to Sociology

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks:10

10

- 1) What is the percentage of potable water on the earth?

a) 2%	b) 3%
c) 5%	d) 7%
- 2) Which of the following is the reformist movement?

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 3) Who is the father of Indology?

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 4) What is culture?

a) literature	b) way of life
c) food rituals	d) fashions
- 5) What is social norm?

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 6) What is demography?

a) science of society	b) study of migration
c) science of population	d) study of races
- 7) Which of the following is applicable to tribal community?

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**CIVIL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Four) 16**

- a) Explain nature and types of status.
- b) What demographic changes are observed in Indian population?
- c) Explain the meaning and features of socialization.
- d) Write on meaning and nature of Modernization.
- e) What is the radical movement?
- f) What are bases of a community?

**Q.3 a) Explain the meaning and characteristics of human society. 12**

**OR**

- b) What are the major trends in urbanization in developing countries?

**Q.4 Explain the causes and consequences of environmental degradation. 12**



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 2) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 3) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 5) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 6) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 8) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 9) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 10) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**CIVIL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Four) 16**

- a) Explain nature and types of status.
- b) What demographic changes are observed in Indian population?
- c) Explain the meaning and features of socialization.
- d) Write on meaning and nature of Modernization.
- e) What is the radical movement?
- f) What are bases of a community?

**Q.3 a) Explain the meaning and characteristics of human society. 12**

**OR**

- b) What are the major trends in urbanization in developing countries?

**Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

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3) Figures to the right indicates full marks.

Marks: 10

## 10

- Page 1 of 12

- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

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**Set****P**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Stress and Coping**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_.
- a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
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| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
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| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
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- 3) The following are the characteristics of Positive Stress.
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- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
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  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
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- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
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|------------|--|-----------|
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| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
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| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

### MCQ/Objective Type Questions

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

10

- 1) Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture  
b) Value  
c) Society  
d) Moral
- 2) Virtues are \_\_\_\_\_.  
a) Moral  
b) Ethics  
c) Values  
d) Positive and preferred values
- 3) Honestly is a \_\_\_\_\_.  
a) Virtue  
b) Truthfulness  
c) Trustworthiness  
d) Communication
- 4) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.  
a) Nature  
b) Nurture  
c) World  
d) Universe
- 5) One of the basic desires of every human being is to be always \_\_\_\_\_.  
a) Happy  
b) Sad  
c) Laugh  
d) Earn money
- 6) Courage is the tendency to accept and face \_\_\_\_\_.  
a) Self-confidence  
b) Risks and difficult tasks in rational ways  
c) Physical courage  
d) Social courage
- 7) Commitment means \_\_\_\_\_.  
a) Alignment to goals  
b) Adherence to ethical principles  
c) Empathy  
d) All the above
- 8) The objectives of professional ethics in engineering are  
a) To understand the moral values that ought to guide the Engineering profession  
b) To resolve the moral issues in the profession, and  
c) To justify the moral judgment concerning the profession  
d) All the above

- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
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 a) Culture  
 b) Value  
 c) Society  
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- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

- 9)** Human life is lived at four levels individuals, family, society and \_\_\_\_\_.  
a) Nature                                      b) Nurture  
c) World                                        d) Universe
- 10)** One of the basic desires of every human being is to be always \_\_\_\_\_.  
a) Happy                                        b) Sad  
c) Laugh                                        d) Earn money

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
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**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
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- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
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- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
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  - c) Ethics
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- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
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  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4 Write short notes on any four** **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

Seat No.	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

### MCQ/Objective Type Questions

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

10

- 1) Honestly is a \_\_\_\_\_.  
a) Virtue  
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a) To understand the moral values that ought to guide the Engineering profession  
b) To resolve the moral issues in the profession, and  
c) To justify the moral judgment concerning the profession  
d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
a) Integrity  
b) Work ethic  
c) Personal Values  
d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
a) Confidentiality  
b) Empathy  
c) Ethics  
d) Work ethics



- 9) Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture  
b) Value  
c) Society  
d) Moral
- 10) Virtues are \_\_\_\_\_.  
a) Moral  
b) Ethics  
c) Values  
d) Positive and preferred values

<b>Seat No.</b>	
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**Set**

<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022****CIVIL ENGINEERING****Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Steel Structures**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which of the following is a serviceability criterion?
  - a) Stability against overturning
  - b) Sway stability
  - c) Fire resistance
  - d) Fatigue
- 2) As per IS 800 purlins are designed as a \_\_\_\_\_.
  - a) Simply supported beams
  - b) Cantilever beams
  - c) Continuous beams
  - d) Compression member
- 3) In case of an axially loaded column machined for full bearing, the fastenings connecting the column to the base plate in gusseted base are designed for \_\_\_\_\_.
  - a) 100% of column load
  - b) 50% of column load
  - c) 25% of column load
  - d) Erection loads only
- 4) The self-weight of a roof truss ( $N/m^2$ ) may be obtained by \_\_\_\_\_.
  - a)  $(L + 5)5$
  - b)  $(L/3 + 5)10$
  - c)  $(L - 5)5$
  - d)  $(L/3 - 5)10$
- 5) Anchor bolts are provided in column base to \_\_\_\_\_.
  - i) Resist the tension forces
  - ii) Fix columns in place during erection
  - iii) Serve as reinforcement in concrete pedestal below the base plate of the above
  - a) i, ii are correct
  - b) ii, iii are correct
  - c) iii and i are correct
  - d) all are correct
- 6) The partial safety factor for the material of bolts is \_\_\_\_\_.
  - a) 1.0
  - b) 1.10
  - c) 1.15
  - d) 1.25
- 7) Which of the following sections has a minimum value of shape factor?
  - a) Rectangle
  - b) Tube section
  - c) Circle
  - d) I section
- 8) The slenderness ratio of lacing flat is limited to \_\_\_\_\_.
  - a) 350
  - b) 145
  - c) 180
  - d) 250

- 9) The best double angle compression member section is \_\_\_\_\_.  
a) Equal angle on same side of gusset  
b) Unequal angles with long legs back-to-back  
c) Unequal angles with short legs back-to-back  
d) Equal angle on opposite side of gusset plate
- 10) What is the minimum pitch distance according to IS 800:2007 if  $d$  is the bolt diameter?  
a)  $2d$   
b)  $d$   
c)  $1.7d$   
d)  $2.5d$
- 11) The effective length of a structural steel compression member of length  $L$  effectively held in position and restrained against rotation at one end but neither held in position nor restrained against rotation at the other end, is \_\_\_\_\_.  
a)  $2L$   
b)  $1.2L$   
c)  $0.8L$   
d)  $L$
- 12) Splices for compression members are designed as \_\_\_\_\_.  
a) Short column  
b) Intermediate column  
c) Long column  
d) Depends upon its thickness
- 13) Minimum number of battens required in a built-up column are \_\_\_\_\_.  
a) 2  
b) 3  
c) 4  
d) 6
- 14) A frame has an indeterminacy of 2 and the numbers of possible plastic hinges are 3. The collapse will be \_\_\_\_\_.  
a) Partial  
b) Complete  
c) Over complete  
d) Cannot be ascertained

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Steel Structures**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

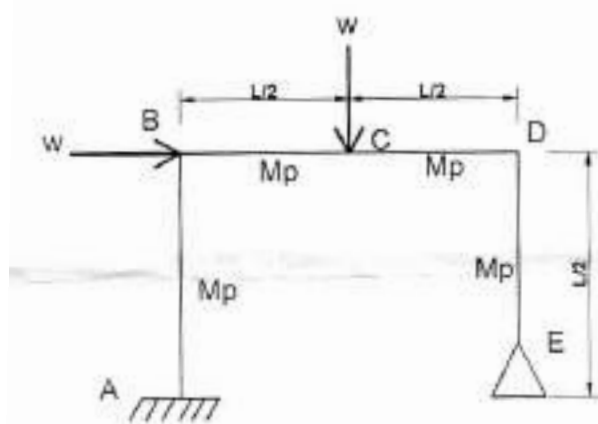
- Instructions:** 1) Solve any 3 questions from each section. Q.2 and Q.6 are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of scientific non programmable calculator is allowed.  
 4) Draw the appropriate sketches wherever necessary.  
 5) Assume suitable data if necessary and mention it clearly before the solution.  
 6) Use of IS 800-2007 & IS 875 are allowed, but not allowed for MCQ (Q.1)

**Section – I**

- Q.2**   **a)**   Explain the advantages and disadvantages of steel structures. **05**  
           **b)**   A ground floor column is subjected to following service loads: **05**  
                   Dead load: 500 kN axial compression  
                   Live load: 250 kN axial compression  
                   Wind load: 150 kN axial compression  
                   Determine the design load combination for limit state of strength and limit state of serviceability.
- Q.3**   Design a bridge truss diagonal subjected to a factored tensile load of 290 kN. **09**  
           Length of diagonal is 3 m. The tension member is connected to gusset plate of 16 mm thick. Use 20 mm diameter bolts of grade 4.6
- Q.4**   Design a double angle discontinuous strut to carry a factored load of 145 kN, **09**  
           resulting from combination with wind load. The length of the strut is 2.8 m between intersections. The two angles are placed back-to-back (with long legs connected) and are tack bolted. Use steel of grade Fe410.  
           **a)**   Angles are placed on opposite sides of 12 mm gusset plate  
           **b)**   Angles are placed on same side of 12 mm gusset plate
- Q.5**   Design a battened column with two channels back-to-back of length 7 m to **09**  
           carry an axial factored load of 900kN. The column may be assumed to have restrained in position but not restrained in direction at both ends.

## Section – II

- Q.6** A portal frame ABCD fixed at A and hinged at D and subjected to two-point loads  $W$  acting at midpoint of BC and at B respectively. Take  $AB = L/2$ ,  $BC = L/2$ ,  $CD = L/2$  and  $DE = L/2$ . Also take the plastic moment capacity of  $AB = M_p$ ,  $BC = M_p$  and  $CD = M_p$ . Find the collapse load for the portal frame also draw the plastic moment diagram **10**



- Q.7** A simply supported steel joist of 4.0 m effective span is laterally supported throughout. It carries a total uniformly distributed load of 35 kN (inclusive of self weight) Design an appropriate section using steel of grade Fe 410. **09**
- Q.8** Design I section purlin to support galvanized corrugated iron sheet roof truss of span 12 m. The purlins are 1.5 m apart over roof trusses spaced 6 m center to center. The roof surface has an inclination of  $30^\circ$  to horizontal. The weight of corrugated iron sheet is  $0.133 \text{ kN/m}^2$ . The weight of fixtures etc. is  $0.055 \text{ kN/m}^2$  intensity of wind pressure for the medium permeability is  $1.8 \text{ kN/m}^2$  use grade of steel Fe 410. **09**
- Q.9** A column section ISHB 350 @ 661.2 N/m carries a factored axial compressive load of 1500kN and factored bending moment of 80kN-m. Design the base plate and its connection assume concrete pedestal of M20 grade. **09**

<b>Seat No.</b>	
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Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.

### MCQ/Objective Type Questions

Marks: 14

14

- Page 5 of 16

- 9) As per IS 800 purlins are designed as a \_\_\_\_\_.  
a) Simply supported beams      b) Cantilever beams  
c) Continuous beams      d) Compression member
- 10) In case of an axially loaded column machined for full bearing, the fastenings connecting the column to the base plate in gusseted base are designed for \_\_\_\_\_.  
a) 100% of column load      b) 50% of column load  
c) 25% of column load      d) Erection loads only
- 11) The self-weight of a roof truss ( $N/m^2$ ) may be obtained by \_\_\_\_\_.  
a)  $(L + 5)5$       b)  $(L/3 + 5)10$   
c)  $(L - 5)5$       d)  $(L/3 - 5)10$
- 12) Anchor bolts are provided in column base to \_\_\_\_\_.  
i) Resist the tension forces  
ii) Fix columns in place during erection  
iii) Serve as reinforcement in concrete pedestal below the base plate of the above  
a) i, ii are correct      b) ii, iii are correct  
c) iii and i are correct      d) all are correct
- 13) The partial safety factor for the material of bolts is \_\_\_\_\_.  
a) 1.0      b) 1.10  
c) 1.15      d) 1.25
- 14) Which of the following sections has a minimum value of shape factor?  
a) Rectangle      b) Tube section  
c) Circle      d) I section



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Steel Structures**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

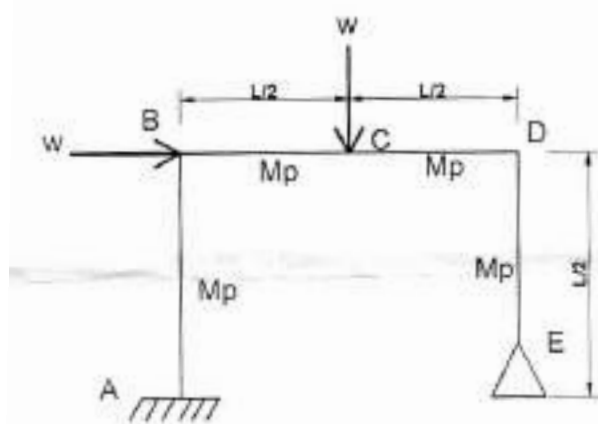
- Instructions:** 1) Solve any 3 questions from each section. Q.2 and Q.6 are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of scientific non programmable calculator is allowed.  
 4) Draw the appropriate sketches wherever necessary.  
 5) Assume suitable data if necessary and mention it clearly before the solution.  
 6) Use of IS 800-2007 & IS 875 are allowed, but not allowed for MCQ (Q.1)

**Section – I**

- Q.2**   **a)**   Explain the advantages and disadvantages of steel structures. **05**  
           **b)**   A ground floor column is subjected to following service loads: **05**  
                   Dead load: 500 kN axial compression  
                   Live load: 250 kN axial compression  
                   Wind load: 150 kN axial compression  
                   Determine the design load combination for limit state of strength and limit state of serviceability.
- Q.3**   Design a bridge truss diagonal subjected to a factored tensile load of 290 kN. **09**  
           Length of diagonal is 3 m. The tension member is connected to gusset plate of 16 mm thick. Use 20 mm diameter bolts of grade 4.6
- Q.4**   Design a double angle discontinuous strut to carry a factored load of 145 kN, **09**  
           resulting from combination with wind load. The length of the strut is 2.8 m between intersections. The two angles are placed back-to-back (with long legs connected) and are tack bolted. Use steel of grade Fe410.  
           **a)**   Angles are placed on opposite sides of 12 mm gusset plate  
           **b)**   Angles are placed on same side of 12 mm gusset plate
- Q.5**   Design a battened column with two channels back-to-back of length 7 m to **09**  
           carry an axial factored load of 900kN. The column may be assumed to have restrained in position but not restrained in direction at both ends.

## Section – II

- Q.6** A portal frame ABCD fixed at A and hinged at D and subjected to two-point loads  $W$  acting at midpoint of BC and at B respectively. Take  $AB = L/2$ ,  $BC = L/2$ ,  $CD = L/2$  and  $DE = L/2$ . Also take the plastic moment capacity of  $AB = M_p$ ,  $BC = M_p$  and  $CD = M_p$ . Find the collapse load for the portal frame also draw the plastic moment diagram **10**



- Q.7** A simply supported steel joist of 4.0 m effective span is laterally supported throughout. It carries a total uniformly distributed load of 35 kN (inclusive of self weight) Design an appropriate section using steel of grade Fe 410. **09**
- Q.8** Design I section purlin to support galvanized corrugated iron sheet roof truss of span 12 m. The purlins are 1.5 m apart over roof trusses spaced 6 m center to center. The roof surface has an inclination of  $30^\circ$  to horizontal. The weight of corrugated iron sheet is  $0.133 \text{ kN/m}^2$ . The weight of fixtures etc. is  $0.055 \text{ kN/m}^2$  intensity of wind pressure for the medium permeability is  $1.8 \text{ kN/m}^2$  use grade of steel Fe 410. **09**
- Q.9** A column section ISHB 350 @  $661.2 \text{ N/m}$  carries a factored axial compressive load of  $1500 \text{ kN}$  and factored bending moment of  $80 \text{ kN-m}$ . Design the base plate and its connection assume concrete pedestal of M20 grade. **09**

<b>Seat No.</b>	
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Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

14

- [illegible]

- 9) Anchor bolts are provided in column base to \_\_\_\_\_.  
i) Resist the tension forces  
ii) Fix columns in place during erection  
iii) Serve as reinforcement in concrete pedestal below the base plate of the above  
a) i, ii are correct  
b) ii, iii are correct  
c) iii and i are correct  
d) all are correct
- 10) The partial safety factor for the material of bolts is \_\_\_\_\_.  
a) 1.0  
b) 1.10  
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- 11) Which of the following sections has a minimum value of shape factor?  
a) Rectangle  
b) Tube section  
c) Circle  
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- 12) The slenderness ratio of lacing flat is limited to \_\_\_\_\_.  
a) 350  
b) 145  
c) 180  
d) 250
- 13) The best double angle compression member section is \_\_\_\_\_.  
a) Equal angle on same side of gusset  
b) Unequal angles with long legs back-to-back  
c) Unequal angles with short legs back-to-back  
d) Equal angle on opposite side of gusset plate
- 14) What is the minimum pitch distance according to IS 800:2007 if  $d$  is the bolt diameter?  
a)  $2d$   
b)  $d$   
c)  $1.7d$   
d)  $2.5d$

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Steel Structures**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

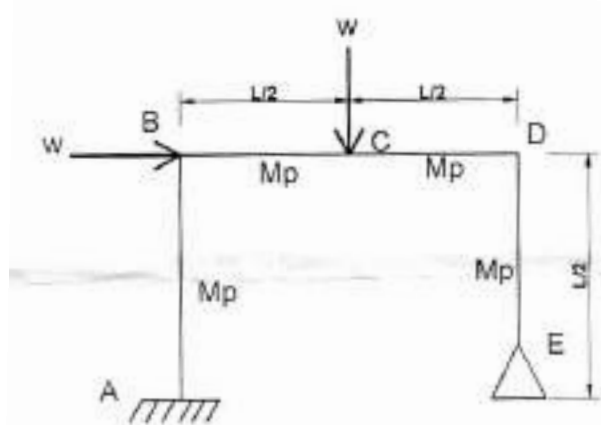
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**Section – I**

- Q.2**   **a)**   Explain the advantages and disadvantages of steel structures. **05**  
           **b)**   A ground floor column is subjected to following service loads: **05**  
                   Dead load: 500 kN axial compression  
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- Q.3**   Design a bridge truss diagonal subjected to a factored tensile load of 290 kN. **09**  
           Length of diagonal is 3 m. The tension member is connected to gusset plate of 16 mm thick. Use 20 mm diameter bolts of grade 4.6
- Q.4**   Design a double angle discontinuous strut to carry a factored load of 145 kN, **09**  
           resulting from combination with wind load. The length of the strut is 2.8 m between intersections. The two angles are placed back-to-back (with long legs connected) and are tack bolted. Use steel of grade Fe410.  
           **a)**   Angles are placed on opposite sides of 12 mm gusset plate  
           **b)**   Angles are placed on same side of 12 mm gusset plate
- Q.5**   Design a battened column with two channels back-to-back of length 7 m to **09**  
           carry an axial factored load of 900kN. The column may be assumed to have restrained in position but not restrained in direction at both ends.

## Section – II

- Q.6** A portal frame ABCD fixed at A and hinged at D and subjected to two-point loads  $W$  acting at midpoint of BC and at B respectively. Take  $AB = L/2$ ,  $BC = L/2$ ,  $CD = L/2$  and  $DE = L/2$ . Also take the plastic moment capacity of  $AB = M_p$ ,  $BC = M_p$  and  $CD = M_p$ . Find the collapse load for the portal frame also draw the plastic moment diagram **10**



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- Q.9** A column section ISHB 350 @ 661.2 N/m carries a factored axial compressive load of 1500kN and factored bending moment of 80kN-m. Design the base plate and its connection assume concrete pedestal of M20 grade. **09**

<b>Seat No.</b>	
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Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
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Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

14

- 1) The partial safety factor for the material of bolts is \_\_\_\_\_.  
a) 1.0                                      b) 1.10  
c) 1.15                                      d) 1.25
- 2) Which of the following sections has a minimum value of shape factor?  
a) Rectangle                                b) Tube section  
c) Circle                                      d) I section
- 3) The slenderness ratio of lacing flat is limited to \_\_\_\_\_.  
a) 350    b) 145  
c) 180    d) 250
- 4) The best double angle compression member section is \_\_\_\_\_.  
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- 6) The effective length of a structural steel compression member of length  $L$  effectively held in position and restrained against rotation at one end but neither held in position nor restrained against rotation at the other end, is \_\_\_\_\_.  
a)  $2L$     b)  $1.2L$   
c)  $0.8L$                                         d)  $L$
- 7) Splices for compression members are designed as \_\_\_\_\_.  
a) Short column                              b) Intermediate column  
c) Long column                                d) Depends upon its thickness
- 8) Minimum number of battens required in a built-up column are \_\_\_\_\_.  
a) 2    b) 3  
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- 9) A frame has an indeterminacy of 2 and the numbers of possible plastic hinges are 3. The collapse will be \_\_\_\_\_.
  - a) Partial
  - b) Complete
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- 10) Which of the following is a serviceability criterion?
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  - a)  $(L + 5)5$
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  - i) Resist the tension forces
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  - a) i, ii are correct
  - b) ii, iii are correct
  - c) iii and i are correct
  - d) all are correct



<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Steel Structures**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

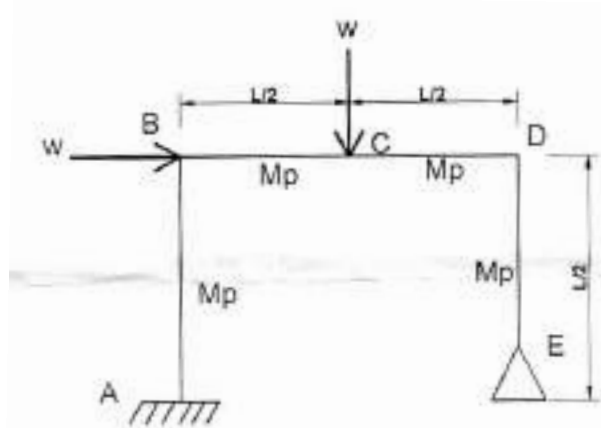
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 5) Assume suitable data if necessary and mention it clearly before the solution.  
 6) Use of IS 800-2007 & IS 875 are allowed, but not allowed for MCQ (Q.1)

**Section – I**

- Q.2**   **a)**   Explain the advantages and disadvantages of steel structures. **05**  
           **b)**   A ground floor column is subjected to following service loads: **05**  
                   Dead load: 500 kN axial compression  
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                   Wind load: 150 kN axial compression  
                   Determine the design load combination for limit state of strength and limit state of serviceability.
- Q.3**   Design a bridge truss diagonal subjected to a factored tensile load of 290 kN. **09**  
           Length of diagonal is 3 m. The tension member is connected to gusset plate of 16 mm thick. Use 20 mm diameter bolts of grade 4.6
- Q.4**   Design a double angle discontinuous strut to carry a factored load of 145 kN, **09**  
           resulting from combination with wind load. The length of the strut is 2.8 m between intersections. The two angles are placed back-to-back (with long legs connected) and are tack bolted. Use steel of grade Fe410.  
           **a)**   Angles are placed on opposite sides of 12 mm gusset plate  
           **b)**   Angles are placed on same side of 12 mm gusset plate
- Q.5**   Design a battened column with two channels back-to-back of length 7 m to **09**  
           carry an axial factored load of 900kN. The column may be assumed to have restrained in position but not restrained in direction at both ends.

**Section – II**

- Q.6** A portal frame ABCD fixed at A and hinged at D and subjected to two-point loads  $W$  acting at midpoint of BC and at B respectively. Take  $AB = L/2$ ,  $BC = L/2$ ,  $CD = L/2$  and  $DE = L/2$ . Also take the plastic moment capacity of  $AB = M_p$ ,  $BC = M_p$  and  $CD = M_p$ . Find the collapse load for the portal frame also draw the plastic moment diagram **10**



- Q.7** A simply supported steel joist of 4.0 m effective span is laterally supported throughout. It carries a total uniformly distributed load of 35 kN (inclusive of self weight) Design an appropriate section using steel of grade Fe 410. **09**
- Q.8** Design I section purlin to support galvanized corrugated iron sheet roof truss of span 12 m. The purlins are 1.5 m apart over roof trusses spaced 6 m center to center. The roof surface has an inclination of  $30^\circ$  to horizontal. The weight of corrugated iron sheet is  $0.133 \text{ kN/m}^2$ . The weight of fixtures etc. is  $0.055 \text{ kN/m}^2$  intensity of wind pressure for the medium permeability is  $1.8 \text{ kN/m}^2$  use grade of steel Fe 410. **09**
- Q.9** A column section ISHB 350 @  $661.2 \text{ N/m}$  carries a factored axial compressive load of  $1500 \text{ kN}$  and factored bending moment of  $80 \text{ kN-m}$ . Design the base plate and its connection assume concrete pedestal of M20 grade. **09**

<b>Seat No.</b>	
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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.

2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

3) Assume suitable data wherever needed and mention it clearly.

## Marks: 14

14

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Set	P
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov 2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 and Q. No. 6 is compulsory, attempt any Two questions from the remaining questions from each section I and section II.  
 2) Assume additional data, if required, and state it clearly.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any Four.** **08**
- Draw grain size distribution curve and show  $D_{10}$ ,  $D_{30}$ , and  $D_{60}$  on it.
  - Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
  - Define air content and degree of saturation.
  - Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
  - Draw graph used to calculate liquid limit for soil and show liquid limit on it.
- Q.3 Answer the following questions.**
- With suitable notation prove the relation  $e = \frac{wG}{S_r}$  **05**
  - A soil sample has equal amounts of voids and solids, and also amount of air and water in terms of volume is same; for this soil find **05**
    - void ratio of the soil
    - porosity
    - air content
    - % air void and
    - degree of saturation
- Q.4 Answer the following questions.**
- What is permeability of soil? Explain any four factors affecting permeability of soil. **05**
  - Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient permeability of  $2 \times 10^{-3}$ ,  $1.5 \times 10^{-3}$  and  $3 \times 10^{-3}$  cm/s respectively. Estimate the average coefficient of permeability in the direction of **05**
    - Parallel to the bedding plane
    - Normal to the bedding plane
- Q.5 Answer the following questions.**
- What are different types of shear test based on drainage of soil. **05**
  - Consolidated undrained test were carried out on a soil sample and following observations were recorded. **05**

Test	Cell Pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure?

## Section – II

**Q.6 Attempt any Four.****08**

- Define Maximum dry density and optimum moisture content.
- Define over-consolidation ratio and how it is used to classify the soil.
- Draw compaction curve along with zero air void line (label all parts).
- Draw typical  $e - p$  curve and label various parts of it.
- Write any four analogy between spring model and saturated soil (consolidation).

**Q.7 Answer the following questions.**

- Explain step wise procedure for field compaction of soil. **05**
- The following are the results of a standard compaction test performed on a sample of soil. **05**

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (Kg)	1.7	1.89	2.05	1.99	1.99	1.92

- Plot compaction curve and hence find OMC and MDD
- Plot 10% air void line
- What is the air content and degree of saturation corresponding to MDD?

**Q.8 Answer the following questions.**

- Explain Cassagrande method for calculating coefficient of consolidation. **05**
- A clay specimen was tested in a laboratory consolidation device, which was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following: **05**
  - Time for 50% consolidation in the field with this soil with a 2.5 m thickness where only the top layer is drained
  - Time for 90% consolidation in the field with this soil with a 2.5 m thickness where only the top layer is drained

**Q.9 Answer the following questions.**

- Explain Culman's method for calculating earth pressure. **05**
- Calculate total passive earth pressure and its position with respect to bottom of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having  $\gamma = 18 \text{ kN/m}^3$ ,  $c = 0$  and  $\phi = 27^\circ$  followed by second layer having  $\gamma = 19 \text{ kN/m}^3$ ,  $c = 0$  and  $\phi = 30^\circ$  **05**

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov 2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In compaction test graph is plotted between water content and \_\_\_\_ density of soil.
 

a) Bulk	b) Submerged
c) Dry	d) Soil solid
- 2) Process of removal of water from the soil is called \_\_\_\_\_.
 

a) compaction	b) consolidation
c) compression	d) none
- 3) Graphical method for finding earth pressure is given by \_\_\_\_\_.
 

a) Terzaghi	b) Cassagrande
c) Boussinesq	d) Culman
- 4) Vane shear test is commonly used to find shear strength of \_\_\_\_\_ soil.
 

a) clayey	b) sandy
c) silty	d) soft clayey soil
- 5) Height of fall of rammer in modified compaction test is \_\_\_\_\_.
 

a) 250mm	b) 310mm
c) 400mm	d) 450mm
- 6) Which of following shear strength test is quick one \_\_\_\_\_?
 

a) UU test	b) CU test
c) CD test	d) none
- 7) Standard size of soil sample used for conducting unconfined compression test is \_\_\_\_\_.
 

a) 30mm dia. And 60mm height	b) 38mm dia. and 76mm height
------------------------------	------------------------------
- 8) If solid portion and void portion in a given mass of soil is same then porosity for this soil is \_\_\_\_\_.
 

a) 1	b) 0.75
c) 0.50	d) 0.25

- 9) Which factors do not affect the permeability of soil \_\_\_\_\_?  
a) shape of soil particle                      b) size of soil particle  
c) specific gravity                              d) porosity
- 10) Optimum moisture content of which soil is more at a given compaction effort \_\_\_\_\_.  
a) silt    b) clay  
c) sand     d) sandy clay
- 11) Which roller is most suitable for compacting clayey soil?  
a) Pneumatic                                    b) Vibratory  
c) Sheep foot                                   d) Smooth wheel
- 12) Coefficient of volume compressibility is the slope of which of following curve \_\_\_\_\_.  
a)  $e - p$  curve                                  b)  $e - \log p$  curve  
c) flow curve                                    d) none
- 13) If the soil is dry then percentage air void for this soil is \_\_\_\_\_.  
a) 1    b) 0  
c) 0.50     d) none
- 14) Permeability of the soil is more when the degree of saturation of soil is \_\_\_\_\_.  
a) 0%    b) 25%  
c) 50%     d) 100%



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Set	Q
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov 2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 and Q. No. 6 is compulsory, attempt any Two questions from the remaining questions from each section I and section II.  
 2) Assume additional data, if required, and state it clearly.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.** **08**

- Draw grain size distribution curve and show  $D_{10}$ ,  $D_{30}$ , and  $D_{60}$  on it.
- Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
- Define air content and degree of saturation.
- Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
- Draw graph used to calculate liquid limit for soil and show liquid limit on it.

**Q.3 Answer the following questions.**

- With suitable notation prove the relation  $e = \frac{wG}{S_r}$  **05**
- A soil sample has equal amounts of voids and solids, and also amount of air and water in terms of volume is same; for this soil find **05**
  - void ratio of the soil
  - porosity
  - air content
  - % air void and
  - degree of saturation

**Q.4 Answer the following questions.**

- What is permeability of soil? Explain any four factors affecting permeability of soil. **05**
- Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient permeability of  $2 \times 10^{-3}$ ,  $1.5 \times 10^{-3}$  and  $3 \times 10^{-3}$  cm/s respectively. Estimate the average coefficient of permeability in the direction of **05**
  - Parallel to the bedding plane
  - Normal to the bedding plane

**Q.5 Answer the following questions.**

- What are different types of shear test based on drainage of soil. **05**
- Consolidated undrained test were carried out on a soil sample and following observations were recorded. **05**

Test	Cell Pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure?

## Section – II

**Q.6 Attempt any Four.****08**

- Define Maximum dry density and optimum moisture content.
- Define over-consolidation ratio and how it is used to classify the soil.
- Draw compaction curve along with zero air void line (label all parts).
- Draw typical  $e - p$  curve and label various parts of it.
- Write any four analogy between spring model and saturated soil (consolidation).

**Q.7 Answer the following questions.**

- Explain step wise procedure for field compaction of soil. **05**
- The following are the results of a standard compaction test performed on a sample of soil. **05**

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (Kg)	1.7	1.89	2.05	1.99	1.99	1.92

- Plot compaction curve and hence find OMC and MDD
- Plot 10% air void line
- What is the air content and degree of saturation corresponding to MDD?

**Q.8 Answer the following questions.**

- Explain Cassagrande method for calculating coefficient of consolidation. **05**
- A clay specimen was tested in a laboratory consolidation device, which was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following: **05**
  - Time for 50% consolidation in the field with this soil with a 2.5 m thickness where only the top layer is drained
  - Time for 90% consolidation in the field with this soil with a 2.5 m thickness where only the top layer is drained

**Q.9 Answer the following questions.**

- Explain Culman's method for calculating earth pressure. **05**
- Calculate total passive earth pressure and its position with respect to bottom of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having  $\gamma = 18 \text{ kN/m}^3$ ,  $c = 0$  and  $\phi = 27^\circ$  followed by second layer having  $\gamma = 19 \text{ kN/m}^3$ ,  $c = 0$  and  $\phi = 30^\circ$  **05**

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov 2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) Vane shear test is commonly used to find shear strength of \_\_\_\_\_ soil.
  - a) clayey
  - b) sandy
  - c) silty
  - d) soft clayey soil
- 2) Height of fall of rammer in modified compaction test is \_\_\_\_\_.
  - a) 250mm
  - b) 310mm
  - c) 400mm
  - d) 450mm
- 3) Which of following shear strength test is quick one \_\_\_\_\_?
  - a) UU test
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- 4) Standard size of soil sample used for conducting unconfined compression test is \_\_\_\_\_.
  - a) 30mm dia. And 60mm height
  - b) 38mm dia. and 76mm height
- 5) If solid portion and void portion in a given mass of soil is same then porosity for this soil is \_\_\_\_\_.
  - a) 1
  - b) 0.75
  - c) 0.50
  - d) 0.25
- 6) Which factors do not affect the permeability of soil \_\_\_\_\_?
  - a) shape of soil particle
  - b) size of soil particle
  - c) specific gravity
  - d) porosity
- 7) Optimum moisture content of which soil is more at a given compaction effort \_\_\_\_\_.
  - a) silt
  - b) clay
  - c) sand
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- 8) Which roller is most suitable for compacting clayey soil?
  - a) Pneumatic
  - b) Vibratory
  - c) Sheep foot
  - d) Smooth wheel



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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov 2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 and Q. No. 6 is compulsory, attempt any Two questions from the remaining questions from each section I and section II.  
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**Section – I**

- Q.2 Attempt any Four.** **08**
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- Q.3 Answer the following questions.**
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    - air content
    - % air void and
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- Q.4 Answer the following questions.**
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  - Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient permeability of  $2 \times 10^{-3}$ ,  $1.5 \times 10^{-3}$  and  $3 \times 10^{-3}$  cm/s respectively. Estimate the average coefficient of permeability in the direction of **05**
    - Parallel to the bedding plane
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- Q.5 Answer the following questions.**
- What are different types of shear test based on drainage of soil. **05**
  - Consolidated undrained test were carried out on a soil sample and following observations were recorded. **05**

Test	Cell Pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure?

## Section – II

**Q.6 Attempt any Four.****08**

- Define Maximum dry density and optimum moisture content.
- Define over-consolidation ratio and how it is used to classify the soil.
- Draw compaction curve along with zero air void line (label all parts).
- Draw typical  $e - p$  curve and label various parts of it.
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**Q.7 Answer the following questions.**

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<b>Seat No.</b>	
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Set	S
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov 2022**  
**CIVIL ENGINEERING**  
**Geotechnical Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 and Q. No. 6 is compulsory, attempt any Two questions from the remaining questions from each section I and section II.  
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**Section – I**

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- Draw grain size distribution curve and show  $D_{10}$ ,  $D_{30}$ , and  $D_{60}$  on it.
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Test	Cell Pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
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Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure?

## Section – II

**Q.6 Attempt any Four.****08**

- Define Maximum dry density and optimum moisture content.
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**Q.9 Answer the following questions.**

- Explain Culman's method for calculating earth pressure. **05**
- Calculate total passive earth pressure and its position with respect to bottom of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having  $\gamma = 18 \text{ kN/m}^3$ ,  $c = 0$  and  $\phi = 27^\circ$  followed by second layer having  $\gamma = 19 \text{ kN/m}^3$ ,  $c = 0$  and  $\phi = 30^\circ$  **05**

<b>Seat No.</b>	
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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

## Marks: 14

14

- Page 1 of 16

- 9) Which is the odd one out?
- a) Deep well injection
  - b) Landfilling
  - c) Land Farming
  - d) Composting
- 10) Which of the following can be collected from landfills?
- a) Leachate
  - b) Gas
  - c) Both a) and b)
  - d) None of the above
- 11) In composting by trenching trenches of \_\_\_\_\_ m length are excavated.
- a) 4-10
  - b) 7-12
  - c) 10-20
  - d) Above 20
- 12) Controlled tipping method of disposal of refuse requires an area of \_\_\_\_\_  $\text{m}^2/\text{c}/\text{yr}$ .
- a) 0.1-0.3
  - b) 0.3-0.5
  - c) 0.5- 1.0
  - d) 1.0- 1.2
- 13) Which type of pollutant does Ozone belong to?
- a) Primary
  - b) Secondary
  - c) Natural
  - d) None of the above
- 14) The coning plume from the stacks is observed in \_\_\_\_\_ type of atmosphere.
- a) Stable
  - b) Unstable
  - c) Inversion
  - d) Neutral

Seat No.	
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Set **P**

**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**Civil Engineering**  
**Waste Water Engineering & Air Pollution**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) In Section – I, Q. No. 2 is compulsory and solve any two questions from the remaining questions i.e. Q. No. 3, 4, & 5  
 2) In Section – II, Q. No. 6 is compulsory and solve any two questions from the remaining questions i.e. Q. No. 7, 8, & 9  
 3) Figures to the right indicate full marks  
 4) Assume suitable data wherever needed & mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**Section - I**

**Q.2 Answer the following questions.**

- a) Explain biological process in trickling filter with sketch. **05**  
 b) The BOD of a sewage incubated for one day at 25° C has been found to be 150 mg/L. What will be the 5- day 20°C BOD. Assume K – 0.12 (Base 10) at 20° C. **05**

**Q.3 Answer the following questions.**

- a) A town has a population of 1,00,000 persons with per capita water supply of 200 litres/day. Assuming 80% of water usage is appears to be sewage, design a sewer running 0.7 times full at maximum discharge. Take a constant value of N= 0.013 at all depths of flow. The sewer is to be laid at a slope of 1 in 500. Take a peak factor of 3. **05**  
 b) Write advantages and disadvantages of stabilization pond. **04**

**Q.4 Answer the following questions.**

- A continuous flow completely stirred ASP is designed with following data- **09**  
 i. Wastewater discharge - 4000 m<sup>3</sup>/d  
 ii. Standard BOD of influent - 300 mg/L  
 iii. Effluent BOD - 35 mg/L  
 iv. MLSS - 2500 mg/L  
 v. Sludge age - 10 days  
 vi. Y - 0.65  
 vii. K<sub>d</sub> - 0.05  
 Find:  
 a) Reactor volume  
 b) F/M Ratio  
 c) Oxygen requirement

**Q.5 Write short notes on following (any three):**

- a) Septic tank  
 b) Grit chamber  
 c) Disposal of sludge  
 d) Anaerobic pond

**09**

**Section - II**

- Q.6** a) Discuss the procedure involved in 'self-purification' of stream. **05**  
b) A stream, saturated with DO has flow of  $1.2 \text{ m}^3/\text{s}$ , BOD of  $4 \text{ mg/L}$  and rate constant of 0.3 per day. It receives an effluent discharge of  $0.25 \text{ m}^3/\text{s}$ . Having BOD  $20 \text{ mg/L}$ , DO  $5 \text{ mg/L}$  and rate constant 0.13 per day. The average velocity of flow of the stream is  $0.15 \text{ m/s}$ . Calculate the DO deficit at point 20 km & 40 km downstream. Assume that the temperature is  $20^\circ\text{C}$  throughout and BOD is measured at 5 days. Take saturation DO at  $20^\circ\text{C}$  as  $9.17 \text{ mg/L}$ . **05**
- Q.7** a) With the help of diagram explain constructed wetlands. **05**  
b) List different composting methods and explain 'Bangalore method' of composting. **04**
- Q.8** a) Explain functional outlines for solid waste disposal. **05**  
b) Illustrate the classification of solid wastes based on various types. **04**
- Q.9** Write short notes on following (any three): **09**  
a) ESP  
b) Ozone Depletion  
c) Decentralized treatment systems  
d) Cyclone Precipitator

Seat No.	
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## Waste Water Engineering & Air Pollution

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

4) Assume suitable data wherever needed and mention it clearly.

### MCQ/Objective Type Questions

Marks: 14

14

- [illegible]

- 9) Which is the odd one out?  
a) Deep well injection                      b) Landfilling  
c) Land Farming                              d) Composting
- 10) Which of the following can be collected from landfills?  
a) Leachate                                      b) Gas  
c) Both a) and b)                              d) None of the above
- 11) In composting by trenching trenches of \_\_\_\_\_ m length are excavated.  
a) 4-10    b) 7-12  
c) 10-20    d) Above 20
- 12) Controlled tipping method of disposal of refuse requires an area of \_\_\_\_\_  $\text{m}^2/\text{c}/\text{yr}$ .  
a) 0.1-0.3    b) 0.3-0.5  
c) 0.5- 1.0    d) 1.0- 1.2
- 13) Which type of pollutant does Ozone belong to?  
a) Primary    b) Secondary  
c) Natural    d) None of the above
- 14) The coning plume from the stacks is observed in \_\_\_\_\_ type of atmosphere.  
a) Stable    b) Unstable  
c) Inversion    d) Neutral



Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**Civil Engineering**  
**Waste Water Engineering & Air Pollution**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) In Section – I, Q. No. 2 is compulsory and solve any two questions from the remaining questions i.e. Q. No. 3, 4, & 5  
 2) In Section – II, Q. No. 6 is compulsory and solve any two questions from the remaining questions i.e. Q. No. 7, 8, & 9  
 3) Figures to the right indicate full marks  
 4) Assume suitable data wherever needed & mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**Section - I**

**Q.2 Answer the following questions.**

- a) Explain biological process in trickling filter with sketch. **05**  
 b) The BOD of a sewage incubated for one day at 25° C has been found to be 150 mg/L. What will be the 5- day 20°C BOD. Assume K – 0.12 (Base 10) at 20° C. **05**

**Q.3 Answer the following questions.**

- a) A town has a population of 1,00,000 persons with per capita water supply of 200 litres/day. Assuming 80% of water usage is appears to be sewage, design a sewer running 0.7 times full at maximum discharge. Take a constant value of N= 0.013 at all depths of flow. The sewer is to be laid at a slope of 1 in 500. Take a peak factor of 3. **05**  
 b) Write advantages and disadvantages of stabilization pond. **04**

**Q.4 Answer the following questions.**

- A continuous flow completely stirred ASP is designed with following data- **09**  
 i. Wastewater discharge - 4000 m<sup>3</sup>/d  
 ii. Standard BOD of influent - 300 mg/L  
 iii. Effluent BOD - 35 mg/L  
 iv. MLSS - 2500 mg/L  
 v. Sludge age - 10 days  
 vi. Y - 0.65  
 vii. K<sub>d</sub> - 0.05  
 Find:  
 a) Reactor volume  
 b) F/M Ratio  
 c) Oxygen requirement

**Q.5 Write short notes on following (any three):**

- a) Septic tank  
 b) Grit chamber  
 c) Disposal of sludge  
 d) Anaerobic pond

**09**

**Section - II**

- Q.6** a) Discuss the procedure involved in 'self-purification' of stream. **05**  
b) A stream, saturated with DO has flow of  $1.2 \text{ m}^3/\text{s}$ , BOD of  $4 \text{ mg/L}$  and rate constant of 0.3 per day. It receives an effluent discharge of  $0.25 \text{ m}^3/\text{s}$ . Having BOD  $20 \text{ mg/L}$ , DO  $5 \text{ mg/L}$  and rate constant 0.13 per day. The average velocity of flow of the stream is  $0.15 \text{ m/s}$ . Calculate the DO deficit at point 20 km & 40 km downstream. Assume that the temperature is  $20^\circ\text{C}$  throughout and BOD is measured at 5 days. Take saturation DO at  $20^\circ\text{C}$  as  $9.17 \text{ mg/L}$ . **05**
- Q.7** a) With the help of diagram explain constructed wetlands. **05**  
b) List different composting methods and explain 'Bangalore method' of composting. **04**
- Q.8** a) Explain functional outlines for solid waste disposal. **05**  
b) Illustrate the classification of solid wastes based on various types. **04**
- Q.9** Write short notes on following (any three): **09**  
a) ESP  
b) Ozone Depletion  
c) Decentralized treatment systems  
d) Cyclone Precipitator

Seat No.	
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## Waste Water Engineering & Air Pollution

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- [illegible]

- 9) Which is the odd one out?
- a) Deep well injection
  - b) Landfilling
  - c) Land Farming
  - d) Composting
- 10) Which of the following can be collected from landfills?
- a) Leachate
  - b) Gas
  - c) Both a) and b)
  - d) None of the above
- 11) In composting by trenching trenches of \_\_\_\_\_ m length are excavated.
- a) 4-10
  - b) 7-12
  - c) 10-20
  - d) Above 20
- 12) Controlled tipping method of disposal of refuse rec cues an area of \_\_\_\_\_ m<sup>2</sup>/c/yr.
- a) 0.1-0.3
  - b) 0.3-0.5
  - c) 0.5- 1.0
  - d) 1.0- 1.2
- 13) Which type of pollutant does Ozone belong to?
- a) Primary
  - b) Secondary
  - c) Natural
  - d) None of the above
- 14) The coning plume from the stacks is observed in \_\_\_\_\_ type of atmosphere.
- a) Stable
  - b) Unstable
  - c) Inversion
  - d) Neutral

Seat No.	
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Set **R**

**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**Civil Engineering**

**Waste Water Engineering & Air Pollution**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:**
- 1) In Section – I, Q. No. 2 is compulsory and solve any two questions from the remaining questions i.e. Q. No. 3, 4, & 5
  - 2) In Section – II, Q. No. 6 is compulsory and solve any two questions from the remaining questions i.e. Q. No. 7, 8, & 9
  - 3) Figures to the right indicate full marks
  - 4) Assume suitable data wherever needed & mention it clearly.
  - 5) Use of non-programmable calculator is allowed.

**Section - I**

**Q.2 Answer the following questions.**

- a) Explain biological process in trickling filter with sketch. **05**
- b) The BOD of a sewage incubated for one day at 25° C has been found to be 150 mg/L. What will be the 5- day 20°C BOD. Assume K – 0.12 (Base 10) at 20° C. **05**

**Q.3 Answer the following questions.**

- a) A town has a population of 1,00,000 persons with per capita water supply of 200 litres/day. Assuming 80% of water usage is appears to be sewage, design a sewer running 0.7 times full at maximum discharge. Take a constant value of N= 0.013 at all depths of flow. The sewer is to be laid at a slope of 1 in 500. Take a peak factor of 3. **05**
- b) Write advantages and disadvantages of stabilization pond. **04**

**Q.4 Answer the following questions.**

- A continuous flow completely stirred ASP is designed with following data- **09**
- i. Wastewater discharge - 4000 m<sup>3</sup>/d
  - ii. Standard BOD of influent - 300 mg/L
  - iii. Effluent BOD - 35 mg/L
  - iv. MLSS - 2500 mg/L
  - v. Sludge age - 10 days
  - vi. Y - 0.65
  - vii. K<sub>d</sub> - 0.05
- Find:
- a) Reactor volume
  - b) F/M Ratio
  - c) Oxygen requirement

**Q.5 Write short notes on following (any three):**

- a) Septic tank
- b) Grit chamber
- c) Disposal of sludge
- d) Anaerobic pond

**09**

**Section - II**

- Q.6** a) Discuss the procedure involved in 'self-purification' of stream. **05**  
b) A stream, saturated with DO has flow of  $1.2 \text{ m}^3/\text{s}$ , BOD of  $4 \text{ mg/L}$  and rate constant of 0.3 per day. It receives an effluent discharge of  $0.25 \text{ m}^3/\text{s}$ . Having BOD  $20 \text{ mg/L}$ , DO  $5 \text{ mg/L}$  and rate constant 0.13 per day. The average velocity of flow of the stream is  $0.15 \text{ m/s}$ . Calculate the DO deficit at point 20 km & 40 km downstream. Assume that the temperature is  $20^\circ\text{C}$  throughout and BOD is measured at 5 days. Take saturation DO at  $20^\circ\text{C}$  as  $9.17 \text{ mg/L}$ . **05**
- Q.7** a) With the help of diagram explain constructed wetlands. **05**  
b) List different composting methods and explain 'Bangalore method' of composting. **04**
- Q.8** a) Explain functional outlines for solid waste disposal. **05**  
b) Illustrate the classification of solid wastes based on various types. **04**
- Q.9** Write short notes on following (any three): **09**  
a) ESP  
b) Ozone Depletion  
c) Decentralized treatment systems  
d) Cyclone Precipitator

<b>Seat No.</b>	
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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 13 of 16

- 9) Which is the odd one out?  
a) Deep well injection                      b) Landfilling  
c) Land Farming                              d) Composting
- 10) Which of the following can be collected from landfills?  
a) Leachate                                      b) Gas  
c) Both a) and b)                              d) None of the above
- 11) In composting by trenching trenches of \_\_\_\_\_ m length are excavated.  
a) 4-10    b) 7-12  
c) 10-20    d) Above 20
- 12) Controlled tipping method of disposal of refuse requires an area of \_\_\_\_\_  $\text{m}^2/\text{c}/\text{yr}$ .  
a) 0.1-0.3    b) 0.3-0.5  
c) 0.5- 1.0    d) 1.0- 1.2
- 13) Which type of pollutant does Ozone belong to?  
a) Primary    b) Secondary  
c) Natural    d) None of the above
- 14) The coning plume from the stacks is observed in \_\_\_\_\_ type of atmosphere.  
a) Stable    b) Unstable  
c) Inversion    d) Neutral



Seat No.	
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Set **S**

**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**Civil Engineering**  
**Waste Water Engineering & Air Pollution**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I, Q. No. 2 is compulsory and solve any two questions from the remaining questions i.e. Q. No. 3, 4, & 5  
 2) In Section – II, Q. No. 6 is compulsory and solve any two questions from the remaining questions i.e. Q. No. 7, 8, & 9  
 3) Figures to the right indicate full marks  
 4) Assume suitable data wherever needed & mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**Section - I**

**Q.2 Answer the following questions.**

- a) Explain biological process in trickling filter with sketch. **05**  
 b) The BOD of a sewage incubated for one day at 25° C has been found to be 150 mg/L. What will be the 5- day 20°C BOD. Assume K – 0.12 (Base 10) at 20° C. **05**

**Q.3 Answer the following questions.**

- a) A town has a population of 1,00,000 persons with per capita water supply of 200 litres/day. Assuming 80% of water usage is appears to be sewage, design a sewer running 0.7 times full at maximum discharge. Take a constant value of N= 0.013 at all depths of flow. The sewer is to be laid at a slope of 1 in 500. Take a peak factor of 3. **05**  
 b) Write advantages and disadvantages of stabilization pond. **04**

**Q.4 Answer the following questions.**

- A continuous flow completely stirred ASP is designed with following data- **09**  
 i. Wastewater discharge - 4000 m<sup>3</sup>/d  
 ii. Standard BOD of influent - 300 mg/L  
 iii. Effluent BOD - 35 mg/L  
 iv. MLSS - 2500 mg/L  
 v. Sludge age - 10 days  
 vi. Y - 0.65  
 vii. K<sub>d</sub> - 0.05  
 Find:  
 a) Reactor volume  
 b) F/M Ratio  
 c) Oxygen requirement

**Q.5 Write short notes on following (any three):**

- a) Septic tank  
 b) Grit chamber  
 c) Disposal of sludge  
 d) Anaerobic pond

**09**

**Section - II**

- Q.6** a) Discuss the procedure involved in 'self-purification' of stream. **05**  
b) A stream, saturated with DO has flow of  $1.2 \text{ m}^3/\text{s}$ , BOD of  $4 \text{ mg/L}$  and rate constant of 0.3 per day. It receives an effluent discharge of  $0.25 \text{ m}^3/\text{s}$ . Having BOD  $20 \text{ mg/L}$ , DO  $5 \text{ mg/L}$  and rate constant 0.13 per day. The average velocity of flow of the stream is  $0.15 \text{ m/s}$ . Calculate the DO deficit at point 20 km & 40 km downstream. Assume that the temperature is  $20^\circ\text{C}$  throughout and BOD is measured at 5 days. Take saturation DO at  $20^\circ\text{C}$  as  $9.17 \text{ mg/L}$ . **05**
- Q.7** a) With the help of diagram explain constructed wetlands. **05**  
b) List different composting methods and explain 'Bangalore method' of composting. **04**
- Q.8** a) Explain functional outlines for solid waste disposal. **05**  
b) Illustrate the classification of solid wastes based on various types. **04**
- Q.9** Write short notes on following (any three): **09**  
a) ESP  
b) Ozone Depletion  
c) Decentralized treatment systems  
d) Cyclone Precipitator

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Highway & Tunnel Engineering**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The stopping sight distance depends upon \_\_\_\_\_.
  - a) total reaction time
  - b) speed of vehicle
  - c) efficiency of brakes
  - d) all of the above
- 2) On a single lane road with two-way traffic, the minimum stopping sight distance is equal to \_\_\_\_\_.
  - a) Stopping distance
  - b) two times the stopping distance
  - c) half the stopping distance
  - d) three times the stopping distance
- 3) Select the strength parameter of concrete used in design of plain jointed cement concrete pavements from the following choices:
  - a) Tensile strength
  - b) Compressive strength
  - c) Flexural strength
  - d) Shear strength.
- 4) Maximum number of vehicles can be parked with \_\_\_\_\_.
  - a) Parallel parking
  - b) 30° angle parking
  - c) 45° angle parking
  - d) 90° angle parking
- 5) The standard plate size in a plate bearing test for finding modulus of subgrade Reaction (k) value is \_\_\_\_\_.
  - a) 100 cm diameter
  - b) 50 cm diameter
  - c) 75 cm diameter
  - d) 25 cm diameter
- 6) The function of an expansion joint in rigid pavements is to \_\_\_\_\_.
  - a) Relieve warping stresses
  - b) Relieve shrinkage stresses
  - c) Resist stresses due to expansion
  - d) Allow free expansion
- 7) in highway construction, rolling starts from \_\_\_\_\_.
  - a) Sides and proceed to center
  - b) Center and proceed to sides
  - c) One side and proceed to other side
  - d) Any of the above



Seat No.	
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Set	P
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Tuesday, 07-02-2023

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) In Section - I, Q. No. 2 is compulsory and solve any TWO questions from remaining questions (Q. No. 3, 4 & 5).  
 2) In Section - II, Q. No. 6 is compulsory and solve any TWO questions from remaining questions (Q. No. 7, 8 & 9).  
 3) Figure on right indicates full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

**Q.2 Solve the following questions. 08**

The radius of a horizontal circular curve is 150 m. The design speed is 60 kmph and the design coefficient of lateral friction is 0.15.

- Calculate the super elevation required if full lateral friction is assumed to develop.
- Calculate the coefficient of friction needed if no super elevation is provided.
- Calculate the equilibrium super elevation if the pressure on inner and outer wheels should be equal.

**Q.3 Solve any two questions 10**

- Write a note on Third 20 Year Road Plan.
- Mention the different cross-sectional elements of highway and explain any one in detail.
- State different types of pavements and discuss their suitability.

**Q.4 Solve any two questions 10**

- Explain various characteristics of road transport in comparison with the other systems.
- Explain the factors controlling geometric design of roads
- Write a short note highway materials: Bitumen

**Q.5 Solve 10**

Explain different types of road surveys that are carried out before designing alignment.

**Section – II**

**Q.6 Solve any two questions 08**

- Differentiate between flexible & rigid pavement
- Find equivalent radius of resisting section of 20cm slab if contact area is  $707\text{cm}^2$
- Write a short on Softening point test on bitumen.

- Q.7 Solve any two questions** **10**
- a) Write a note on surface drainage system for highway.
  - b) Mention the specifications of materials and construction steps for Water Bound Macadam (WBM) road.
  - c) Write a short note on Pavement failures with its types.
- Q.8 Solve any two questions** **10**
- a) Explain highway user benefits.
  - b) Write a short note on highway cost & vehicular operation cost.
  - c) What is economic analysis & give the methods of it.
- Q.9 Solve** **10**
- With neat sketches explain different shapes of tunnel & its suitability.

<b>Seat No.</b>	
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<b>Set Q</b>
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Highway & Tunnel Engineering**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
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  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Los Angeles testing machine is used to conduct \_\_\_\_\_.
  - a) Abrasion test
  - b) Impact test
  - c) Attrition test
  - d) Crushing strength test
- 2) When the bituminous surfacing is done on already existing black top road or over existing cement concrete road, the type of treatment given is \_\_\_\_\_.
  - a) Seal coat
  - b) Tack coat
  - c) Prime coat
  - d) Spray of emulsion
- 3) The critical combination of stresses for corner region in cement concrete roads is \_\_\_\_\_.
  - a) Load stress + warping stress frictional stress
  - b) Load stress + warping stress + frictional stress
  - c) Load stress + warping stress
  - d) Load stress + frictional stress
- 4) Tyre pressure influences the
  - a) Total depth of pavement
  - b) Quality of surface course
  - c) Both the above
  - d) None of the above
- 5) The most suitable equipment for compacting clayey soils is a
  - a) Smooth wheeled roller
  - b) Pneumatic tyred roller
  - c) Sheep foot roller
  - d) Vibrator
- 6) Flexible pavement distribute the wheel load \_\_\_\_\_.
  - a) Directly to sub-grade
  - b) Through structural action
  - c) Through a set of layers to the sub-grade
  - d) None of the above

- 7) In full face method of constructing tunnel, the first operation relates \_\_\_\_\_.  
a) Removal of bottom portion  
b) Excavation of one drift in the center  
c) Removal of top portion  
d) Excavation being done along the perimeter
- 8) The stopping sight distance depends upon \_\_\_\_\_.  
a) total reaction time  
b) speed of vehicle  
c) efficiency of brakes  
d) all of the above
- 9) On a single lane road with two-way traffic, the minimum stopping sight distance is equal to \_\_\_\_\_.  
a) Stopping distance  
b) two times the stopping distance  
c) half the stopping distance  
d) three times the stopping distance
- 10) Select the strength parameter of concrete used in design of plain jointed cement concrete pavements from the following choices:  
a) Tensile strength  
b) Compressive strength  
c) Flexural strength  
d) Shear strength.
- 11) Maximum number of vehicles can be parked with \_\_\_\_\_.  
a) Parallel parking  
b) 30° angle parking  
c) 45° angle parking  
d) 90° angle parking
- 12) The standard plate size in a plate bearing test for finding modulus of subgrade Reaction (k) value is \_\_\_\_\_.  
a) 100 cm diameter  
b) 50 cm diameter  
c) 75 cm diameter  
d) 25 cm diameter
- 13) The function of an expansion joint in rigid pavements is to \_\_\_\_\_.  
a) Relieve warping stresses  
b) Relieve shrinkage stresses  
c) Resist stresses due to expansion  
d) Allow free expansion
- 14) in highway construction, rolling starts from \_\_\_\_\_.  
a) Sides and proceed to center  
b) Center and proceed to sides  
c) One side and proceed to other side  
d) Any of the above



Seat No.	
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Set Q
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Tuesday, 07-02-2023

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) In Section - I, Q. No. 2 is compulsory and solve any TWO questions from remaining questions (Q. No. 3, 4 & 5).  
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**Section – I**

**Q.2 Solve the following questions. 08**

The radius of a horizontal circular curve is 150 m. The design speed is 60 kmph and the design coefficient of lateral friction is 0.15.

- Calculate the super elevation required if full lateral friction is assumed to develop.
- Calculate the coefficient of friction needed if no super elevation is provided.
- Calculate the equilibrium super elevation if the pressure on inner and outer wheels should be equal.

**Q.3 Solve any two questions 10**

- Write a note on Third 20 Year Road Plan.
- Mention the different cross-sectional elements of highway and explain any one in detail.
- State different types of pavements and discuss their suitability.

**Q.4 Solve any two questions 10**

- Explain various characteristics of road transport in comparison with the other systems.
- Explain the factors controlling geometric design of roads
- Write a short note highway materials: Bitumen

**Q.5 Solve 10**

Explain different types of road surveys that are carried out before designing alignment.

**Section – II**

**Q.6 Solve any two questions 08**

- Differentiate between flexible & rigid pavement
- Find equivalent radius of resisting section of 20cm slab if contact area is  $707\text{cm}^2$
- Write a short on Softening point test on bitumen.

- Q.7 Solve any two questions** **10**
- a) Write a note on surface drainage system for highway.
  - b) Mention the specifications of materials and construction steps for Water Bound Macadam (WBM) road.
  - c) Write a short note on Pavement failures with its types.
- Q.8 Solve any two questions** **10**
- a) Explain highway user benefits.
  - b) Write a short note on highway cost & vehicular operation cost.
  - c) What is economic analysis & give the methods of it.
- Q.9 Solve** **10**
- With neat sketches explain different shapes of tunnel & its suitability.

<b>Seat No.</b>	
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Highway & Tunnel Engineering**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Tyre pressure influences the
  - a) Total depth of pavement
  - b) Quality of surface course
  - c) Both the above
  - d) None of the above
- 2) The most suitable equipment for compacting clayey soils is a
  - a) Smooth wheeled roller
  - b) Pneumatic tyred roller
  - c) Sheep foot roller
  - d) Vibrator
- 3) Flexible pavement distribute the wheel load \_\_\_\_\_.
  - a) Directly to sub-grade
  - b) Through structural action
  - c) Through a set of layers to the sub-grade
  - d) None of the above
- 4) In full face method of constructing tunnel, the first operation relates \_\_\_\_\_.
  - a) Removal of bottom portion
  - b) Excavation of one drift in the center
  - c) Removal of top portion
  - d) Excavation being done along the perimeter
- 5) The stopping sight distance depends upon \_\_\_\_\_.
  - a) total reaction time
  - b) speed of vehicle
  - c) efficiency of brakes
  - d) all of the above
- 6) On a single lane road with two-way traffic, the minimum stopping sight distance is equal to \_\_\_\_\_.
  - a) Stopping distance
  - b) two times the stopping distance
  - c) half the stopping distance
  - d) three times the stopping distance

- 7) Select the strength parameter of concrete used in design of plain jointed cement concrete pavements from the following choices:
- a) Tensile strength
  - b) Compressive strength
  - c) Flexural strength
  - d) Shear strength.
- 8) Maximum number of vehicles can be parked with \_\_\_\_\_.  
a) Parallel parking                      b) 30° angle parking  
c) 45° angle parking                      d) 90° angle parking
- 9) The standard plate size in a plate bearing test for finding modulus of subgrade Reaction (k) value is \_\_\_\_\_.  
a) 100 cm diameter                      b) 50 cm diameter  
c) 75 cm diameter                      d) 25 cm diameter
- 10) The function of an expansion joint in rigid pavements is to \_\_\_\_\_.  
a) Relieve warping stresses  
b) Relieve shrinkage stresses  
c) Resist stresses due to expansion  
d) Allow free expansion
- 11) in highway construction, rolling starts from \_\_\_\_\_.  
a) Sides and proceed to center  
b) Center and proceed to sides  
c) One side and proceed to other side  
d) Any of the above
- 12) Los Angeles testing machine is used to conduct \_\_\_\_\_.  
a) Abrasion test                      b) Impact test  
c) Attrition test                      d) Crushing strength test
- 13) When the bituminous surfacing is done on already existing black top road or over existing cement concrete road, the type of treatment given is \_\_\_\_\_.  
a) Seal coat                      b) Tack coat  
c) Prime coat                      d) Spray of emulsion
- 14) The critical combination of stresses for corner region in cement concrete roads is \_\_\_\_\_.  
a) Load stress + warping stress frictional stress  
b) Load stress + warping stress + frictional stress  
c) Load stress + warping stress  
d) Load stress + frictional stress

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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Tuesday, 07-02-2023

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) In Section - I, Q. No. 2 is compulsory and solve any TWO questions from remaining questions (Q. No. 3, 4 & 5).  
 2) In Section - II, Q. No. 6 is compulsory and solve any TWO questions from remaining questions (Q. No. 7, 8 & 9).  
 3) Figure on right indicates full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

**Q.2 Solve the following questions. 08**

The radius of a horizontal circular curve is 150 m. The design speed is 60 kmph and the design coefficient of lateral friction is 0.15.

- Calculate the super elevation required if full lateral friction is assumed to develop.
- Calculate the coefficient of friction needed if no super elevation is provided.
- Calculate the equilibrium super elevation if the pressure on inner and outer wheels should be equal.

**Q.3 Solve any two questions 10**

- Write a note on Third 20 Year Road Plan.
- Mention the different cross-sectional elements of highway and explain any one in detail.
- State different types of pavements and discuss their suitability.

**Q.4 Solve any two questions 10**

- Explain various characteristics of road transport in comparison with the other systems.
- Explain the factors controlling geometric design of roads
- Write a short note highway materials: Bitumen

**Q.5 Solve 10**

Explain different types of road surveys that are carried out before designing alignment.

**Section – II**

**Q.6 Solve any two questions 08**

- Differentiate between flexible & rigid pavement
- Find equivalent radius of resisting section of 20cm slab if contact area is  $707\text{cm}^2$
- Write a short on Softening point test on bitumen.

- Q.7 Solve any two questions** **10**
- a) Write a note on surface drainage system for highway.
  - b) Mention the specifications of materials and construction steps for Water Bound Macadam (WBM) road.
  - c) Write a short note on Pavement failures with its types.
- Q.8 Solve any two questions** **10**
- a) Explain highway user benefits.
  - b) Write a short note on highway cost & vehicular operation cost.
  - c) What is economic analysis & give the methods of it.
- Q.9 Solve** **10**
- With neat sketches explain different shapes of tunnel & its suitability.

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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicate full marks.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The function of an expansion joint in rigid pavements is to \_\_\_\_\_.
  - a) Relieve warping stresses
  - b) Relieve shrinkage stresses
  - c) Resist stresses due to expansion
  - d) Allow free expansion
- 2) in highway construction, rolling starts from \_\_\_\_\_.
  - a) Sides and proceed to center
  - b) Center and proceed to sides
  - c) One side and proceed to other side
  - d) Any of the above
- 3) Los Angeles testing machine is used to conduct \_\_\_\_\_.
  - a) Abrasion test
  - b) Impact test
  - c) Attrition test
  - d) Crushing strength test
- 4) When the bituminous surfacing is done on already existing black top road or over existing cement concrete road, the type of treatment given is \_\_\_\_\_.
  - a) Seal coat
  - b) Tack coat
  - c) Prime coat
  - d) Spray of emulsion
- 5) The critical combination of stresses for corner region in cement concrete roads is \_\_\_\_\_.
  - a) Load stress + warping stress
  - b) Load stress + warping stress + frictional stress
  - c) Load stress + warping stress
  - d) Load stress + frictional stress
- 6) Tyre pressure influences the
  - a) Total depth of pavement
  - b) Quality of surface course
  - c) Both the above
  - d) None of the above

- 7) The most suitable equipment for compacting clayey soils is a
- Smooth wheeled roller
  - Pneumatic tyred roller
  - Sheep foot roller
  - Vibrator
- 8) Flexible pavement distribute the wheel load \_\_\_\_\_.  
a) Directly to sub-grade  
b) Through structural action  
c) Through a set of layers to the sub-grade  
d) None of the above
- 9) In full face method of constructing tunnel, the first operation relates \_\_\_\_\_.  
a) Removal of bottom portion  
b) Excavation of one drift in the center  
c) Removal of top portion  
d) Excavation being done along the perimeter
- 10) The stopping sight distance depends upon \_\_\_\_\_.  
a) total reaction time  
b) speed of vehicle  
c) efficiency of brakes  
d) all of the above
- 11) On a single lane road with two-way traffic, the minimum stopping sight distance is equal to \_\_\_\_\_.  
a) Stopping distance  
b) two times the stopping distance  
c) half the stopping distance  
d) three times the stopping distance
- 12) Select the strength parameter of concrete used in design of plain jointed cement concrete pavements from the following choices:  
a) Tensile strength  
b) Compressive strength  
c) Flexural strength  
d) Shear strength.
- 13) Maximum number of vehicles can be parked with \_\_\_\_\_.  
a) Parallel parking  
b) 30° angle parking  
c) 45° angle parking  
d) 90° angle parking
- 14) The standard plate size in a plate bearing test for finding modulus of subgrade Reaction (k) value is \_\_\_\_\_.  
a) 100 cm diameter  
b) 50 cm diameter  
c) 75 cm diameter  
d) 25 cm diameter



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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Highway & Tunnel Engineering**

Day & Date: Tuesday, 07-02-2023

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) In Section - I, Q. No. 2 is compulsory and solve any TWO questions from remaining questions (Q. No. 3, 4 & 5).  
 2) In Section - II, Q. No. 6 is compulsory and solve any TWO questions from remaining questions (Q. No. 7, 8 & 9).  
 3) Figure on right indicates full marks.  
 4) Assume suitable data wherever needed & mention it clearly.

**Section – I**

**Q.2 Solve the following questions.** **08**

The radius of a horizontal circular curve is 150 m. The design speed is 60 kmph and the design coefficient of lateral friction is 0.15.

- Calculate the super elevation required if full lateral friction is assumed to develop.
- Calculate the coefficient of friction needed if no super elevation is provided.
- Calculate the equilibrium super elevation if the pressure on inner and outer wheels should be equal.

**Q.3 Solve any two questions** **10**

- Write a note on Third 20 Year Road Plan.
- Mention the different cross-sectional elements of highway and explain any one in detail.
- State different types of pavements and discuss their suitability.

**Q.4 Solve any two questions** **10**

- Explain various characteristics of road transport in comparison with the other systems.
- Explain the factors controlling geometric design of roads
- Write a short note highway materials: Bitumen

**Q.5 Solve** **10**

Explain different types of road surveys that are carried out before designing alignment.

**Section – II**

**Q.6 Solve any two questions** **08**

- Differentiate between flexible & rigid pavement
- Find equivalent radius of resisting section of 20cm slab if contact area is  $707\text{cm}^2$
- Write a short on Softening point test on bitumen.

- Q.7 Solve any two questions** **10**
- a) Write a note on surface drainage system for highway.
  - b) Mention the specifications of materials and construction steps for Water Bound Macadam (WBM) road.
  - c) Write a short note on Pavement failures with its types.
- Q.8 Solve any two questions** **10**
- a) Explain highway user benefits.
  - b) Write a short note on highway cost & vehicular operation cost.
  - c) What is economic analysis & give the methods of it.
- Q.9 Solve** **10**
- With neat sketches explain different shapes of tunnel & its suitability.

Seat No.	
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Set P
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**T.Y (B .Tech) (Sem- I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to right indicates full marks.  
4) Assume suitable data if necessary and state it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If the demand line drawn from a ridge in a flow mass curve does not intersect the curve again, it indicates that \_\_\_\_\_.  
 a) equal to the rate of rainfall  
 b) equal to the infiltration capacity  
 c) more than the infiltration capacity  
 d) has no relation either with the rainfall intensity or the infiltration capacity
- 2) Lysmeter is used to measure \_\_\_\_\_.  
 a) evaporation  
 b) evapotranspiration  
 c) transpiration  
 d) infiltration
- 3) The length of all streams per unit area of a watershed, is called: \_\_\_\_\_.  
 a) stream density  
 b) drainage density  
 c) drainage coefficient  
 d) distribution coefficient
- 4) Which index represents the average rate of infiltration only for that rainfall which contributes to runoff \_\_\_\_\_.  
 a)  $\phi$   
 b) W  
 c) both a and b  
 d) None of these
- 5) Stream flow may be measured in: \_\_\_\_\_.  
 a)  $m^3/sec$   
 b) m depth/sec  
 c) both (a) and (b)  
 d) Neither (a) or (b)
- 6) The Rational formula is restricted to the catchments of size less than: \_\_\_\_\_.  
 a) 500 ha  
 b) 5000 ha  
 c) 50000 ha  
 d) 5,00,000 ha
- 7) Which of the following formations does not contain any groundwater?  
 a) Aquifer  
 b) Aquifuge  
 c) Aquitard  
 d) Aquiclude

- 8) In the case of water table well, the piezometric surface \_\_\_\_\_.  
a) is above the ground level  
b) is below the Water level in the well  
c) Coincides with the water level in the well  
d) is between the water level in the well and ground level
- 9) Peninsular Component has total number of river links \_\_\_\_\_.  
a) 13 links  
b) 14 links  
c) 15 links  
d) 16 links
- 10) In portable sprinkler system \_\_\_\_\_ components are portable.  
a) main pipeline  
b) sub main pipeline  
c) sprinklers  
d) all of these
- 11) The duty of irrigation water for a given crop is maximum \_\_\_\_\_.  
a) on the field  
b) at the head of the main canal  
c) at the head of the water-course  
d) None of them
- 12) The Gross Irrigation Requirement (GIR) of water is equal to: \_\_\_\_\_.  
a)  $NIR + \eta_a$   
b)  $NIR + \eta_a * \eta_c$   
c)  $NIR / \eta_a * \eta_c$   
d) None of above  
where,  $\eta_a$  = water application efficiency  $\eta_c$  = water conveyance efficiency.
- 13) The drawback associated with Assessment of canal water by area basis \_\_\_\_\_.  
a) quantity of water used farmers is less  
b) Farmers near the head utilizes more water  
c) Farmers use to irrigate same area number of items  
d) Both a and b
- 14) Afforestation helps in \_\_\_\_\_.  
a) soil conservation  
b) water conservation  
c) Both of a and b  
d) None of these

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**T.Y (B .Tech) (Sem- I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 and Q. No. 6 are compulsory.  
 2) Attempt any two questions from the remaining questions of each section.  
 3) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2** a) Explain with sketch Thiessen's method for calculating average depth of Precipitation over an area. Discuss the relative merits of this method over other methods of computation. **05**
- b) The following data were collected during stream gauging operation in a river Compute the discharge. **05**

Distance from left water edge (m)	0	1.5	3.0	4.5	6.0	7.5	9.0
Depth (m)	0	1.3	2.5	1.7	1.0	0.4	0.0
Velocity at 0.2 d (m/s)	0	0.6	0.9	0.7	0.6	0.4	0.0
Velocity at 0.8 d (m/s)	0	0.4	0.6	0.5	0.4	0.3	0.0

- Q.3** a) What is flood and discuss various factors affecting flood? **04**
- b) The rainfall rates for successive 30 minutes interval up to 4 hrs are given in the table as below. If the surface runoff is 3.6 cm. determine the  $\phi$  and W index. **05**

Time (min)	0	30	60	90	120	150	180	210	240
Rainfall intensity (cm/hr)	0	1.3	2.8	4.2	3.9	2.8	2.2	1.8	0.9

- Q.4** a) What do you understand by recuperation test? Derive the expression used in this test? **04**
- b) Two storms each of 6-h duration having rainfall excess values of 3 and 2 cm respectively occur successively. The 2 cm ER follows the 3 cm rain. The 6-h UH for the catchment having following observations. Calculate the resulting DRH. **05**

Duration (h)	0	3	6	9	12	15	18	21	24
Ordinate of runoff hydrograph (m <sup>3</sup> /s)	0	10	15	21	30	25	20	10	5

- Q.5 a)** What is mean by Hydrograph? Explain procedure of finding runoff from a given Hydrograph. **04**
- b)** In an artesian aquifer of 8 m thick, a 10 cm diameter well is pumped at a constant rate of 100 lpm. The steady state drawdown observed in two wells located at 10 m and 50 m distance from the centre of the well are 3 m and 0.05 m respectively. Compute the transmissivity and the hydraulic conductivity of the aquifer. **05**

### Section – II

- Q.6 a)** Write a detailed note on 'National Perspective Plan' of National Water Development Academy for Inter-basin transfer of water in India. **05**
- b)** Discuss the concept of 'Bandhara irrigation system' with its advantages and disadvantages. **05**
- Q.7 a)** Describe with a neat sketch, general layout of a lift irrigation scheme. Briefly explain the Jack Well. **03**
- b)** The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given below. Find the reservoir capacity if the canal losses are 25% and reservoir losses are 20%. **06**

Crop	Base period (days)	Duty at field (ha/cumec)	Area under the crop (Ha)
Wheat	120	1700	5000
Sugarcane	360	600	6000
Cotton	200	1500	2500
Rice	120	800	3500
Vegetables	120	900	2400

- Q.8 a)** Discuss the terms field capacity, wilting point and optimum water content. **03**
- b)** Write a short note on Application of Remote Sensing and GIS in watershed management. **06**
- Q.9 a)** Enlist the watershed erosion control measures which are effective in preventing and delaying sediment deposition in reservoirs. **03**
- b)** The field capacity of a certain soil is 15% & the moisture content of the soil before irrigation is 8%. Determine the depth up to which the soil profile will be wetted with an application of 60 mm of water. Take dry weight of soil as 15.3 kN/m<sup>3</sup>. **06**

<b>Seat No.</b>	
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# Hydrology and Water Resources Engineering

Max. Marks: 70

- Instructions:**
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  - 3) Figures to right indicates full marks.
  - 4) Assume suitable data if necessary and state it clearly.

## Marks: 14

14

- 1) In the case of water table well, the piezometric surface \_\_\_\_\_.
  - a) is above the ground level
  - b) is below the Water level in the well
  - c) Coincides with the water level in the well
  - d) is between the water level in the well and ground level
- 2) Peninsular Component has total number of river links \_\_\_\_\_.
  - a) 13 links
  - b) 14 links
  - c) 15 links
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- 3) In portable sprinkler system \_\_\_\_\_ components are portable.
  - a) main pipeline
  - b) sub main pipeline
  - c) sprinklers
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- 4) The duty of irrigation water for a given crop is maximum \_\_\_\_\_.
  - a) on the field
  - b) at the head of the main canal
  - c) at the head of the water-course
  - d) None of them
- 5) The Gross Irrigation Requirement (GIR) of water is equal to: \_\_\_\_\_.
  - a)  $NIR + \eta_a$
  - b)  $NIR + \eta_a * \eta_c$
  - c)  $NIR / \eta_a * \eta_c$
  - d) None of above

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- 6) The drawback associated with Assessment of canal water by area basis \_\_\_\_\_.
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  - b) Farmers near the head utilizes more water
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- 7) Afforestation helps in \_\_\_\_\_.
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- 9) Lysmeter is used to measure \_\_\_\_\_.  
a) evaporation  
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- 10) The length of all streams per unit area of a watershed, is called: \_\_\_\_\_.  
a) stream density  
b) drainage density  
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- 11) Which index represents the average rate of infiltration only for that rainfall which contributes to runoff \_\_\_\_\_.  
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- 12) Stream flow may be measured in: \_\_\_\_\_.  
a)  $\text{m}^3/\text{sec}$   
b) m depth/sec  
c) both (a) and (b)  
d) Neither (a) or (b)
- 13) The Rational formula is restricted to the catchments of size less than: \_\_\_\_\_.  
a) 500 ha  
b) 5000 ha  
c) 50000 ha  
d) 5,00,000 ha
- 14) Which of the following formations does not contain any groundwater?  
a) Aquifer  
b) Aquifuge  
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Set **Q**

**T.Y (B .Tech) (Sem- I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 and Q. No. 6 are compulsory.  
 2) Attempt any two questions from the remaining questions of each section.  
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**Section – I**

- Q.2 a)** Explain with sketch Thiessen's method for calculating average depth of Precipitation over an area. Discuss the relative merits of this method over other methods of computation. **05**
- b)** The following data were collected during stream gauging operation in a river Compute the discharge. **05**

<b>Distance from left water edge (m)</b>	0	1.5	3.0	4.5	6.0	7.5	9.0
<b>Depth (m)</b>	0	1.3	2.5	1.7	1.0	0.4	0.0
<b>Velocity at 0.2 d (m/s)</b>	0	0.6	0.9	0.7	0.6	0.4	0.0
<b>Velocity at 0.8 d (m/s)</b>	0	0.4	0.6	0.5	0.4	0.3	0.0

- Q.3 a)** What is flood and discuss various factors affecting flood? **04**
- b)** The rainfall rates for successive 30 minutes interval up to 4 hrs are given in the table as below. If the surface runoff is 3.6 cm. determine the  $\phi$  and W index. **05**

<b>Time (min)</b>	0	30	60	90	120	150	180	210	240
<b>Rainfall intensity (cm/hr)</b>	0	1.3	2.8	4.2	3.9	2.8	2.2	1.8	0.9

- Q.4 a)** What do you understand by recuperation test? Derive the expression used in this test? **04**
- b)** Two storms each of 6-h duration having rainfall excess values of 3 and 2 cm respectively occur successively. The 2 cm ER follows the 3 cm rain. The 6-h UH for the catchment having following observations. Calculate the resulting DRH. **05**

<b>Duration (h)</b>	0	3	6	9	12	15	18	21	24
<b>Ordinate of runoff hydrograph (m<sup>3</sup>/s)</b>	0	10	15	21	30	25	20	10	5

- Q.5 a)** What is mean by Hydrograph? Explain procedure of finding runoff from a given Hydrograph. **04**
- b)** In an artesian aquifer of 8 m thick, a 10 cm diameter well is pumped at a constant rate of 100 lpm. The steady state drawdown observed in two wells located at 10 m and 50 m distance from the centre of the well are 3 m and 0.05 m respectively. Compute the transmissivity and the hydraulic conductivity of the aquifer. **05**

### Section – II

- Q.6 a)** Write a detailed note on 'National Perspective Plan' of National Water Development Academy for Inter-basin transfer of water in India. **05**
- b)** Discuss the concept of 'Bandhara irrigation system' with its advantages and disadvantages. **05**
- Q.7 a)** Describe with a neat sketch, general layout of a lift irrigation scheme. Briefly explain the Jack Well. **03**
- b)** The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given below. Find the reservoir capacity if the canal losses are 25% and reservoir losses are 20%. **06**

Crop	Base period (days)	Duty at field (ha/cumec)	Area under the crop (Ha)
<b>Wheat</b>	120	1700	5000
<b>Sugarcane</b>	360	600	6000
<b>Cotton</b>	200	1500	2500
<b>Rice</b>	120	800	3500
<b>Vegetables</b>	120	900	2400

- Q.8 a)** Discuss the terms field capacity, wilting point and optimum water content. **03**
- b)** Write a short note on Application of Remote Sensing and GIS in watershed management. **06**
- Q.9 a)** Enlist the watershed erosion control measures which are effective in preventing and delaying sediment deposition in reservoirs. **03**
- b)** The field capacity of a certain soil is 15% & the moisture content of the soil before irrigation is 8%. Determine the depth up to which the soil profile will be wetted with an application of 60 mm of water. Take dry weight of soil as 15.3 kN/m<sup>3</sup>. **06**

Seat No.	
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Set R
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**T.Y (B .Tech) (Sem- I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to right indicates full marks.  
 4) Assume suitable data if necessary and state it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The duty of irrigation water for a given crop is maximum \_\_\_\_\_.  
 a) on the field  
 b) at the head of the main canal  
 c) at the head of the water-course  
 d) None of them
- 2) The Gross Irrigation Requirement (GIR) of water is equal to: \_\_\_\_\_.  
 a)  $NIR + \eta_a$   
 b)  $NIR + \eta_a * \eta_c$   
 c)  $NIR / \eta_a * \eta_c$   
 d) None of above  
 where,  $\eta_a$  = water application efficiency  $\eta_c$  = water conveyance efficiency.
- 3) The drawback associated with Assessment of canal water by area basis \_\_\_\_\_.  
 a) quantity of water used farmers is less  
 b) Farmers near the head utilizes more water  
 c) Farmers use to irrigate same area number of items  
 d) Both a and b
- 4) Afforestation helps in \_\_\_\_\_.  
 a) soil conservation  
 b) water conservation  
 c) Both of a and b  
 d) None of these
- 5) If the demand line drawn from a ridge in a flow mass curve does not intersect the curve again, it indicates that \_\_\_\_\_.  
 a) equal to the rate of rainfall  
 b) equal to the infiltration capacity  
 c) more than the infiltration capacity  
 d) has no relation either with the rainfall intensity or the infiltration capacity
- 6) Lysmeter is used to measure \_\_\_\_\_.  
 a) evaporation  
 b) evapotranspiration  
 c) transpiration  
 d) infiltration



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Set R
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**T.Y (B .Tech) (Sem- I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 and Q. No. 6 are compulsory.  
 2) Attempt any two questions from the remaining questions of each section.  
 3) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain with sketch Thiessen's method for calculating average depth of Precipitation over an area. Discuss the relative merits of this method over other methods of computation. **05**
- b)** The following data were collected during stream gauging operation in a river Compute the discharge. **05**

<b>Distance from left water edge (m)</b>	0	1.5	3.0	4.5	6.0	7.5	9.0
<b>Depth (m)</b>	0	1.3	2.5	1.7	1.0	0.4	0.0
<b>Velocity at 0.2 d (m/s)</b>	0	0.6	0.9	0.7	0.6	0.4	0.0
<b>Velocity at 0.8 d (m/s)</b>	0	0.4	0.6	0.5	0.4	0.3	0.0

- Q.3 a)** What is flood and discuss various factors affecting flood? **04**
- b)** The rainfall rates for successive 30 minutes interval up to 4 hrs are given in the table as below. If the surface runoff is 3.6 cm. determine the  $\phi$  and W index. **05**

<b>Time (min)</b>	0	30	60	90	120	150	180	210	240
<b>Rainfall intensity (cm/hr)</b>	0	1.3	2.8	4.2	3.9	2.8	2.2	1.8	0.9

- Q.4 a)** What do you understand by recuperation test? Derive the expression used in this test? **04**
- b)** Two storms each of 6-h duration having rainfall excess values of 3 and 2 cm respectively occur successively. The 2 cm ER follows the 3 cm rain. The 6-h UH for the catchment having following observations. Calculate the resulting DRH. **05**

<b>Duration (h)</b>	0	3	6	9	12	15	18	21	24
<b>Ordinate of runoff hydrograph (m<sup>3</sup>/s)</b>	0	10	15	21	30	25	20	10	5

- Q.5 a)** What is mean by Hydrograph? Explain procedure of finding runoff from a given Hydrograph. **04**
- b)** In an artesian aquifer of 8 m thick, a 10 cm diameter well is pumped at a constant rate of 100 lpm. The steady state drawdown observed in two wells located at 10 m and 50 m distance from the centre of the well are 3 m and 0.05 m respectively. Compute the transmissivity and the hydraulic conductivity of the aquifer. **05**

### Section – II

- Q.6 a)** Write a detailed note on 'National Perspective Plan' of National Water Development Academy for Inter-basin transfer of water in India. **05**
- b)** Discuss the concept of 'Bandhara irrigation system' with its advantages and disadvantages. **05**
- Q.7 a)** Describe with a neat sketch, general layout of a lift irrigation scheme. Briefly explain the Jack Well. **03**
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<b>Seat No.</b>	
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# Hydrology and Water Resources Engineering

Max. Marks: 70

- ### MCQ/Objective Type Questions

Marks: 14

## 14

- Page 13 of 16

- 8) The drawback associated with Assessment of canal water by area basis \_\_\_\_\_.  
a) quantity of water used farmers is less  
b) Farmers near the head utilizes more water  
c) Farmers use to irrigate same area number of items  
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- 9) Afforestation helps in \_\_\_\_\_.  
a) soil conservation                      b) water conservation  
c) Both of a and b                      d) None of these
- 10) If the demand line drawn from a ridge in a flow mass curve does not intersect the curve again, it indicates that \_\_\_\_\_.  
a) equal to the rate of rainfall  
b) equal to the infiltration capacity  
c) more than the infiltration capacity  
d) has no relation either with the rainfall intensity or the infiltration capacity
- 11) Lysmeter is used to measure \_\_\_\_\_.  
a) evaporation                      b) evapotranspiration  
c) transpiration                      d) infiltration
- 12) The length of all streams per unit area of a watershed, is called: \_\_\_\_\_.  
a) stream density                      b) drainage density  
c) drainage coefficient                      d) distribution coefficient
- 13) Which index represents the average rate of infiltration only for that rainfall which contributes to runoff \_\_\_\_\_.  
a)  $\phi$                       b)  $W$   
c) both a and b                      d) None of these
- 14) Stream flow may be measured in: \_\_\_\_\_.  
a)  $m^3/sec$                       b) m depth/sec  
c) both (a) and (b)                      d) Neither (a) or (b)



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**T.Y (B .Tech) (Sem- I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydrology and Water Resources Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 and Q. No. 6 are compulsory.  
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**Section – I**

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### Section – II

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
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  - c) Partly true
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- 9)** Which of these is an economic activity?
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- 10)** Market system means: \_\_\_\_\_.
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<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
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- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
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| a) Importance of money in economy  |               |
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Seat No.	
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Duration: 20 Minutes

Marks:10

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<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

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- |  |               |
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| a) Nature of Economics   |               |
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Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

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- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7)** Which one of the following is the objective of the RBI?  
a) To maintain term deposits of the households  
b) To ensure price stability  
c) To arrange loans for the businessmen  
d) None of the above
- 8)** Which one of the following cost can never become zero?  
a) Average cost  
b) Fixed cost  
c) Marginal cost  
d) Variable cost
- 9)** Microeconomic theory deals with \_\_\_\_\_  
a) Economic behavior of individual economic decision-making units  
b) Economy as whole  
c) Trade relations  
d) Economic growth of the society
- 10)** In a mixed economy which sector (s) is / are found \_\_\_\_\_  
a) Private only  
b) Public only  
c) None  
d) Both (a) public and (b) private

**SLR-HL-21**

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850

- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- |              |               |
|--------------|---------------|
| a) Copyright | b) Patents    |
| c) Contracts | d) Trademarks |



<b>Seat No.</b>	
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**Set****P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two)**

**20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four)**

**20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

<b>Seat No.</b>	
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**Set Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and  
Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two)****20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four)****20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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## Intellectual Property Rights for Technology Development and Management

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks:10

10

- 1) The first Patent Law was enacted in India in the year \_\_\_\_

  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 2) All of the following are examples of intellectual property protections except \_\_\_\_.

  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks
- 3) Which is not a type of intellectual property?

  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 4) In which article is intellectual property rights outlined?

  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 5) How long does intellectual property last? (after the death of the author)

  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 6) Which of the following can you copyright?

  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 7) Which of the following identifies as a trademark?

  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 8) What is the subject matter of a patent?

  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 9) What is copyright meant for?

  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and  
Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks



- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

**SLR-HL-22**

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement

<b>Seat No.</b>	
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**Set****P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**

**CIVIL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **R****T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**

**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 2) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 3) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 4) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 5) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 6) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 7) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**



Seat No.	
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Set **S****T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**

**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 2) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 3) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 5) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 6) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 8) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 9) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 10) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**CIVIL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) The word Stress is derived from Latin word ‘Stringere’ which means \_\_\_\_\_.  
a) Draw tight                                      b) Stimulus  
c) Force    d) Attitude
- 2) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
a) Medical    b) Psychological  
c) Behavioral                                        d) None of these
- 3) When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later                          b) Drink alcohol to relax  
c) Break it down into smaller task          d) Avoid the task
- 4) A good way to prevent stress is \_\_\_\_\_.  
a) Drinking beverages high in caffeine  
b) Sitting ideal doing nothing  
c) Overeating  
d) Taking time out for relaxation
- 5) \_\_\_\_\_ is referred as a stressful event.  
a) Birthday    b) Studying  
c) Spouse death                                    d) Vacation
- 6) Anxiety can cause the following moods \_\_\_\_\_.  
a) Irritable    b) Nervous  
c) Anxious    d) All of the above
- 7) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
a) Role stagnation                                b) Role Isolation  
c) Role erosion                                     d) Role ambiguity
- 8) Stress is \_\_\_\_\_ related to performance.  
a) Positively                                        b) Negatively  
c) Proportionately                                d) None of these
- 9) Which one is not considered as Environmental stressors?  
a) Weather    b) Traffic  
c) Financial problems                            d) Substandard housing

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |



Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_.
- a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

### MCQ/Objective Type Questions

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

10

- 1) Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture  
b) Value  
c) Society  
d) Moral
- 2) Virtues are \_\_\_\_\_.  
a) Moral  
b) Ethics  
c) Values  
d) Positive and preferred values
- 3) Honestly is a \_\_\_\_\_.  
a) Virtue  
b) Truthfulness  
c) Trustworthiness  
d) Communication
- 4) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.  
a) Nature  
b) Nurture  
c) World  
d) Universe
- 5) One of the basic desires of every human being is to be always \_\_\_\_\_.  
a) Happy  
b) Sad  
c) Laugh  
d) Earn money
- 6) Courage is the tendency to accept and face \_\_\_\_\_.  
a) Self-confidence  
b) Risks and difficult tasks in rational ways  
c) Physical courage  
d) Social courage
- 7) Commitment means \_\_\_\_\_.  
a) Alignment to goals  
b) Adherence to ethical principles  
c) Empathy  
d) All the above
- 8) The objectives of professional ethics in engineering are  
a) To understand the moral values that ought to guide the Engineering profession  
b) To resolve the moral issues in the profession, and  
c) To justify the moral judgment concerning the profession  
d) All the above

- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

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<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4 Write short notes on any four** **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks:10

10

- Page 10 of 12



- 9)** Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture  
b) Value  
c) Society  
d) Moral
- 10)** Virtues are \_\_\_\_\_.  
a) Moral  
b) Ethics  
c) Values  
d) Positive and preferred values

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

**Seat  
No.**

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<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T. Y. (B.Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**

**CIVIL ENGINEERING**  
**Foundation Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Section-I Q. No. 2 is compulsory. Solve any two from remaining.  
2) Section-II Q. No. 6 is compulsory. Solve any two from remaining.  
3) Assume additional data, required and state it clearly.  
4) Figure to right indicate full marks.

**Section – I**

- Q.2 Attempt any two** **10**
- Effect of water table on bearing capacity.
  - Explain the functions of geotextiles.
  - Explain wash boring with neat sketch.
  - IS code method of finding bearing capacity.
- Q.3** **05**
- Explain the objectives of the soil exploration.
  - A sampling tube has inner diameter 70 mm and that of a cutting edge is equal to 68mm. Their outer diameters are 72mm and 74mm respectively. Determine the inside clearance, outside clearance and area ratio of the sampler. This tube is pushed at bottom of a borehole to a distance of 550 mm and length of sample covered is 80mm. Find the recovery ratio. **04**
- Q.4** **04**
- Write the difference between general shear failure and local shear failure.
  - A square footing fails by general shear in a cohesionless soil under an ultimate load of 3000kN. The footing is placed at a depth of 3m below ground level. Take  $\phi = 35^\circ$ ,  $N_q = 41.4$ ,  $N_\gamma = 42.4$  and  $\gamma = 19 \text{ KN/m}^3$ . Determine to size of the footing if the water table is at a great depth. **05**
- Q.5** **04**
- What is Expansive soil? What precautions to be taken while designing foundation in expansive soil?
  - Explain the below ground improvement techniques. **05**
    - Sand drains
    - Grouting

**Section – II**

- Q.6 Attempt any two** **10**
- Negative skin friction
  - Undreamed piles
  - Mat or raft foundations
  - Fellenius construction to locate critical slip centre

- Q.7**   **a)**   What are different types of shallow foundations? Explain with the help of neat sketches. **04**
- b)**   A trapezoidal footing is to be produced to support two square columns of 30 cm and 50 cm sides respectively. Columns are 6 metres apart and the safe bearing capacity of the soil is 400 kN/m<sup>2</sup>. The bigger column carries 5000 kN and the smaller 3000 kN. Design a suitable size of the footing so that it does not extend beyond the faces of the columns. **05**
- Q.8**   **a)**   Classify piles according to their functions. **04**
- b)**   A pile is driven in a uniform clay of large depth. The clay has an unconfined compression strength of 80 kN/m<sup>2</sup>. The pile is 350mm diameter and 7 m long. Determine the safe frictional resistance of the pile, assuming a factor of safety of 3. Assume the adhesion factor  $\alpha = 0.7$ . **05**
- Q.9**   **a)**   Draw a neat labeled sketch of slope and enlist causes of failure of slope. **05**
- b)**   Calculate the factor of safety with respect to cohesion of clay, slope laid at 1 in 2 to a length of 11 m. If the angle of internal friction  $\phi = 10^\circ$ , Taylors stability number 0.064,  $C = 20 \text{ kN/m}^2$  and  $\gamma = 19 \text{ kN/m}^3$ . Determine the Critical height of the slope in this soil. **04**

<b>Seat No.</b>	
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<b>Set Q</b>
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**T. Y. (B.Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Foundation Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option. 14**

- 1) When the two column loads are unequal, with the outer column carrying heavier load and there is space limitation beyond the outer column, which of the following combined footing is adopted
  - a) Rectangular footing
  - b) Trapezoidal footing
  - c) Mat foundation
  - d) Strip footing
- 2) Location of critical slip circle for a given slope can be found by using method suggested by \_\_\_\_\_.
  - a) Taylor
  - b) Cassagrande
  - c) Fellenius
  - d) Bishop
- 3) Efficiency of pile group consisting of four piles by using Feld's rule is
  - a) 93.75
  - b) 81.25
  - c) 87.5
  - d) None
- 4) The bottom plug in well foundation is usually made up of \_\_\_\_\_.
  - a) Brick masonry
  - b) RCC
  - c) Cement concrete
  - d) None
- 5) Taylor's stability charts are based on the total stress using the \_\_\_\_\_.
  - a) Friction circle method
  - b) Method of slices
  - c)  $\phi = 0$  Analysis
  - d) None
- 6) For cantilever sheet pile supporting clayey soil having  $c=25$  KPa, pressure intensity at the top of wall is \_\_\_\_\_.
  - a) 0
  - b) -25 KPa
  - c) -50 Kpa
  - d) None
- 7) Anchored sheet pile wall embedded in cohesive soil, shape of the pressure distribution diagram below dredge level is
  - a) Parabolic
  - b) Triangular
  - c) Rectangular
  - d) None
- 8) If RQD of the sample is 47% then quality of sample is \_\_\_\_\_.
  - a) Poor
  - b) Good
  - c) Very Good
  - d) Fair

- 9) One of the purposes of soil exploration is \_\_\_\_\_.  
a) To understand the behavior of the structure  
b) To estimate the load coming on the soil  
c) To find the quantity and quality of water  
d) To determine basic properties of soil
- 10) In case of sandy soil, which settlement is predominant?  
a) Immediate settlement  
b) Consolidation settlement  
c) Secondary consolidation settlement  
d) None
- 11) The angle of shear resistance  $\phi > 36^\circ$  the type of failure in soil is \_\_\_\_\_.  
a) General shear failure                      b) Local shear failure  
c) Punching shear failure                      d) None
- 12) These type of soil deposit are often found near the mouths of rivers, along the perimeters of bays and beneath swamps or lagoons \_\_\_\_\_.  
a) Collapsible soil                                  b) Expansive soil  
c) Corrosive soil                                      d) Weak/Compressible soil
- 13) In case of plate load test seating load to be applied is \_\_\_\_\_.  
a) 5 KPa    b) 10 KPa  
c) 7 KPa    d) None
- 14) Mineral present in expansive soil is \_\_\_\_\_.  
a) Illite    b) Montmorillonite  
c) Kaolinite    d) None



Seat No.	
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Set Q
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**T. Y. (B.Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**

**CIVIL ENGINEERING  
Foundation Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Section-I Q. No. 2 is compulsory. Solve any two from remaining.  
2) Section-II Q. No. 6 is compulsory. Solve any two from remaining.  
3) Assume additional data, required and state it clearly.  
4) Figure to right indicate full marks.

**Section – I**

- Q.2 Attempt any two** **10**
- Effect of water table on bearing capacity.
  - Explain the functions of geotextiles.
  - Explain wash boring with neat sketch.
  - IS code method of finding bearing capacity.
- Q.3** **05**
- Explain the objectives of the soil exploration.
  - A sampling tube has inner diameter 70 mm and that of a cutting edge is equal to 68mm. Their outer diameters are 72mm and 74mm respectively. Determine the inside clearance, outside clearance and area ratio of the sampler. This tube is pushed at bottom of a borehole to a distance of 550 mm and length of sample covered is 80mm. Find the recovery ratio. **04**
- Q.4** **04**
- Write the difference between general shear failure and local shear failure.
  - A square footing fails by general shear in a cohesionless soil under an ultimate load of 3000kN. The footing is placed at a depth of 3m below ground level. Take  $\phi = 35^\circ$ ,  $N_q = 41.4$ ,  $N_\gamma = 42.4$  and  $\gamma = 19 \text{ KN/m}^3$ . Determine to size of the footing if the water table is at a great depth. **05**
- Q.5** **04**
- What is Expansive soil? What precautions to be taken while designing foundation in expansive soil?
  - Explain the below ground improvement techniques. **05**
    - Sand drains
    - Grouting

**Section – II**

- Q.6 Attempt any two** **10**
- Negative skin friction
  - Undreamed piles
  - Mat or raft foundations
  - Fellenius construction to locate critical slip centre

- Q.7**   **a)**   What are different types of shallow foundations? Explain with the help of neat sketches. **04**
- b)**   A trapezoidal footing is to be produced to support two square columns of 30 cm and 50 cm sides respectively. Columns are 6 metres apart and the safe bearing capacity of the soil is 400 kN/m<sup>2</sup>. The bigger column carries 5000 kN and the smaller 3000 kN. Design a suitable size of the footing so that it does not extend beyond the faces of the columns. **05**
- Q.8**   **a)**   Classify piles according to their functions. **04**
- b)**   A pile is driven in a uniform clay of large depth. The clay has an unconfined compression strength of 80 kN/m<sup>2</sup>. The pile is 350mm diameter and 7 m long. Determine the safe frictional resistance of the pile, assuming a factor of safety of 3. Assume the adhesion factor  $\alpha = 0.7$ . **05**
- Q.9**   **a)**   Draw a neat labeled sketch of slope and enlist causes of failure of slope. **05**
- b)**   Calculate the factor of safety with respect to cohesion of clay, slope laid at 1 in 2 to a length of 11 m. If the angle of internal friction  $\phi = 10^\circ$ , Taylors stability number 0.064,  $C = 20 \text{ kN/m}^2$  and  $\gamma = 19 \text{ kN/m}^3$ . Determine the Critical height of the slope in this soil. **04**

**Seat  
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Set	R
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Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- 1) The bottom plug in well foundation is usually made up of \_\_\_\_\_.
  - a) Brick masonry
  - b) RCC
  - c) Cement concrete
  - d) None
- 2) Taylor's stability charts are based on the total stress using the \_\_\_\_\_.
  - a) Friction circle method
  - b) Method of slices
  - c)  $\phi = 0$  Analysis
  - d) None
- 3) For cantilever sheet pile supporting clayey soil having  $c=25$  KPa, pressure intensity at the top of wall is \_\_\_\_\_.
  - a) 0
  - b) -25 KPa
  - c) -50 Kpa
  - d) None
- 4) Anchored sheet pile wall embedded in cohesive soil, shape of the pressure distribution diagram below dredge level is
  - a) Parabolic
  - b) Triangular
  - c) Rectangular
  - d) None
- 5) If RQD of the sample is 47% then quality of sample is \_\_\_\_\_.
  - a) Poor
  - b) Good
  - c) Very Good
  - d) Fair
- 6) One of the purposes of soil exploration is \_\_\_\_\_.
  - a) To understand the behavior of the structure
  - b) To estimate the load coming on the soil
  - c) To find the quantity and quality of water
  - d) To determine basic properties of soil
- 7) In case of sandy soil, which settlement is predominant?
  - a) Immediate settlement
  - b) Consolidation settlement
  - c) Secondary consolidation settlement
  - d) None
- 8) The angle of shear resistance  $\phi > 36^\circ$  the type of failure in soil is \_\_\_\_\_.
  - a) General shear failure
  - b) Local shear failure
  - c) Punching shear failure
  - d) None

- 9) These type of soil deposit are often found near the mouths of rivers, along the perimeters of bays and beneath swamps or lagoons \_\_\_\_
- a) Collapsible soil                      b) Expansive soil  
c) Corrosive soil                        d) Weak/Compressible soil
- 10) In case of plate load test seating load to be applied is \_\_\_\_.
- a) 5 KPa                                      b) 10 KPa  
c) 7 KPa                                      d) None
- 11) Mineral present in expansive soil is \_\_\_\_.
- a) Illite                                        b) Montmorillonite  
c) Kaolinite                                d) None
- 12) When the two column loads are unequal, with the outer column carrying heavier load and there is space limitation beyond the outer column, which of the following combined footing is adopted
- a) Rectangular footing                  b) Trapezoidal footing  
c) Mat foundation                        d) Strip footing
- 13) Location of critical slip circle for a given slope can be found by using method suggested by \_\_\_\_.
- a) Taylor                                      b) Cassagrande  
c) Fellenius                                  d) Bishop
- 14) Efficiency of pile group consisting of four piles by using Feld's rule is
- a) 93.75                                        b) 81.25  
c) 87.5                                         d) None

Seat No.	
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**T. Y. (B.Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**

**CIVIL ENGINEERING  
Foundation Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Section-I Q. No. 2 is compulsory. Solve any two from remaining.  
2) Section-II Q. No. 6 is compulsory. Solve any two from remaining.  
3) Assume additional data, required and state it clearly.  
4) Figure to right indicate full marks.

**Section – I**

- Q.2 Attempt any two** **10**
- Effect of water table on bearing capacity.
  - Explain the functions of geotextiles.
  - Explain wash boring with neat sketch.
  - IS code method of finding bearing capacity.
- Q.3** **05**
- Explain the objectives of the soil exploration.
  - A sampling tube has inner diameter 70 mm and that of a cutting edge is equal to 68mm. Their outer diameters are 72mm and 74mm respectively. Determine the inside clearance, outside clearance and area ratio of the sampler. This tube is pushed at bottom of a borehole to a distance of 550 mm and length of sample covered is 80mm. Find the recovery ratio. **04**
- Q.4** **04**
- Write the difference between general shear failure and local shear failure.
  - A square footing fails by general shear in a cohesionless soil under an ultimate load of 3000kN. The footing is placed at a depth of 3m below ground level. Take  $\phi = 35^\circ$ ,  $N_q = 41.4$ ,  $N_\gamma = 42.4$  and  $\gamma = 19 \text{ KN/m}^3$ . Determine to size of the footing if the water table is at a great depth. **05**
- Q.5** **04**
- What is Expansive soil? What precautions to be taken while designing foundation in expansive soil?
  - Explain the below ground improvement techniques. **05**
    - Sand drains
    - Grouting

**Section – II**

- Q.6 Attempt any two** **10**
- Negative skin friction
  - Undreamed piles
  - Mat or raft foundations
  - Fellenius construction to locate critical slip centre

- Q.7**   **a)**   What are different types of shallow foundations? Explain with the help of neat sketches. **04**
- b)**   A trapezoidal footing is to be produced to support two square columns of 30 cm and 50 cm sides respectively. Columns are 6 metres apart and the safe bearing capacity of the soil is 400 kN/m<sup>2</sup>. The bigger column carries 5000 kN and the smaller 3000 kN. Design a suitable size of the footing so that it does not extend beyond the faces of the columns. **05**
- Q.8**   **a)**   Classify piles according to their functions. **04**
- b)**   A pile is driven in a uniform clay of large depth. The clay has an unconfined compression strength of 80 kN/m<sup>2</sup>. The pile is 350mm diameter and 7 m long. Determine the safe frictional resistance of the pile, assuming a factor of safety of 3. Assume the adhesion factor  $\alpha = 0.7$ . **05**
- Q.9**   **a)**   Draw a neat labeled sketch of slope and enlist causes of failure of slope. **05**
- b)**   Calculate the factor of safety with respect to cohesion of clay, slope laid at 1 in 2 to a length of 11 m. If the angle of internal friction  $\phi = 10^\circ$ , Taylors stability number 0.064,  $C = 20 \text{ kN/m}^2$  and  $\gamma = 19 \text{ kN/m}^3$ . Determine the Critical height of the slope in this soil. **04**

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 13 of 16

- 9) Anchored sheet pile wall embedded in cohesive soil, shape of the pressure distribution diagram below dredge level is
- a) Parabolic
  - b) Triangular
  - c) Rectangular
  - d) None
- 10) If RQD of the sample is 47% then quality of sample is \_\_\_\_ .
- a) Poor
  - b) Good
  - c) Very Good
  - d) Fair
- 11) One of the purposes of soil exploration is \_\_\_\_.
- a) To understand the behavior of the structure
  - b) To estimate the load coming on the soil
  - c) To find the quantity and quality of water
  - d) To determine basic properties of soil
- 12) In case of sandy soil, which settlement is predominant?
- a) Immediate settlement
  - b) Consolidation settlement
  - c) Secondary consolidation settlement
  - d) None
- 13) The angle of shear resistance  $\phi > 36^\circ$  the type of failure in soil is \_\_\_\_.
- a) General shear failure
  - b) Local shear failure
  - c) Punching shear failure
  - d) None
- 14) These type of soil deposit are often found near the mouths of rivers, along the perimeters of bays and beneath swamps or lagoons \_\_\_\_
- a) Collapsible soil
  - b) Expansive soil
  - c) Corrosive soil
  - d) Weak/Compressible soil



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**T. Y. (B.Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**

**CIVIL ENGINEERING**  
**Foundation Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Section-I Q. No. 2 is compulsory. Solve any two from remaining.  
2) Section-II Q. No. 6 is compulsory. Solve any two from remaining.  
3) Assume additional data, required and state it clearly.  
4) Figure to right indicate full marks.

**Section – I**

- Q.2 Attempt any two** **10**
- Effect of water table on bearing capacity.
  - Explain the functions of geotextiles.
  - Explain wash boring with neat sketch.
  - IS code method of finding bearing capacity.
- Q.3** **05**
- Explain the objectives of the soil exploration.
  - A sampling tube has inner diameter 70 mm and that of a cutting edge is equal to 68mm. Their outer diameters are 72mm and 74mm respectively. Determine the inside clearance, outside clearance and area ratio of the sampler. This tube is pushed at bottom of a borehole to a distance of 550 mm and length of sample covered is 80mm. Find the recovery ratio. **04**
- Q.4** **04**
- Write the difference between general shear failure and local shear failure.
  - A square footing fails by general shear in a cohesionless soil under an ultimate load of 3000kN. The footing is placed at a depth of 3m below ground level. Take  $\phi = 35^\circ$ ,  $N_q = 41.4$ ,  $N_\gamma = 42.4$  and  $\gamma = 19 \text{ KN/m}^3$ . Determine to size of the footing if the water table is at a great depth. **05**
- Q.5** **04**
- What is Expansive soil? What precautions to be taken while designing foundation in expansive soil?
  - Explain the below ground improvement techniques. **05**
    - Sand drains
    - Grouting

**Section – II**

- Q.6 Attempt any two** **10**
- Negative skin friction
  - Undreamed piles
  - Mat or raft foundations
  - Fellenius construction to locate critical slip centre

- Q.7** a) What are different types of shallow foundations? Explain with the help of neat sketches. **04**
- b) A trapezoidal footing is to be produced to support two square columns of 30 cm and 50 cm sides respectively. Columns are 6 metres apart and the safe bearing capacity of the soil is 400 kN/m<sup>2</sup>. The bigger column carries 5000 kN and the smaller 3000 kN. Design a suitable size of the footing so that it does not extend beyond the faces of the columns. **05**
- Q.8** a) Classify piles according to their functions. **04**
- b) A pile is driven in a uniform clay of large depth. The clay has an unconfined compression strength of 80 kN/m<sup>2</sup>. The pile is 350mm diameter and 7 m long. Determine the safe frictional resistance of the pile, assuming a factor of safety of 3. Assume the adhesion factor  $\alpha = 0.7$ . **05**
- Q.9** a) Draw a neat labeled sketch of slope and enlist causes of failure of slope. **05**
- b) Calculate the factor of safety with respect to cohesion of clay, slope laid at 1 in 2 to a length of 11 m. If the angle of internal friction  $\phi = 10^\circ$ , Taylors stability number 0.064,  $C = 20$  kN/m<sup>2</sup> and  $\gamma = 19$  kN/m<sup>3</sup>. Determine the Critical height of the slope in this soil. **04**

Seat No.	
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Set	P
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Hydraulic Structures & Water Power Engg**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The 'surcharge storage' in a dam reservoir is the volume of water stored between \_\_\_\_\_.  
 a) minimum and maximum reservoir levels  
 b) minimum and normal reservoir levels  
 c) normal and maximum reservoir levels  
 d) none of the above
- 2) Trap efficiency of a storage reservoir indicates the: \_\_\_\_\_.  
 a) sediment volume trapped in the reservoir  
 b) sediment volume let out from the reservoir  
 c) sediment volume trapped in relation to the sediment volume entering the reservoir  
 d) None of these
- 3) The horizontal component of the earthquake wave, producing instability in a dam, is the one, which acts: \_\_\_\_\_.  
 a) towards the reservoir  
 b) towards the dam  
 c) both (a) and (b)  
 d) none of the above
- 4) The most economical central angle of the arch rings in an arch dam, is: \_\_\_\_\_.  
 a) 123°-34'  
 b) 133°-34'  
 c) 143°-34'  
 d) 153°-34'
- 5) The most preferred soil for the central impervious core of a zoned embankment type of an earthen dam, is: \_\_\_\_\_.  
 a) highly impervious clay  
 b) highly pervious gravel  
 c) coarse sand  
 d) clay mixed with fine sand
- 6) When the water level standing against an earthen embankment, suddenly falls down, then there is an imminent risk of sliding failure, to the: \_\_\_\_\_.  
 a) upstream slope  
 b) downstream slope  
 c) both (a) and (b)  
 d) none of these

- 7) The 'safety valve' of a dam is its: \_\_\_\_\_.  
a) drainage gallery                      b) inspection gallery  
c) spillway                                  d) outlet sluices
- 8) The spillway involving weir type spills, giving increased discharge with the increase in reservoir level, are: \_\_\_\_\_.  
a) ogee spillways                      b) chute spillways  
c) side channel spillways              d) all of these
- 9) The critical exit gradient suggested in Khosla's theory of design of weirs and barrages, is \_\_\_\_\_.  
a) less for more porous soils              b) more for more porous soils  
c) equal for all kinds of soils              d) none of them
- 10) The value of Khosla's safe exit gradient for usually met alluvial river soils of our country, is: \_\_\_\_\_.  
a) 0    b) 1  
c)  $\infty$     d)  $1/4$  to  $1/6$
- 11) The canal, which may frequently encounter cross-drainage works, will be a: \_\_\_\_\_.  
a) watershed canal                      b) contour canal  
c) side slope canal                      d) none of them
- 12) Tortuosity of a meandering river is the ratio of \_\_\_\_\_.  
a) Meander belt to meander length  
b) Meander length to meander belt  
c) Curved length along the channel to the direct axial length of the river reach  
d) Direct axial length of the river reach to curved length along the channel
- 13) Aggrading rivers are \_\_\_\_\_.  
a) silting rivers                              b) scouring rivers  
c) rivers in regime                          d) meandering rivers
- 14) If the peak load for a power plant equals the plant capacity, then the ratio of capacity factor to load factor will be: \_\_\_\_\_.  
a) 1    b) 0  
c)  $<1$     d)  $>1$

Seat No.	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydraulic Structures & Water Power Engg**

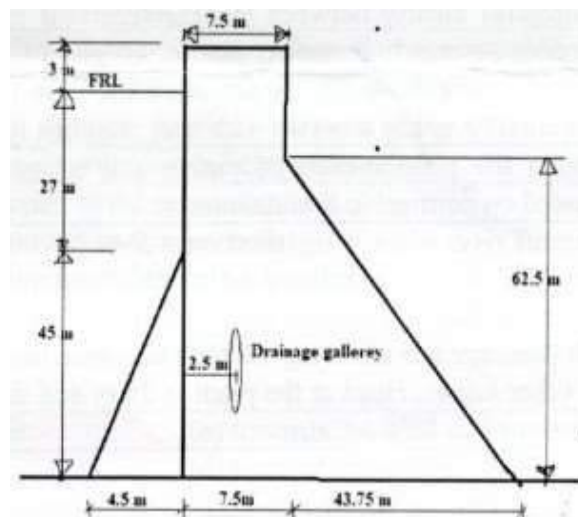
Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) In Section – I, Q. No. 3 is compulsory. Attempt any two questions from the remaining questions.  
 4) In Section – II, Q. No. 9 is compulsory. Attempt any two questions from the remaining questions.

**Section – I**

- Q.2** a) What are the different methods of construction of earthen dam? Explain any one in details. **04**  
 b) What is mean by energy dissipation? Why it is required? Explain any one method of energy dissipation at downstream side of spillway. **05**
- Q.3** Section of Gravity dam along with drainage gallery is shown below. Analyse the stability of it when reservoir is full. Also find principal stress and shear stress at the toe and heel of dam. No tail water condition. Assume specific weight of concrete as  $23.544 \text{ kN./m}^3$ , coefficient of friction 0.7, and shear strength of concrete as  $1373.4 \text{ kN./m}^2$  **10**



- Q.4** a) What are the methods adopted to control seepage through the foundation of earthen dam? Explain any one with neat sketch. **04**  
 b) Explain different investigations those are carried out for planning of reservoir at a site. **05**
- Q.5** a) Enlist and explain different types of reservoirs. **04**  
 b) What is role of spillway gates? Explain Tainter and drum gate with neat sketches. **05**

**Section – II**

- Q.6**   **a)**   Explain the term weir and enlist the criterions of site selection for K.T Weir.   **04**  
         **b)**   What is mean by canal lining? What are its different types? Explain any one with its advantages and disadvantages.   **05**
- Q.7**   **a)**   What is role of cross drainage works in the canal alignment? Explain super passage with neat sketch.   **04**  
         **b)**   What is mean by water logging? Explain different techniques to overcome it with neat sketches.   **05**
- Q.8**   **a)**   Distinguish clearly between storage reservoir Hydropower plants and pumped-storage hydropower plants.   **04**  
         **b)**   What are different methods those are used for river training and bank protection? Explain any two with neat sketches   **05**
- Q.9**   **a)**   Explain the phenomenon of piping and under cutting for structures founded on permeable foundations.   **04**  
         **b)**   A runoff river plant is installed on a river having minimum flow of 12 cumec. If the plant is used as a peak load plant operating only for 6 hours per day. Determine firm capacity of plant without pondage and with pondage but allowing 10% of the water to be lost in evaporation and other losses. Head at the plant is 15 m and the plant efficiency may be assumed as 80%.   **06**

<b>Seat No.</b>	
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# Hydraulic Structures & Water Power Engg

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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Marks: 14

14

- 1) The spillway involving weir type spills, giving increased discharge with the increase in reservoir level, are: \_\_\_\_\_.  
a) ogee spillways                      b) chute spillways  
c) side channel spillways          d) all of these
- 2) The critical exit gradient suggested in Khosla's theory of design of weirs and barrages, is \_\_\_\_\_.  
a) less for more porous soils        b) more for more porous soils  
c) equal for all kinds of soils        d) none of them
- 3) The value of Khosla's safe exit gradient for usually met alluvial river soils of our country, is: \_\_\_\_\_.  
a) 0    b) 1  
c)  $\infty$                                       d)  $1/4$  to  $1/6$
- 4) The canal, which may frequently encounter cross-drainage works, will be a: \_\_\_\_\_.  
a) watershed canal                      b) contour canal  
c) side slope canal                      d) none of them
- 5) Tortuosity of a meandering river is the ratio of \_\_\_\_\_.  
a) Meander belt to meander length  
b) Meander length to meander belt  
c) Curved length along the channel to the direct axial length of the river reach  
d) Direct axial length of the river reach to curved length along the channel
- 6) Aggrading rivers are \_\_\_\_\_.  
a) silting rivers                          b) scouring rivers  
c) rivers in regime                      d) meandering rivers
- 7) If the peak load for a power plant equals the plant capacity, then the ratio of capacity factor to load factor will be: \_\_\_\_\_.  
a) 1    b) 0  
c) <1                                        d) >1

- 8) The 'surcharge storage' in a dam reservoir is the volume of water stored between \_\_\_\_\_.  
a) minimum and maximum reservoir levels  
b) minimum and normal reservoir levels  
c) normal and maximum reservoir levels  
d) none of the above
- 9) Trap efficiency of a storage reservoir indicates the: \_\_\_\_\_.  
a) sediment volume trapped in the reservoir  
b) sediment volume let out from the reservoir  
c) sediment volume trapped in relation to the sediment volume entering the reservoir  
d) None of these
- 10) The horizontal component of the earthquake wave, producing instability in a dam, is the one, which acts: \_\_\_\_\_.  
a) towards the reservoir  
b) towards the dam  
c) both (a) and (b)  
d) none of the above
- 11) The most economical central angle of the arch rings in an arch dam, is: \_\_\_\_\_.  
a) 123°-34'  
b) 133°-34'  
c) 143°-34'  
d) 153°-34'
- 12) The most preferred soil for the central impervious core of a zoned embankment type of an earthen dam, is: \_\_\_\_\_.  
a) highly impervious clay  
b) highly pervious gravel  
c) coarse sand  
d) clay mixed with fine sand
- 13) When the water level standing against an earthen embankment, suddenly falls down, then there is an imminent risk of sliding failure, to the: \_\_\_\_\_.  
a) upstream slope  
b) downstream slope  
c) both (a) and (b)  
d) none of these
- 14) The 'safety valve' of a dam is its: \_\_\_\_\_.  
a) drainage gallery  
b) inspection gallery  
c) spillway  
d) outlet sluices



Seat No.	
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Set Q
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydraulic Structures & Water Power Engg**

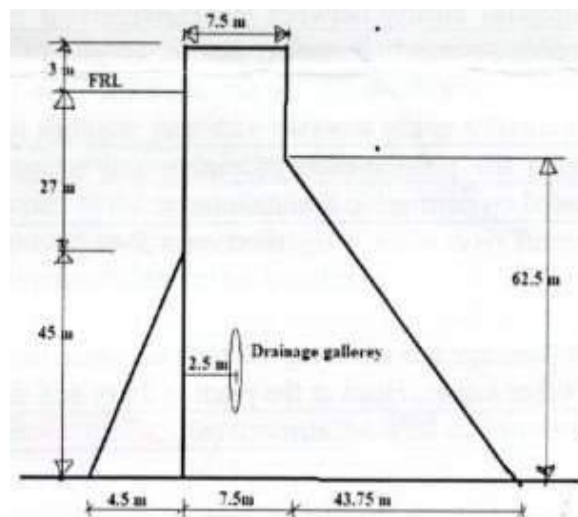
Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) In Section – I, Q. No. 3 is compulsory. Attempt any two questions from the remaining questions.  
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**Section – I**

- Q.2** a) What are the different methods of construction of earthen dam? Explain any one in details. **04**  
 b) What is mean by energy dissipation? Why it is required? Explain any one method of energy dissipation at downstream side of spillway. **05**
- Q.3** Section of Gravity dam along with drainage gallery is shown below. Analyse the stability of it when reservoir is full. Also find principal stress and shear stress at the toe and heel of dam. No tail water condition. Assume specific weight of concrete as  $23.544 \text{ kN./m}^3$ , coefficient of friction 0.7, and shear strength of concrete as  $1373.4 \text{ kN./m}^2$  **10**



- Q.4** a) What are the methods adopted to control seepage through the foundation of earthen dam? Explain any one with neat sketch. **04**  
 b) Explain different investigations those are carried out for planning of reservoir at a site. **05**
- Q.5** a) Enlist and explain different types of reservoirs. **04**  
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**Section – II**

- Q.6** a) Explain the term weir and enlist the criteria of site selection for K.T Weir. **04**  
b) What is meant by canal lining? What are its different types? Explain any one with its advantages and disadvantages. **05**
- Q.7** a) What is the role of cross drainage works in the canal alignment? Explain super passage with neat sketch. **04**  
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b) What are different methods that are used for river training and bank protection? Explain any two with neat sketches **05**
- Q.9** a) Explain the phenomenon of piping and under cutting for structures founded on permeable foundations. **04**  
b) A runoff river plant is installed on a river having minimum flow of 12 cumec. If the plant is used as a peak load plant operating only for 6 hours per day. Determine firm capacity of plant without pondage and with pondage but allowing 10% of the water to be lost in evaporation and other losses. Head at the plant is 15 m and the plant efficiency may be assumed as 80%. **06**

<b>Seat No.</b>	
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# Hydraulic Structures & Water Power Engg

Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

14

- 1) The canal, which may frequently encounter cross-drainage works, will be a: \_\_\_\_\_.
  - a) watershed canal
  - b) contour canal
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- 2) Tortuosity of a meandering river is the ratio of \_\_\_\_\_.
  - a) Meander belt to meander length
  - b) Meander length to meander belt
  - c) Curved length along the channel to the direct axial length of the river reach
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- 3) Aggrading rivers are \_\_\_\_\_.
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  - b) scouring rivers
  - c) rivers in regime
  - d) meandering rivers
- 4) If the peak load for a power plant equals the plant capacity, then the ratio of capacity factor to load factor will be: \_\_\_\_\_.
  - a) 1
  - b) 0
  - c)  $<1$
  - d)  $>1$
- 5) The 'surcharge storage' in a dam reservoir is the volume of water stored between \_\_\_\_\_.
  - a) minimum and maximum reservoir levels
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a)  $123^{\circ}-34'$                                       b)  $133^{\circ}-34'$   
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- 9) The most preferred soil for the central impervious core of a zoned embankment type of an earthen dam, is: \_\_\_\_\_.  
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a) less for more porous soils                      b) more for more porous soils  
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- 14) The value of Khosla's safe exit gradient for usually met alluvial river soils of our country, is: \_\_\_\_\_.  
a) 0    b) 1  
c)  $\infty$     d)  $1/4$  to  $1/6$

Seat No.	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydraulic Structures & Water Power Engg**

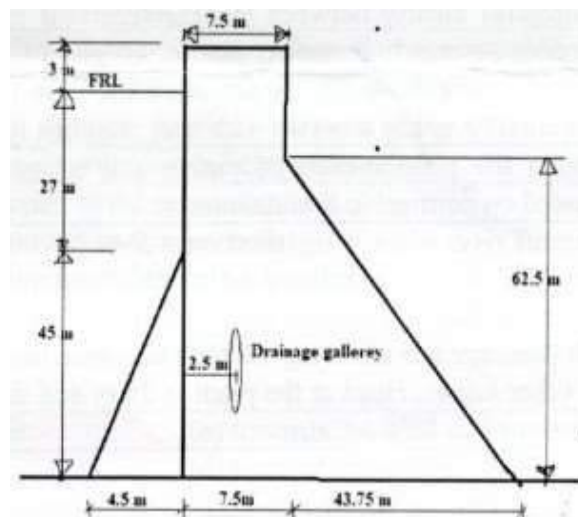
Day & Date: Thursday, 16-02-2023  
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**Section – I**

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- Q.3** Section of Gravity dam along with drainage gallery is shown below. Analyse the stability of it when reservoir is full. Also find principal stress and shear stress at the toe and heel of dam. No tail water condition. Assume specific weight of concrete as  $23.544 \text{ kN./m}^3$ , coefficient of friction 0.7, and shear strength of concrete as  $1373.4 \text{ kN./m}^2$  **10**



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<b>Seat No.</b>	
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# Hydraulic Structures & Water Power Engg

Max. Marks: 70

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Duration: 30 Minutes

Marks: 14

14

- 1) When the water level standing against an earthen embankment, suddenly falls down, then there is an imminent risk of sliding failure, to the: \_\_\_\_\_.  
a) upstream slope                      b) downstream slope  
c) both (a) and (b)                  d) none of these
- 2) The 'safety valve' of a dam is its: \_\_\_\_\_.  
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Seat No.	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Hydraulic Structures & Water Power Engg**

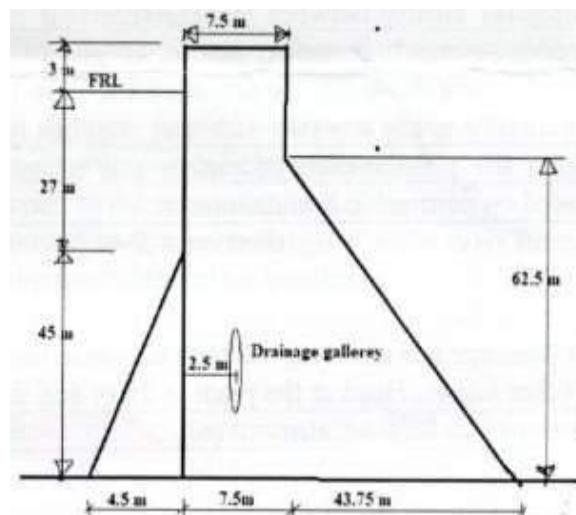
Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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**Section – II**

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**Seat  
No.**

Max. Marks: 70

Marks: 14

Page 1 of 20

- 9) The mode of failure of a very short masonry member having  $h/t$  ratio of less than 4 is by \_\_\_\_\_.
  - a) Shear
  - b) Vertical tensile splitting
  - c) Buckling
  - d) Any of the above
- 10) If the ratio of center to center spacing of intersecting walls to actual thickness of intersecting wall is more than 20, then the stiffening coefficient for wall proper will be \_\_\_\_\_.
  - a) 0
  - b) Between 0 and 1
  - c) 1
  - d) Greater than 1
- 11) For earthquake resistant masonry buildings, the vertical distance between openings one above the other in a load bearing wall shall not be less than \_\_\_\_\_.
  - a) 50 cm
  - b) 60 cm
  - c) 75 cm
  - d) 100 cm
- 12) The effective height of free-standing non-load bearing wall and column respectively will be \_\_\_\_\_.
  - a)  $1.0H$  and  $1.0H$
  - b)  $1.5H$  and  $1.5H$
  - c)  $2.0H$  and  $1.5H$
  - d)  $2.0H$  and  $2.0H$
- 13) In a cavity wall, both leaves of which are load bearing, the effective thickness is taken as \_\_\_\_\_.
  - a) Sum of thickness of both leaf
  - b) Two-third of the sum of thickness of both the leaves
  - c) Actual thickness of the stronger leaf
  - d) Larger of b and c
- 14) Rich cement mortars are more liable to cracking as compared to lean mortars because rich mortars have \_\_\_\_\_.
  - a) High shrinkage
  - b) less strength
  - c) Both a and b
  - d) none

Seat No.	
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**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Masonry Structures**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

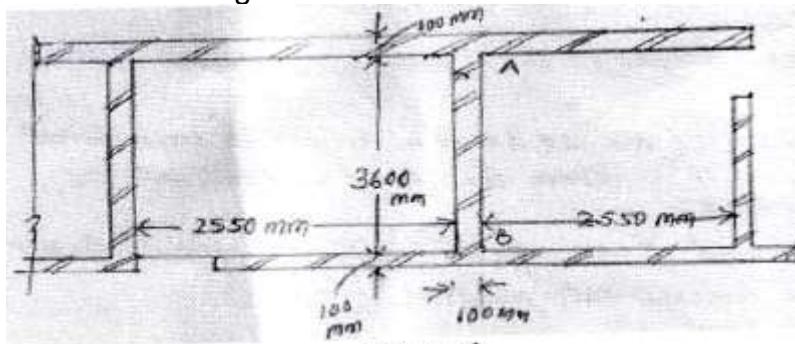
Max. Marks: 56

- Instructions:** 1) Q2 and Q6 are compulsory.  
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 2) Figures to the right indicate full marks  
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 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

- a) Enlist different types of mortars used in masonry construction. **02**  
 b) Design an interior wall of two storied building with 100mm thick RCC slab of effective span 2.65m. The wall is 3.6m long and is stiffened at both the ends by 100mm thick intersecting walls as shown in **Figure 1** below. The ceiling height of each floor is 3m. Considering basic compressive stress as  $0.96 \text{ N/mm}^2$  design wall AB. **08**

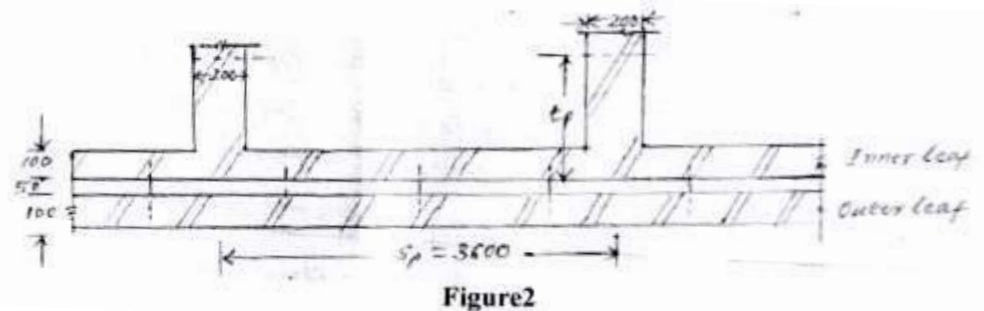


**Figure1**

Take Live Load from  
 Roof  $1.5 \text{ kN/m}^2$   
 Floor  $2 \text{ kN/m}^2$   
 Weight of  
 Roof  $1.96 \text{ kN/m}^2$   
 Floor  $0.2 \text{ kN/m}^2$

**Q.3 Attempt the following questions.**

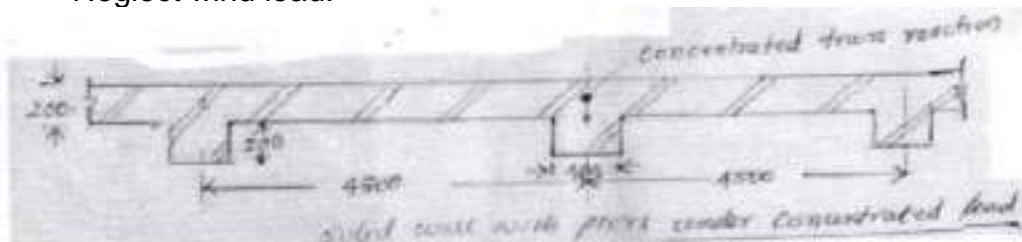
- a) Discuss different types of classification of bricks. 02  
 b) Design an interior wall of three storied building with ceiling height 3m. The wall is stiffened by intersecting walls 200mm thick at 3600mm c/c as shown in **Figure 2**. 07



Take Load from  
 Roof 16kN/m  
 Floor 12.5kN/m

**Q.4 Attempt the following questions.**

- a) Explain in detail the properties of mortar. 02  
 b) Design an exterior wall of a workshop building 3.6m high carrying steel truss at the top with 4.5m spacing. The wall is securely tied at the roof and floor level as shown below in **Figure 3**. The loading may be considered as follows.  
 Concentrated reaction from truss at top of wall = 30kN.  
 Roof load = 7kN/m.  
 Neglect wind load. 07

**Figure3****Q.5 Attempt the following questions.**

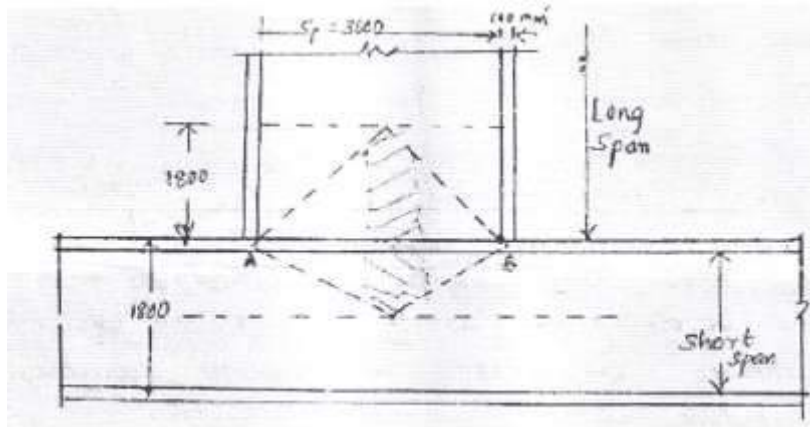
- a) Define wall and list different types of walls with the help of neat sketches. 09  
 b) Explain briefly the factors affecting compressive strength of masonry.  
 c) Write short notes on effective height of masonry wall.

**Section – II****Q.6 Attempt the following questions.**

- a) Give the limitations of reinforced masonry. 02  
 b) Design an interior wall of two storied wall carrying concrete slab with ceiling height 3m. The wall is stiffened by intersecting walls 100mm thick at 3600mm c/c. also the wall has door opening size of 900 x 2000 mm at a distance 200mm from one side of intersecting walls. 08  
 Take Load from  
 Roof 15kN/m  
 Floor 12.5kN/m

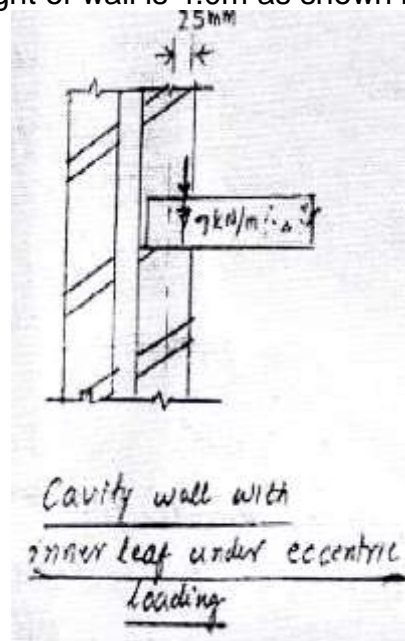
**Q.7 Attempt the following questions.**

- a) Design an interior cross wall AB of a building supporting unequal roof slabs as shown in **Figure 4** below. Assuming triangular bearing pressure and loading as  $10 \text{ kN/m}^2$ . The storey height is  $3.8\text{m}$  and the wall is fixed to foundation block below.

**Figure4****Q.8 Attempt the following questions.**

09

- a) Design an external wall of single storied building. The inner leaf of which supports an eccentric load of  $7\text{kN/m}$  at an eccentricity of  $25\text{mm}$ . The wall is unstiffened at one end which supports a concrete roof at top and resist over a foundation block. Height of wall is  $4.0\text{m}$  as shown below in **Figure 5**.

**Figure5****Q.9 Attempt the following questions.**

09

- Explain the design criteria of walls subjected to transverse loading.
- Briefly discuss the steps involved in the design of eccentrically loaded solid wall.
- Explain the steps involved in consideration of loads and design of masonry wall with openings.

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

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Marks: 14

1) For a 200mm thick solid masonry wall having 3.2m height with both ends restrained against deformation, the slenderness ratio is \_\_\_\_\_.

- Page 6 of 20





Seat No.	
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Set	Q
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**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Masonry Structures**

Day & Date: Monday, 20-02-2023  
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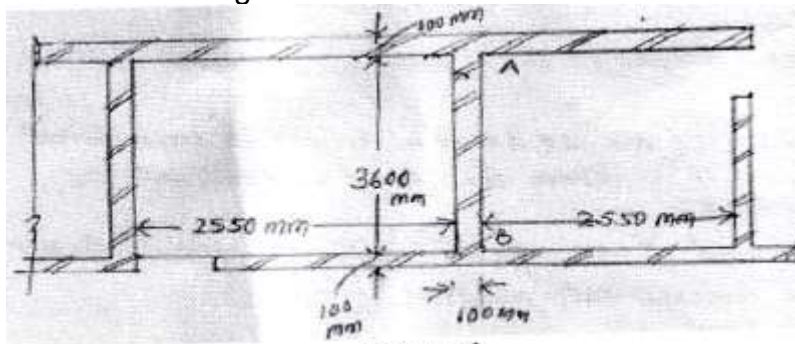
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**Section – I**

**Q.2 Attempt the following questions.**

- a) Enlist different types of mortars used in masonry construction. **02**  
 b) Design an interior wall of two storied building with 100mm thick RCC slab of effective span 2.65m. The wall is 3.6m long and is stiffened at both the ends by 100mm thick intersecting walls as shown in **Figure 1** below. The ceiling height of each floor is 3m. Considering basic compressive stress as  $0.96 \text{ N/mm}^2$  design wall AB. **08**

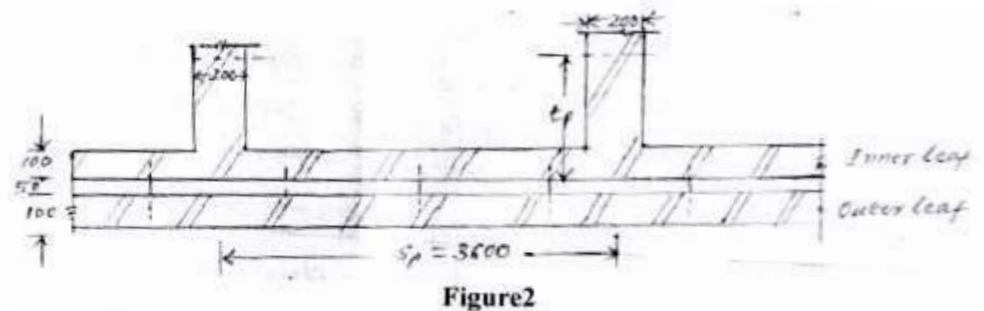


**Figure1**

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 Floor  $2 \text{ kN/m}^2$   
 Weight of  
 Roof  $1.96 \text{ kN/m}^2$   
 Floor  $0.2 \text{ kN/m}^2$

**Q.3 Attempt the following questions.**

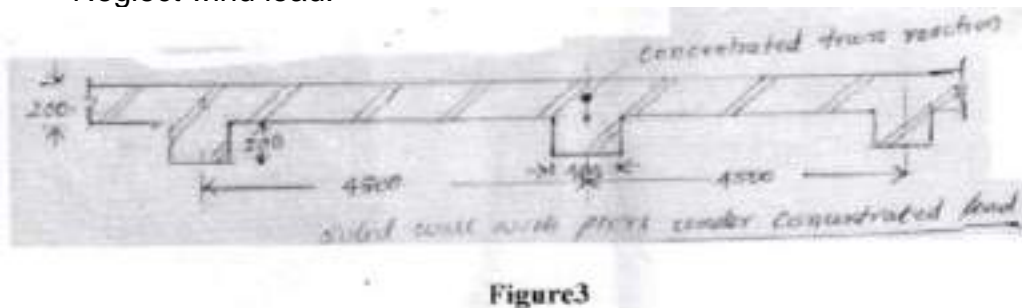
- a) Discuss different types of classification of bricks. 02  
 b) Design an interior wall of three storied building with ceiling height 3m. The wall is stiffened by intersecting walls 200mm thick at 3600mm c/c as shown in **Figure 2**. 07



Take Load from  
 Roof 16kN/m  
 Floor 12.5kN/m

**Q.4 Attempt the following questions.**

- a) Explain in detail the properties of mortar. 02  
 b) Design an exterior wall of a workshop building 3.6m high carrying steel truss at the top with 4.5m spacing. The wall is securely tied at the roof and floor level as shown below in **Figure 3**. The loading may be considered as follows.  
 Concentrated reaction from truss at top of wall = 30kN.  
 Roof load = 7kN/m.  
 Neglect wind load. 07

**Q.5 Attempt the following questions.**

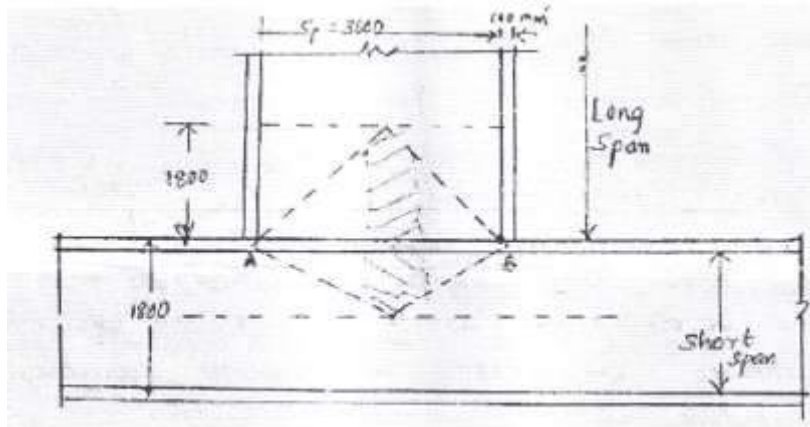
- a) Define wall and list different types of walls with the help of neat sketches. 09  
 b) Explain briefly the factors affecting compressive strength of masonry.  
 c) Write short notes on effective height of masonry wall.

**Section – II****Q.6 Attempt the following questions.**

- a) Give the limitations of reinforced masonry. 02  
 b) Design an interior wall of two storied wall carrying concrete slab with ceiling height 3m. The wall is stiffened by intersecting walls 100mm thick at 3600mm c/c. also the wall has door opening size of 900 x 2000 mm at a distance 200mm from one side of intersecting walls. 08  
 Take Load from  
 Roof 15kN/m  
 Floor 12.5kN/m

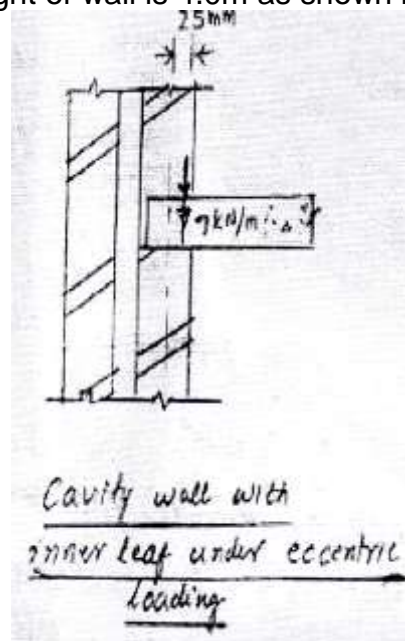
**Q.7 Attempt the following questions.**

- a) Design an interior cross wall AB of a building supporting unequal roof slabs as shown in **Figure 4** below. Assuming triangular bearing pressure and loading as  $10 \text{ kN/m}^2$ . The storey height is  $3.8\text{m}$  and the wall is fixed to foundation block below.

**Figure4****Q.8 Attempt the following questions.**

09

- a) Design an external wall of single storied building. The inner leaf of which supports an eccentric load of  $7\text{kN/m}$  at an eccentricity of  $25\text{mm}$ . The wall is unstiffened at one end which supports a concrete roof at top and resist over a foundation block. Height of wall is  $4.0\text{m}$  as shown below in **Figure 5**.

**Figure5****Q.9 Attempt the following questions.**

09

- Explain the design criteria of walls subjected to transverse loading.
- Briefly discuss the steps involved in the design of eccentrically loaded solid wall.
- Explain the steps involved in consideration of loads and design of masonry wall with openings.

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to mention the Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

1) For earthquake resistant masonry buildings, the vertical distance between openings one above the other in a load bearing wall shall not be less than \_\_\_\_\_.

- a) 50 cm                      b) 60 cm  
c) 75 cm                      d) 100 cm

2) The effective height of free-standing non-load bearing wall and column respectively will be \_\_\_\_\_.

- a) 1.0H and 1.0H      b) 1.5H and 1.5H  
c) 2.0H and 1.5H      d) 2.0H and 2.0H

3) In a cavity wall, both leaves of which are load bearing, the effective thickness is taken as \_\_\_\_\_.

- Sum of thickness of both leaf
- Two-third of the sum of thickness of both the leaves
- Actual thickness of the stronger leaf
- Larger of b and c

4) Rich cement mortars are more liable to cracking as compared to lean mortars because rich mortars have \_\_\_\_\_.

- a) High shrinkage                      b) less strength  
c) Both a and b                        d) none

5) The code for masonry structures, "IS 1905 - 1987 Code of practice for structural use of unreinforced masonry" was published in year \_\_\_\_\_.

- a) 1968                      b) 1969  
c) 1970                      d) 1971

**6)** In As per IS 1905 a masonry wall is an isolated load bearing vertical member width of which does not exceeds \_\_\_\_\_ times its thickness.

- a) 2                      b) 3  
c) 4                      d) 5

7) Slenderness ratio of masonry wall depends upon \_\_\_\_\_.

- a) Height                                      b) Thickness  
c) both a and b                            d) none

- [illegible]

Seat No.	
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**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Masonry Structures**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

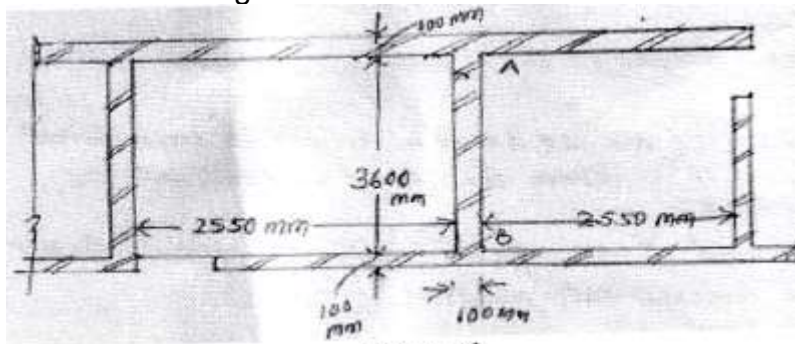
Max. Marks: 56

- Instructions:** 1) Q2 and Q6 are compulsory.  
 2) Attempt any 2 questions from the remaining questions in both Sections I and II respectively.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

- a) Enlist different types of mortars used in masonry construction. **02**  
 b) Design an interior wall of two storied building with 100mm thick RCC slab of effective span 2.65m. The wall is 3.6m long and is stiffened at both the ends by 100mm thick intersecting walls as shown in **Figure 1** below. The ceiling height of each floor is 3m. Considering basic compressive stress as  $0.96 \text{ N/mm}^2$  design wall AB. **08**

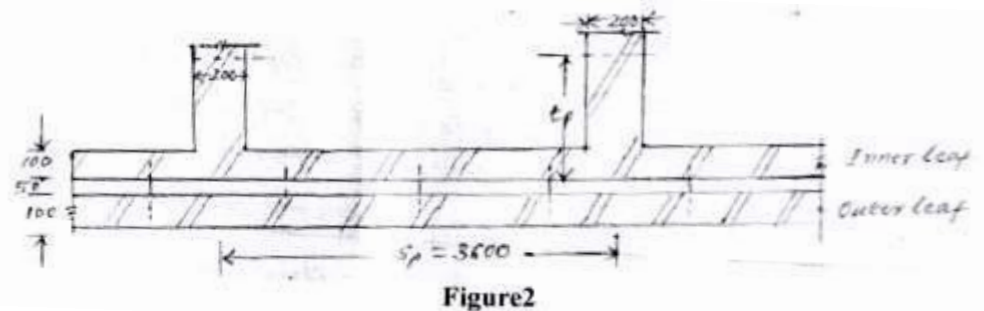


**Figure 1**

Take Live Load from  
 Roof  $1.5 \text{ kN/m}^2$   
 Floor  $2 \text{ kN/m}^2$   
 Weight of  
 Roof  $1.96 \text{ kN/m}^2$   
 Floor  $0.2 \text{ kN/m}^2$

**Q.3 Attempt the following questions.**

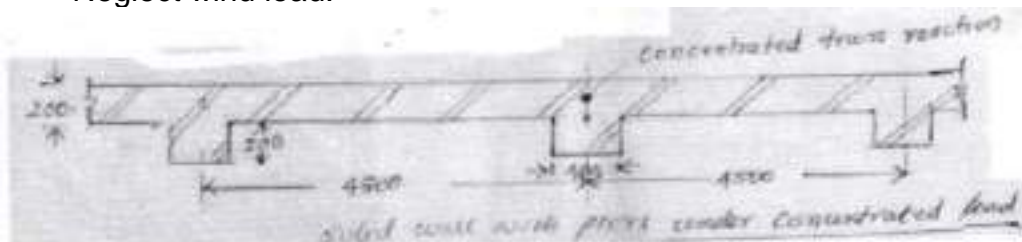
- a) Discuss different types of classification of bricks. 02  
 b) Design an interior wall of three storied building with ceiling height 3m. The wall is stiffened by intersecting walls 200mm thick at 3600mm c/c as shown in **Figure 2**. 07



Take Load from  
 Roof 16kN/m  
 Floor 12.5kN/m

**Q.4 Attempt the following questions.**

- a) Explain in detail the properties of mortar. 02  
 b) Design an exterior wall of a workshop building 3.6m high carrying steel truss at the top with 4.5m spacing. The wall is securely tied at the roof and floor level as shown below in **Figure 3**. The loading may be considered as follows.  
 Concentrated reaction from truss at top of wall = 30kN.  
 Roof load = 7kN/m.  
 Neglect wind load. 07

**Figure3****Q.5 Attempt the following questions.**

- a) Define wall and list different types of walls with the help of neat sketches. 09  
 b) Explain briefly the factors affecting compressive strength of masonry.  
 c) Write short notes on effective height of masonry wall.

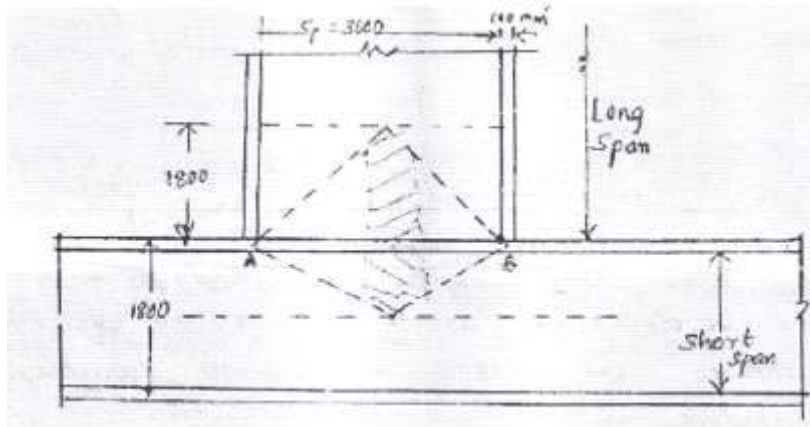
**Section – II****Q.6 Attempt the following questions.**

- a) Give the limitations of reinforced masonry. 02  
 b) Design an interior wall of two storied wall carrying concrete slab with ceiling height 3m. The wall is stiffened by intersecting walls 100mm thick at 3600mm c/c. also the wall has door opening size of 900 x 2000 mm at a distance 200mm from one side of intersecting walls. 08  
 Take Load from  
 Roof 15kN/m  
 Floor 12.5kN/m



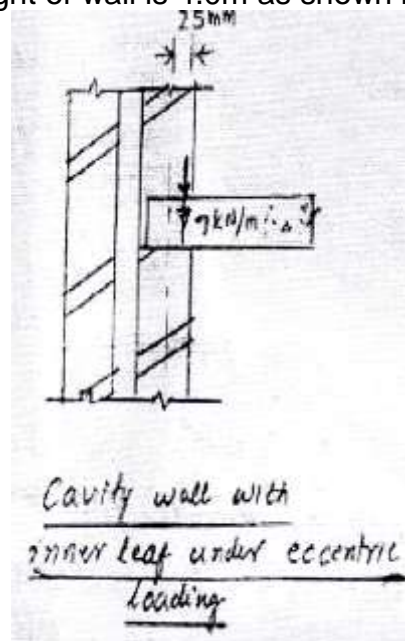
**Q.7 Attempt the following questions.**

- a) Design an interior cross wall AB of a building supporting unequal roof slabs as shown in **Figure 4** below. Assuming triangular bearing pressure and loading as  $10 \text{ kN/m}^2$ . The storey height is  $3.8 \text{ m}$  and the wall is fixed to foundation block below.

**Figure4****Q.8 Attempt the following questions.**

09

- a) Design an external wall of single storied building. The inner leaf of which supports an eccentric load of  $7 \text{ kN/m}$  at an eccentricity of  $25 \text{ mm}$ . The wall is unstiffened at one end which supports a concrete roof at top and resist over a foundation block. Height of wall is  $4.0 \text{ m}$  as shown below in **Figure 5**.

**Figure5****Q.9 Attempt the following questions.**

09

- Explain the design criteria of walls subjected to transverse loading.
- Briefly discuss the steps involved in the design of eccentrically loaded solid wall.
- Explain the steps involved in consideration of loads and design of masonry wall with openings.

**Seat  
No.**

Max. Marks: 70

Marks: 14

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- 8) In a cavity wall, both leaves of which are load bearing, the effective thickness is taken as \_\_\_\_\_.  
a) Sum of thickness of both leaf  
b) Two-third of the sum of thickness of both the leaves  
c) Actual thickness of the stronger leaf  
d) Larger of b and c
- 9) Rich cement mortars are more liable to cracking as compared to lean mortars because rich mortars have \_\_\_\_\_.  
a) High shrinkage  
b) less strength  
c) Both a and b  
d) none
- 10) The code for masonry structures, "IS 1905 - 1987 Code of practice for structural use of unreinforced masonry" was published in year \_\_\_\_\_.  
a) 1968  
b) 1969  
c) 1970  
d) 1971
- 11) In As per IS 1905 a masonry wall is an isolated load bearing vertical member width of which does not exceeds \_\_\_\_\_ times its thickness.  
a) 2  
b) 3  
c) 4  
d) 5
- 12) Slenderness ratio of masonry wall depends upon \_\_\_\_\_.  
a) Height  
b) Thickness  
c) both a and b  
d) none
- 13) For a masonry wall with both ends restrained, the effective height if \_\_\_\_\_.  
a)  $0.75H_a$   
b)  $0.80H_a$   
c)  $0.95H_a$   
d)  $1.0H_a$
- 14) Test carried out on brick materials are \_\_\_\_\_.  
a) soundness  
b) hardness  
c) structure  
d) all above

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**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Masonry Structures**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

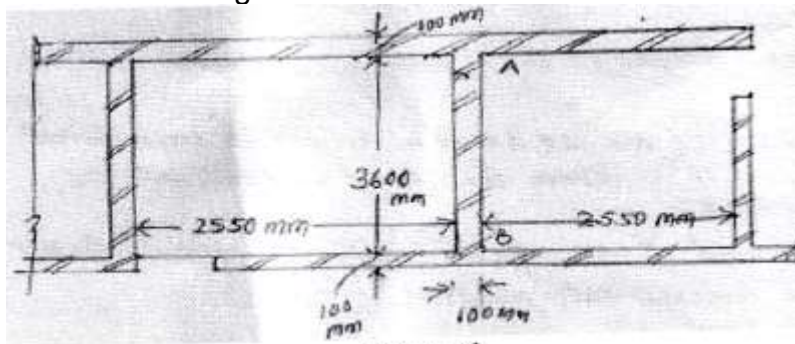
Max. Marks: 56

- Instructions:**
- 1) Q2 and Q6 are compulsory.
  - 2) Attempt any 2 questions from the remaining questions in both Sections I and II respectively.
  - 2) Figures to the right indicate full marks
  - 3) Assume suitable data wherever needed and mention it clearly.
  - 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

- a) Enlist different types of mortars used in masonry construction. **02**
- b) Design an interior wall of two storied building with 100mm thick RCC slab of effective span 2.65m. The wall is 3.6m long and is stiffened at both the ends by 100mm thick intersecting walls as shown in **Figure 1** below. The ceiling height of each floor is 3m. Considering basic compressive stress as  $0.96 \text{ N/mm}^2$  design wall AB. **08**

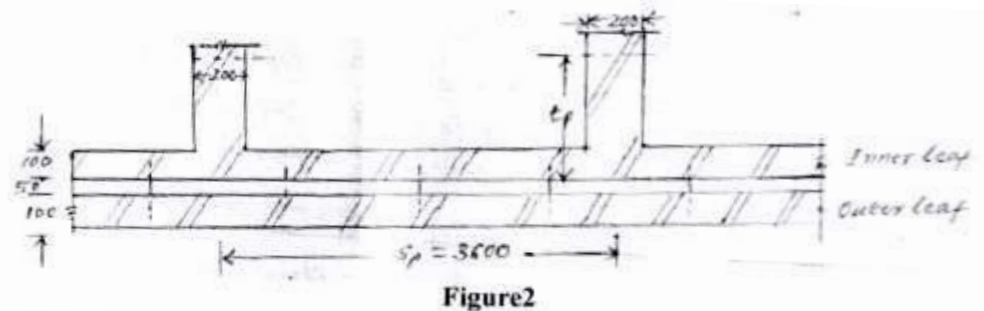


**Figure1**

Take Live Load from  
 Roof  $1.5 \text{ kN/m}^2$   
 Floor  $2 \text{ kN/m}^2$   
 Weight of  
 Roof  $1.96 \text{ kN/m}^2$   
 Floor  $0.2 \text{ kN/m}^2$

**Q.3 Attempt the following questions.**

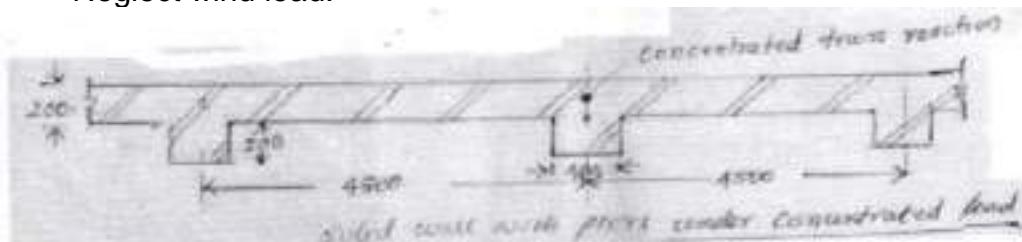
- a) Discuss different types of classification of bricks. 02  
 b) Design an interior wall of three storied building with ceiling height 3m. The wall is stiffened by intersecting walls 200mm thick at 3600mm c/c as shown in **Figure 2**. 07



Take Load from  
 Roof 16kN/m  
 Floor 12.5kN/m

**Q.4 Attempt the following questions.**

- a) Explain in detail the properties of mortar. 02  
 b) Design an exterior wall of a workshop building 3.6m high carrying steel truss at the top with 4.5m spacing. The wall is securely tied at the roof and floor level as shown below in **Figure 3**. The loading may be considered as follows.  
 Concentrated reaction from truss at top of wall = 30kN.  
 Roof load = 7kN/m.  
 Neglect wind load. 07

**Figure3****Q.5 Attempt the following questions.**

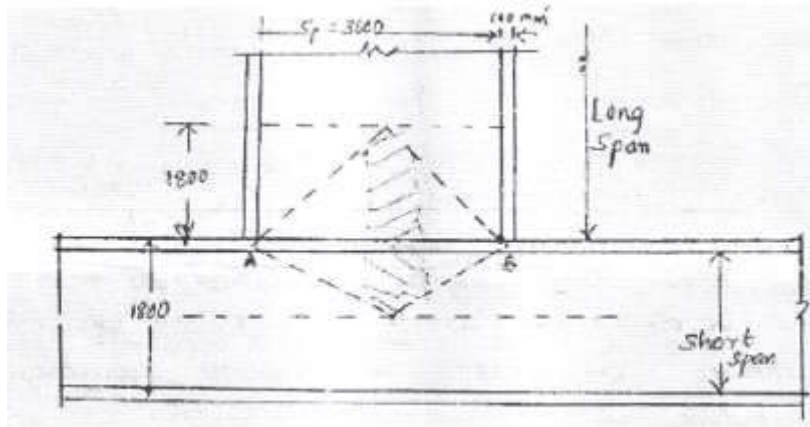
- a) Define wall and list different types of walls with the help of neat sketches. 09  
 b) Explain briefly the factors affecting compressive strength of masonry.  
 c) Write short notes on effective height of masonry wall.

**Section – II****Q.6 Attempt the following questions.**

- a) Give the limitations of reinforced masonry. 02  
 b) Design an interior wall of two storied wall carrying concrete slab with ceiling height 3m. The wall is stiffened by intersecting walls 100mm thick at 3600mm c/c. also the wall has door opening size of 900 x 2000 mm at a distance 200mm from one side of intersecting walls. 08  
 Take Load from  
 Roof 15kN/m  
 Floor 12.5kN/m

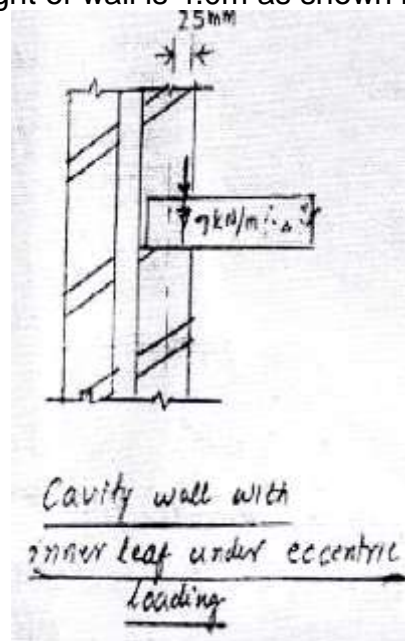
**Q.7 Attempt the following questions.**

- a) Design an interior cross wall AB of a building supporting unequal roof slabs as shown in **Figure 4** below. Assuming triangular bearing pressure and loading as  $10 \text{ kN/m}^2$ . The storey height is  $3.8 \text{ m}$  and the wall is fixed to foundation block below.

**Figure4****Q.8 Attempt the following questions.**

09

- a) Design an external wall of single storied building. The inner leaf of which supports an eccentric load of  $7 \text{ kN/m}$  at an eccentricity of  $25 \text{ mm}$ . The wall is unstiffened at one end which supports a concrete roof at top and resist over a foundation block. Height of wall is  $4.0 \text{ m}$  as shown below in **Figure 5**.

**Figure5****Q.9 Attempt the following questions.**

09

- Explain the design criteria of walls subjected to transverse loading.
- Briefly discuss the steps involved in the design of eccentrically loaded solid wall.
- Explain the steps involved in consideration of loads and design of masonry wall with openings.

<b>Seat No.</b>	
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**T. Y. (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022****CIVIL ENGINEERING****Pavement Design**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

3) Figures to the right indicates full marks

4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

1) Identify the correct order of construction of flexible pavement from top to bottom.

- 1) Subgrade
- 2) Prime Coat
- 3) Tack Coat
- 4) Dense Bituminous Macadam
- 5) Bituminous Concrete
- 6) Wet Mix Macadam
- 7) Granular Subbase

Select the correct answer from below options:

- |                      |                      |
|----------------------|----------------------|
| a) 1,2,3,4,5,6,7     | b) 1,7,6,2,4,3 and 5 |
| c) 1,6,7,3,5,2 and 4 | d) 5,3,4,2,6,7 and 1 |

2) In three-layer elastic system of pavement design, what is Layer-1,2 and 3 (From top to Bottom).

- a) Layer-1-Subgrade, Layer-2-BC and DBM and Layer-3-WMM and GSB
- b) Layer-1- WMM and GSB, Layer-2-BC and DBM and Layer-3- Subgrade
- c) Layer-1-Subgrade, Layer-2- WMM and GSB and Layer-3- BC and DBM
- d) Layer-1- BC and DBM, Layer-2- WMM and GSB, Layer-3-Subgrade

3) \_\_\_\_\_ is a multiplier to convert the given number of commercial vehicles having different axle configurations and different axle weights into an equivalent number of standard axle load (80 kN single axle with dual wheels) repetitions.

- a) Lane Distribution Factor
- b) Vehicle Damage Factor
- c) Directional Distribution Factor
- d) Cumulative no of standard axles

- 4) Identify the correct statement regarding the locations of critical strains in the design of flexible pavement.
- Tensile strain at the bottom of subgrade and vertical compressive strain on top of bituminous layer
  - Tensile strain at the top of subgrade and vertical compressive strain on bottom of bituminous layer
  - Tensile strain at the bottom of bituminous layer and vertical compressive strain on top of subgrade
  - Vertical compressive strain at the bottom of subgrade and Tensile strain at the bottom of bituminous layer
- 5) The vehicle carries a rear single axle weight of 16 tonnes, what is the EWLF? (Use fourth power rule and consider standard axle weight as 8.16 tonne)
- 15.78
  - 14.78
  - 13.78
  - 12.78
- 6) The transverse distribution of heavy vehicles across the width of the carriageway is called \_\_\_\_\_.
- Equivalent wheel load factor
  - Lane Distribution Factor
  - Vehicle Damage Factor
  - Equivalent Single Wheel Load Factor
- 7) In rigid pavement, when the width of the slab exceeds 4.5 to 5.0m, the type of joint required is?
- Contraction joint
  - Construction joint
  - Expansion joint
  - Longitudinal joint
- 8) Identify the correct order of concrete pavement layers in correct order from bottom to top.
- GSB, Subgrade, DEC, PQC and 125-micron Polyethylene sheet
  - 125-micron Polyethylene sheet, GSB, Subgrade, DLC and PQC
  - DLC, PQC, 125-micron Polyethylene sheet, GSB and Subgrade
  - Subgrade, GSB, DLC, 125-micron Polyethylene sheet and PQC
- 9) The standard wheel load considered for the design of flexible pavement using IIT PAVE software is: \_\_\_\_\_.
- 10 kN on each single wheel
  - 20 kN on each single wheel
  - 30 kN on each single wheel
  - 40 kN on each single wheel
- 10) Arrange the correct sequence of design steps of flexible pavement design using IRC-37-2018.
- Select a trial thickness
  - Actual strains using IIT PAVE
  - Calculation of Allowable strains
  - Calculation of resilient modulus of all materials
  - Comparison of Actual strains and allowable strains
- 1, 2, 3, 4, 5
  - 5, 4, 2, 3, 1
  - 1, 4, 3, 2, 5
  - 4, 1, 5, 3, 2
- 11) In flexible pavement, the CTB and CTSB layers are designed based on \_\_\_\_\_.
- CBR Value of material
  - Modulus of subgrade reaction
  - Flexural strength
  - Unconfined Compressive strength



- 12) The main purpose of the Dry Lean Concrete (DLC) layer in rigid pavement is to \_\_\_\_\_.  
a) Provide good bond between two layers  
b) Provide a good riding surface  
c) Provide a effective drainage of pavement system  
d) Provide a uniform, stable and permanent support to the concrete slab laid over it
- 13) As per IS-456-2000, the flexural strength can be calculated using the below equation: ( $F_{cr}$  - *Flexural strength of concrete* &  $f_{ck}$  - *characteristic compressive strength of concrete*)  
a)  $F_{cr} = 0.7\sqrt{f_{ck}}$   
b)  $F_{cr} = 0.78\sqrt{f_{ck}}$   
c)  $F_{cr} = 0.75\sqrt{f_{ck}}$   
d)  $F_{cr} = 0.8\sqrt{f_{ck}}$
- 14) The dowel bars are designed based on \_\_\_\_\_.  
a) Yield stress of dowel bars  
b) Bearing stress of dowel bars  
c) Tensile strength of dowel bars  
d) Allowable working stress in dowel bar

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**T. Y. (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Pavement Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I, Q. No. 2 is compulsory. Solve any one full question from remaining question no. 3 and 4  
 2) In Section – II, Q. No. 5 is compulsory. Solve any one full question from remaining question no. 6 and 7  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions** **10**

- a) Draw a neat sketch of flexible pavement and show component parts of all layers. Briefly explain function of all layers.
- b) Explain ESWL. Briefly explain the graphical method of determination of ESWL.
- c) What is VDF? Determine the Equivalent Wheel Load Factor or VDF value of the following two axle loads in terms of the standard axle load of 8.16 tonne.
  - 1) LCV with rear axle load of 2.0t
  - 2) HCV with rear axle load of 15.5t

**Q.3 Answer any two questions** **18**

- a) A flexible pavement of thickness 48cm is laid over a subgrade. A circular load of 16cm with uniform contact pressure  $6.5\text{kg/cm}^2$  is applied. Assume the elastic modulus of the subgrade as well as pavement layer to be  $900\text{kg/cm}^2$ . Use Deflection Factor chart given in **Fig-I**. Assuming homogenous elastic single layer system determine.
  - 1) The deflection of the pavement surface under the center of the load
  - 2) The total thickness of flexible pavement using data Design Wheel Load=5000kg, Tyre pressure= $6.0\text{kg/cm}^2$ , Elastic modulus= $150\text{kg/cm}^2$  and permissible deflection=0.25cm
- b) If the CBR of the soil used in the upper 500 mm of embankment is 8% and the CBR of the borrow soil used for preparing the 500 mm thick compacted subgrade above embankment is 20%, what is the effective subgrade Modulus/CBR for design of flexible pavement? Consider Poisson's ratio=0.35. Use surface deflection,  $\delta=1.41\text{mm}$  from IIT PAVE software. Draw a neat sketch of equivalent subgrade system diagram.
- c) Design a bituminous pavement as per IRC-37-2018 with Granular Base and Sub-base layers using the following input data.
  - 1) Four lane divided carriageway
  - 2) Initial traffic in the year of completion of construction = 5000 cvpd (two-way)
  - 3) Traffic growth rate per annum = 6.0 per cent
  - 4) Design life period = 20 years
  - 5) Vehicle damage factor = 5.2

- 6) Effective CBR of subgrade estimated = 7 %
- 7) Marshall mix design carried out on the bituminous mix to be used in the bottom bituminous layer (DBM) for an air void content of 3 % resulted in an effective bitumen content (by volume) of 11.5 %
- 8) Lane Distribution Factor=0.75
- 9) Computed horizontal tensile strain using IIT PAVE software = 0.000146.
- 10) Computed vertical compressive strain using IIT PAVE software = 0.000243
- 11) Consider VG-40 grade bitumen with resilient modulus of 3000 Mpa
- 12) Poisson's ratio=0.35

Assume trial thickness as below: BC-40mm, DBM-150mm, WMM-250mm and GSB- 230mm.

**Q.4 Answer any three questions**

**18**

- a) Draw a neat sketch of rigid pavement and show component parts of all layers. Briefly explain function of all layers.
- b) With sketch describe the significance of design wheel load and contact pressure in design of pavement.
- c) Find ESWT at depths of 50mm, 200mm and 400mm for a dual wheel carrying 2044 kN each. The centre-to-centre tyre spacing is 200mm and distance between the walls of the two tyres is 100 mm. Use (log) equation to calculate ESWL.
- d) Plate bearing tests were conducted using 30cm diameter plate on soil subgrade and over a base course of thickness 45cm. The pressure yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm<sup>2</sup> and 8kg/cm<sup>2</sup> respectively. Design the thickness requirement of flexible pavement for a wheel load of 5100kg with tyre pressure of 8.0kg/cm<sup>2</sup> for an allowable deflection of 0.5cm using Burmister two-layer deflection factor chart shown in **Fig-II**.

**Section – II**

**Q.5 Answer any two questions**

**10**

- a) What is the objective of providing dowel bars and tie bars in rigid pavement?
- b) With a diagram explain the working principle of Benkelman beam for measurement of pavement deflection.
- c) C.C. Pavement is constructed using the following data:
  - 1) Modulus of elasticity  $3.3 \times 10^5$  kg/cm<sup>2</sup>
  - 2) Poisson's ratio=0.15
  - 3) Thickness of CC pavement = 18 cm
  - 4) Modulus of subgrade reaction-25kg/cm<sup>3</sup>
  - 5) Wheel load = 4100 kg
  - 6) Radius of loaded area = 12 cm
 Calculate stresses at Interior, Edge and corner by Westergaard's method.

**Q.6 Answer any two questions**

- a) Determine the warping stresses at interior, edge and corner of a 25cm thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction  $K$  is  $6.9\text{kg/cm}^3$  and radius of loaded area is 15cm. Assume temperature differential during day to be  $0.6^\circ\text{C}$  per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of  $0.4^\circ\text{C}$  per cm slab thickness during the night (for warping stress at the corner). Assume  $e=10 \times 10^{-6}\text{per}^\circ\text{C}$ ,  $E=3 \times 10^5 \text{ kg/cm}^2$ ,  $\mu=0.15$ . Use Bradbury chart given in **Figure-III**.
- b) Design the thickness cement concrete pavement as per IRC-58-2002 for a two-lane two-way National Highway in Gujarat State. The total two-way traffic is 3000 commercial vehicles per day at the end of the construction period. The design parameters are:
- 1) Flexural strength of Concrete= $81.5\text{kg/cm}^2$
  - 2) Effective Modulus of subgrade reaction of the DLC= $24.25\text{kg/cm}^3$
  - 3) Elastic modulus of concrete= $40417\text{kg/cm}^2$
  - 4) Poisson's ratio= $0.15$
  - 5) CBR of subgrade soil= $6.0\%$
  - 6) Coefficient of thermal coefficient= $10 \times 10^{-6}/^\circ\text{C}$
  - 7) Rate of traffic increase= $0.075$
  - 8) Spacing of contraction joints= $4.5\text{m}$
  - 9) Width of slab= $3.5\text{m}$
  - 10) Load Safety Factor= $1.2$
  - 11) Assume Trial Thickness= $33\text{cm}$
  - 12) The temperature differential= $21^\circ\text{C}$
  - 13) Tyre Pressure= $8\text{kg/cm}^2$
  - 14) Design life= $20$  years
  - 15) Wheel Load= $8000\text{kg}$
  - 16) Joint width= $2.0\text{cm}$
  - 17) Assume trial thickness= $19\text{cm}$

Note: Check for temperature stress at edge and Corner is not necessary  
The axle load spectrum obtained from axle load survey and stress ratio with allowable repetitions are given in **Table-1** and **2** respectively.

**Table-1** - Axle Load Survey Data with Stress from chart

Single Axle Loads			Tandem Axle Loads		
Axle Load class, tons	Percentage of axle loads	Stress, $\text{kg/cm}^2$	Axle Load class, tons	Percentage of axle loads	Stress, $\text{kg/cm}^2$
19-21	0.6	42.30	34-38	0.3	30.24
17-19	1.5	39.0	30-34	0.3	-
15-17	4.8	35.50	26-30	0.6	-
13-15	10.8	33.80	22-26	1.8	-
11-13	22	-	18-22	1.5	-
9-11	23.3	-	14-18	0.5	-
< 9	30.0	-	<14	2.0	-

**Table-2** - Stress Ratio and Allowable Repetition in CC Pavement

Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions
0.45	$6.279 \times 10^7$	0.66	$5.83 \times 10^3$	0.55	$1.24 \times 10^4$	0.76	361
0.46	$1.4335 \times 10^8$	0.67	$4.41 \times 10^3$	0.56	$9.41 \times 10^3$	0.77	274
0.47	$5.2 \times 10^6$	0.68	$3.34 \times 10^3$	0.57	$7.12 \times 10^3$	0.78	207
0.48	$2.4 \times 10^6$	0.69	2531	0.58	$5.4 \times 10^3$	0.79	157
0.49	$1.287 \times 10^6$	0.70	1970	0.59	$4.08 \times 10^3$	0.80	119
0.50	$7.62 \times 10^5$	0.71	1451	0.60	$3.09 \times 10^3$	0.81	90
0.51	$4.85 \times 10^5$	0.72	1099	0.61	$2.34 \times 10^3$	0.82	68
0.52	$3.26 \times 10^5$	0.73	832	0.62	$1.77 \times 10^3$	0.83	52
0.53	$2.29 \times 10^5$	0.74	630	0.63	$1.34 \times 10^3$	0.84	39
0.54	$1.66 \times 10^5$	0.75	477	0.64	$1.02 \times 10^3$	0.85	30
				0.65	$7.7 \times 10^2$		

c) Design a Dowel bar as per IRC-58-2015 using given data below:

- 1) Slab thickness,  $h = 300$  mm
- 2) Joint width,  $z = 20$  mm
- 3) Modulus of subgrade reaction,  $k = 80$  MPa/m
- 4) Radius of relative stiffness,  $l = 1035.3$  mm
- 5)  $E$  for dowel bar  $= 2 \times 10^5$  MPa
- 6) Modulus of dowel support,  $k_{mds} = 415000$  MPa/m
- 7) Wheel load for dowel bar design  $= 80$  kN
- 8) Load Transfer  $= 40\%$
- 9) Characteristics compressive Strength of Concrete,  $f_{ck} = 40$  MPa for M40 grade
- 10) Assume Diameter of Dowel bar  $= 38$  mm, Length  $= 500$  mm & spacing  $= 300$  mm
- 11) First dowel bar is placed at a distance of 150 mm from the pavement edge

**Q.7 Answer any three questions**

**18**

a) Design a Tie bar as per IRC-58-2015 using given data below:

- 1) Slab Thickness  $= 0.33$  m
- 2) Lane width,  $b = 3.5$  m
- 3) Coefficient of friction,  $f = 1.5$
- 4) Density of concrete,  $kN/m^3 = 24$
- 5) Allowable tensile stress in plain bars, MPa  $= 125$
- 6) Allowable bond stress for plain tie bars, MPa  $= 1.75$
- 7) Allowable bond stress for deformed tie bars, MPa  $= 2.46$
- 8) Assume Diameter of Tie bar  $= 12$  mm
- 9) Design Tie bar at plain bars

b) Write a short note on any two:

- 1) Factors effecting flexible pavement design
- 2) Layered systems concepts of Pavement Design
- 3) Factors effecting Rigid Pavement Design
- 4) Principles of Rigid Pavement Design as per IRC-58-2015

- c) The BBD studies conducted on a two-lane existing pavement. Design the overlay thickness as per IRC-81 using the data given below: Use **Figure-IV** for overlay thickness.

- 1) Consider moisture correction factor seasonal correction factor= 1.04
- 2) Cumulative number of standard axles=100msa

Table-3-BBD Survey Data:

Chainage	17	17.05	17.1	17.15	17.2	17.25	17.3	17.35
Rebound Deflection, mm	0.84	0.83	0.32	1.57	0.52	0.44	0.43	0.67
Pavement Temperature, °C	37	37	37	37	37	37	37	37

- d) Explain how warping stresses are formed in C.C. pavements. Describe the Westergaard's equations to calculate warping stresses at critical locations.

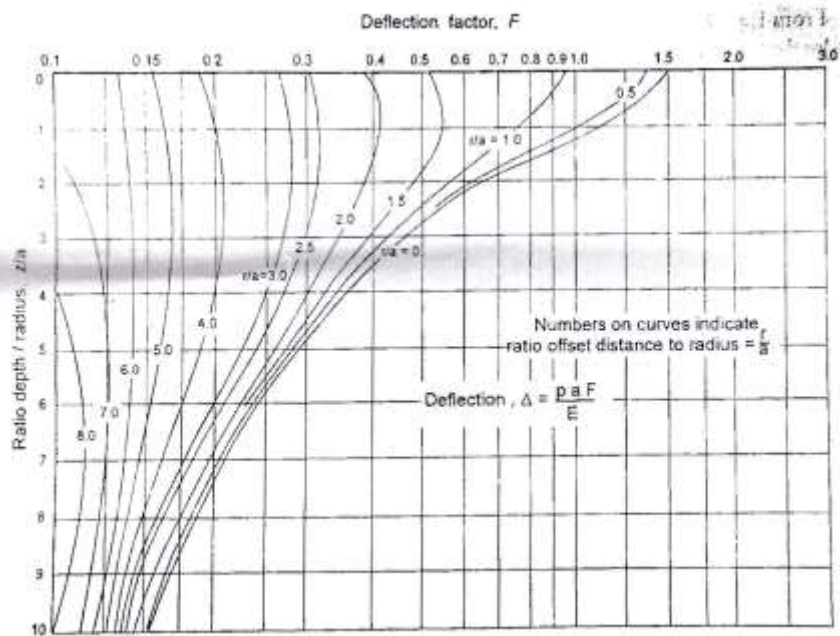


Figure-I-Deflection Factor Chart (Single Layer)

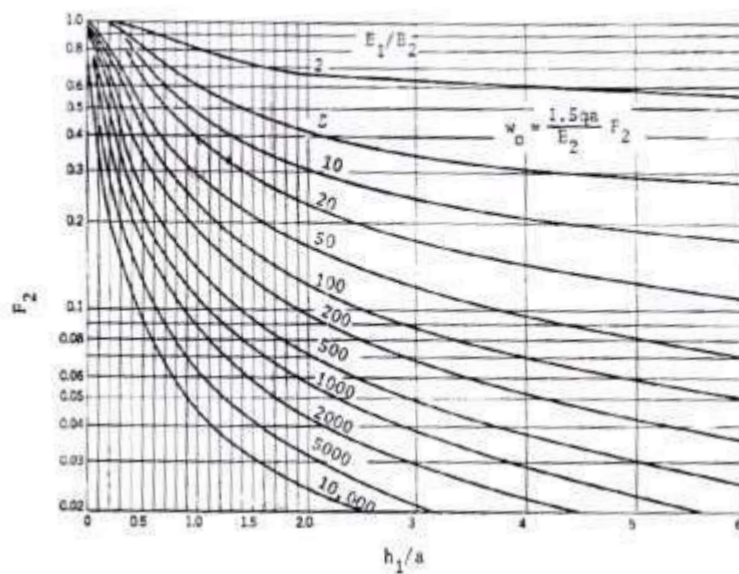


Figure-II-Burmister two-layer deflection chart

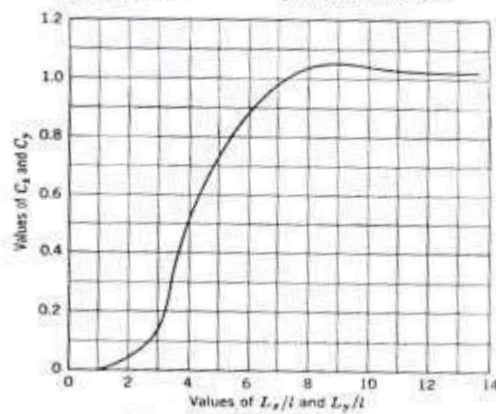
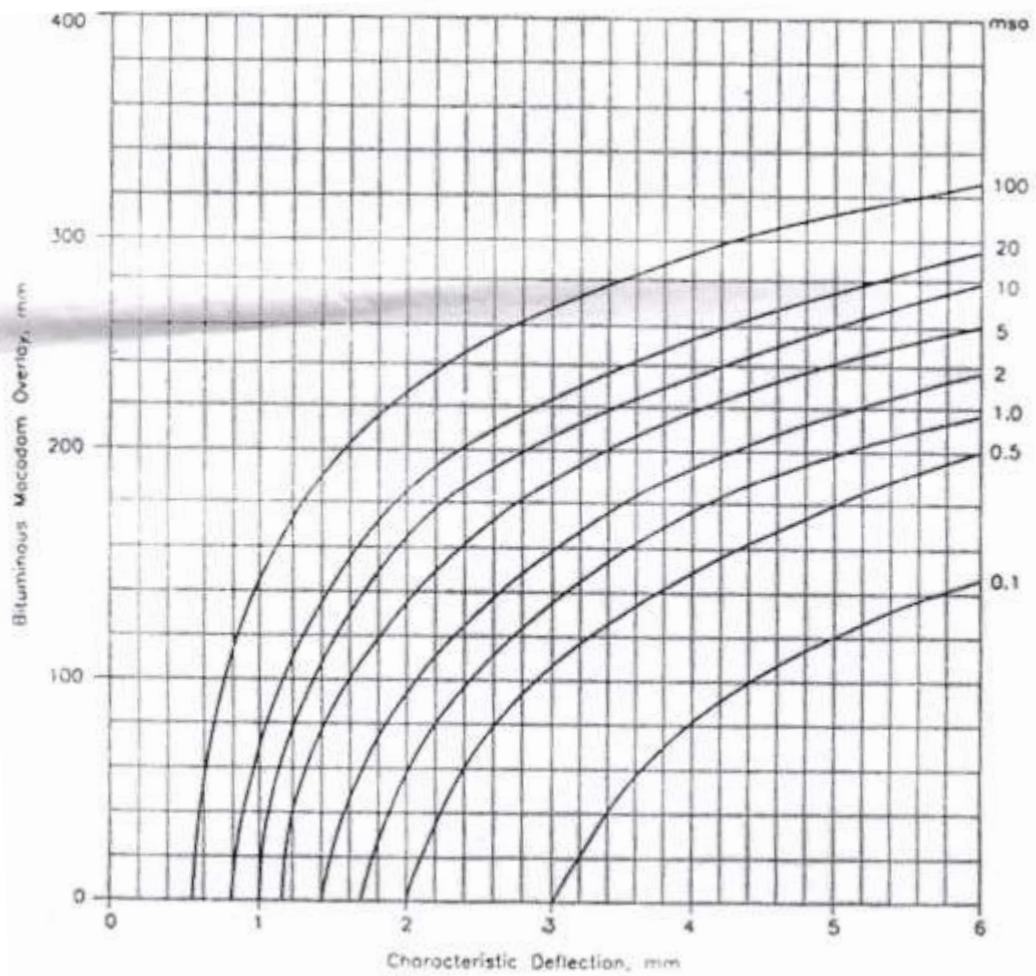


Figure-III-Bradbury Chart

**Figure-IV-Overlay Thickness Curves**



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T. Y. (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Pavement Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Identify the correct order of concrete pavement layers in correct order from bottom to top.
  - a) GSB, Subgrade, DEC, PQC and 125-micron Polyethylene sheet
  - b) 125-micron Polyethylene sheet, GSB, Subgrade, DLC and PQC
  - c) DLC, PQC, 125-micron Polyethylene sheet, GSB and Subgrade
  - d) Subgrade, GSB, DLC, 125-micron Polyethylene sheet and PQC
- 2) The standard wheel load considered for the design of flexible pavement using IIT PAVE software is: \_\_\_\_\_.
  - a) 10 kN on each single wheel
  - b) 20 kN on each single wheel
  - c) 30 kN on each single wheel
  - d) 40 kN on each single wheel
- 3) Arrange the correct sequence of design steps of flexible pavement design using IRC-37-2018.
  - 1) Select a trial thickness
  - 2) Actual strains using IIT PAVE
  - 3) Calculation of Allowable strains
  - 4) Calculation of resilient modulus of all materials
  - 5) Comparison of Actual strains and allowable strains
  - a) 1, 2, 3, 4, 5
  - b) 5, 4, 2, 3, 1
  - c) 1, 4, 3, 2, 5
  - d) 4, 1, 5, 3, 2
- 4) In flexible pavement, the CTB and CTSB layers are designed based on \_\_\_\_\_.
  - a) CBR Value of material
  - b) Modulus of subgrade reaction
  - c) Flexural strength
  - d) Unconfined Compressive strength
- 5) The main purpose of the Dry Lean Concrete (DLC) layer in rigid pavement is to \_\_\_\_\_.
  - a) Provide good bond between two layers
  - b) Provide a good riding surface
  - c) Provide a effective drainage of pavement system
  - d) Provide a uniform, stable and permanent support to the concrete slab laid over it

- Page 12 of 40

- 12)** The vehicle carries a rear single axle weight of 16 tonnes, what is the EWLF? (Use fourth power rule and considerer standard axle weight as 8.16 tonne)
- |          |          |
|----------|----------|
| a) 15.78 | b) 14.78 |
| c) 13.78 | d) 12.78 |
- 13)** The transverse distribution of heavy vehicles across the width of the carriageway is called \_\_\_\_\_.
- |  |
|--|
| a) Equivalent wheel load factor        |
| b) Lane Distribution Factor            |
| c) Vehicle Damage Factor               |
| d) Equivalent Single Wheel Load Factor |
- 14)** In rigid pavement, when the width of the slab exceeds 4.5 to 5.0m, the type of joint required is?
- |                      |                       |
|----------------------|-----------------------|
| a) Contraction joint | b) Construction joint |
| c) Expansion joint   | d) Longitudinal joint |

Seat No.	
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Set Q
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**T. Y. (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Pavement Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I, Q. No. 2 is compulsory. Solve any one full question from remaining question no. 3 and 4  
 2) In Section – II, Q. No. 5 is compulsory. Solve any one full question from remaining question no. 6 and 7  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions** **10**

- a) Draw a neat sketch of flexible pavement and show component parts of all layers. Briefly explain function of all layers.
- b) Explain ESWL. Briefly explain the graphical method of determination of ESWL.
- c) What is VDF? Determine the Equivalent Wheel Load Factor or VDF value of the following two axle loads in terms of the standard axle load of 8.16 tonne.
  - 1) LCV with rear axle load of 2.0t
  - 2) HCV with rear axle load of 15.5t

**Q.3 Answer any two questions** **18**

- a) A flexible pavement of thickness 48cm is laid over a subgrade. A circular load of 16cm with uniform contact pressure  $6.5\text{kg/cm}^2$  is applied. Assume the elastic modulus of the subgrade as well as pavement layer to be  $900\text{kg/cm}^2$ . Use Deflection Factor chart given in **Fig-I**. Assuming homogenous elastic single layer system determine.
  - 1) The deflection of the pavement surface under the center of the load
  - 2) The total thickness of flexible pavement using data Design Wheel Load=5000kg, Tyre pressure= $6.0\text{kg/cm}^2$ , Elastic modulus= $150\text{kg/cm}^2$  and permissible deflection= $0.25\text{cm}$
- b) If the CBR of the soil used in the upper 500 mm of embankment is 8% and the CBR of the borrow soil used for preparing the 500 mm thick compacted subgrade above embankment is 20%, what is the effective subgrade Modulus/CBR for design of flexible pavement? Consider Poisson's ratio=0.35. Use surface deflection,  $\delta=1.41\text{mm}$  from IIT PAVE software. Draw a neat sketch of equivalent subgrade system diagram.
- c) Design a bituminous pavement as per IRC-37-2018 with Granular Base and Sub-base layers using the following input data.
  - 1) Four lane divided carriageway
  - 2) Initial traffic in the year of completion of construction = 5000 cvpd (two-way)
  - 3) Traffic growth rate per annum = 6.0 per cent
  - 4) Design life period = 20 years
  - 5) Vehicle damage factor = 5.2

- 6) Effective CBR of subgrade estimated = 7 %
- 7) Marshall mix design carried out on the bituminous mix to be used in the bottom bituminous layer (DBM) for an air void content of 3 % resulted in an effective bitumen content (by volume) of 11.5 %
- 8) Lane Distribution Factor=0.75
- 9) Computed horizontal tensile strain using IIT PAVE software = 0.000146.
- 10) Computed vertical compressive strain using IIT PAVE software = 0.000243
- 11) Consider VG-40 grade bitumen with resilient modulus of 3000 Mpa
- 12) Poisson's ratio=0.35

Assume trial thickness as below: BC-40mm, DBM-150mm, WMM-250mm and GSB- 230mm.

**Q.4 Answer any three questions**

**18**

- a) Draw a neat sketch of rigid pavement and show component parts of all layers. Briefly explain function of all layers.
- b) With sketch describe the significance of design wheel load and contact pressure in design of pavement.
- c) Find ESWT at depths of 50mm, 200mm and 400mm for a dual wheel carrying 2044 kN each. The centre-to-centre tyre spacing is 200mm and distance between the walls of the two tyres is 100 mm. Use (log) equation to calculate ESWL.
- d) Plate bearing tests were conducted using 30cm diameter plate on soil subgrade and over a base course of thickness 45cm. The pressure yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm<sup>2</sup> and 8kg/cm<sup>2</sup> respectively. Design the thickness requirement of flexible pavement for a wheel load of 5100kg with tyre pressure of 8.0kg/cm<sup>2</sup> for an allowable deflection of 0.5cm using Burmister two-layer deflection factor chart shown in **Fig-II**.

**Section – II**

**Q.5 Answer any two questions**

**10**

- a) What is the objective of providing dowel bars and tie bars in rigid pavement?
- b) With a diagram explain the working principle of Benkelman beam for measurement of pavement deflection.
- c) C.C. Pavement is constructed using the following data:
  - 1) Modulus of elasticity  $3.3 \times 10^5$  kg/cm<sup>2</sup>
  - 2) Poisson's ratio=0.15
  - 3) Thickness of CC pavement = 18 cm
  - 4) Modulus of subgrade reaction-25kg/cm<sup>3</sup>
  - 5) Wheel load = 4100 kg
  - 6) Radius of loaded area = 12 cm
 Calculate stresses at Interior, Edge and corner by Westergaard's method.

**Q.6 Answer any two questions**

- a) Determine the warping stresses at interior, edge and corner of a 25cm thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction  $K$  is  $6.9\text{kg/cm}^3$  and radius of loaded area is 15cm. Assume temperature differential during day to be  $0.6^\circ\text{C}$  per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of  $0.4^\circ\text{C}$  per cm slab thickness during the night (for warping stress at the corner). Assume  $e=10 \times 10^{-6}\text{per}^\circ\text{C}$ ,  $E=3 \times 10^5 \text{ kg/cm}^2$ ,  $\mu=0.15$ . Use Bradbury chart given in **Figure-III**.
- b) Design the thickness cement concrete pavement as per IRC-58-2002 for a two-lane two-way National Highway in Gujarat State. The total two-way traffic is 3000 commercial vehicles per day at the end of the construction period. The design parameters are:
- 1) Flexural strength of Concrete= $81.5\text{kg/cm}^2$
  - 2) Effective Modulus of subgrade reaction of the DLC= $24.25\text{kg/cm}^3$
  - 3) Elastic modulus of concrete= $40417\text{kg/cm}^2$
  - 4) Poisson's ratio= $0.15$
  - 5) CBR of subgrade soil= $6.0\%$
  - 6) Coefficient of thermal coefficient= $10 \times 10^{-6}/^\circ\text{C}$
  - 7) Rate of traffic increase= $0.075$
  - 8) Spacing of contraction joints= $4.5\text{m}$
  - 9) Width of slab= $3.5\text{m}$
  - 10) Load Safety Factor= $1.2$
  - 11) Assume Trial Thickness= $33\text{cm}$
  - 12) The temperature differential= $21^\circ\text{C}$
  - 13) Tyre Pressure= $8\text{kg/cm}^2$
  - 14) Design life= $20$  years
  - 15) Wheel Load= $8000\text{kg}$
  - 16) Joint width= $2.0\text{cm}$
  - 17) Assume trial thickness= $19\text{cm}$

Note: Check for temperature stress at edge and Corner is not necessary  
The axle load spectrum obtained from axle load survey and stress ratio with allowable repetitions are given in **Table-1** and **2** respectively.

**Table-1** - Axle Load Survey Data with Stress from chart

Single Axle Loads			Tandem Axle Loads		
Axle Load class, tons	Percentage of axle loads	Stress, $\text{kg/cm}^2$	Axle Load class, tons	Percentage of axle loads	Stress, $\text{kg/cm}^2$
19-21	0.6	42.30	34-38	0.3	30.24
17-19	1.5	39.0	30-34	0.3	-
15-17	4.8	35.50	26-30	0.6	-
13-15	10.8	33.80	22-26	1.8	-
11-13	22	-	18-22	1.5	-
9-11	23.3	-	14-18	0.5	-
< 9	30.0	-	<14	2.0	-

**Table-2** - Stress Ratio and Allowable Repetition in CC Pavement

Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions
0.45	$6.279 \times 10^7$	0.66	$5.83 \times 10^3$	0.55	$1.24 \times 10^4$	0.76	361
0.46	$1.4335 \times 10^8$	0.67	$4.41 \times 10^3$	0.56	$9.41 \times 10^4$	0.77	274
0.47	$5.2 \times 10^6$	0.68	$3.34 \times 10^3$	0.57	$7.12 \times 10^4$	0.78	207
0.48	$2.4 \times 10^6$	0.69	2531	0.58	$5.4 \times 10^4$	0.79	157
0.49	$1.287 \times 10^6$	0.70	1970	0.59	$4.08 \times 10^4$	0.80	119
0.50	$7.62 \times 10^5$	0.71	1451	0.60	$3.09 \times 10^4$	0.81	90
0.51	$4.85 \times 10^5$	0.72	1099	0.61	$2.34 \times 10^4$	0.82	68
0.52	$3.26 \times 10^5$	0.73	832	0.62	$1.77 \times 10^4$	0.83	52
0.53	$2.29 \times 10^5$	0.74	630	0.63	$1.34 \times 10^4$	0.84	39
0.54	$1.66 \times 10^5$	0.75	477	0.64	$1.02 \times 10^4$	0.85	30
				0.65	$7.7 \times 10^3$		

c) Design a Dowel bar as per IRC-58-2015 using given data below:

- 1) Slab thickness,  $h = 300$  mm
- 2) Joint width,  $z = 20$  mm
- 3) Modulus of subgrade reaction,  $k = 80$  MPa/m
- 4) Radius of relative stiffness,  $l = 1035.3$  mm
- 5)  $E$  for dowel bar  $= 2 \times 10^5$  MPa
- 6) Modulus of dowel support,  $k_{mds} = 415000$  MPa/m
- 7) Wheel load for dowel bar design  $= 80$  kN
- 8) Load Transfer  $= 40\%$
- 9) Characteristics compressive Strength of Concrete,  $f_{ck} = 40$  MPa for M40 grade
- 10) Assume Diameter of Dowel bar  $= 38$  mm, Length  $= 500$  mm & spacing  $= 300$  mm
- 11) First dowel bar is placed at a distance of 150 mm from the pavement edge

#### Q.7 Answer any three questions

18

a) Design a Tie bar as per IRC-58-2015 using given data below:

- 1) Slab Thickness  $= 0.33$  m
- 2) Lane width,  $b = 3.5$  m
- 3) Coefficient of friction,  $f = 1.5$
- 4) Density of concrete,  $kN/m^3 = 24$
- 5) Allowable tensile stress in plain bars, MPa  $= 125$
- 6) Allowable bond stress for plain tie bars, MPa  $= 1.75$
- 7) Allowable bond stress for deformed tie bars, MPa  $= 2.46$
- 8) Assume Diameter of Tie bar  $= 12$  mm
- 9) Design Tie bar at plain bars

b) Write a short note on any two:

- 1) Factors effecting flexible pavement design
- 2) Layered systems concepts of Pavement Design
- 3) Factors effecting Rigid Pavement Design
- 4) Principles of Rigid Pavement Design as per IRC-58-2015

- c) The BBD studies conducted on a two-lane existing pavement. Design the overlay thickness as per IRC-81 using the data given below: Use **Figure-IV** for overlay thickness.

- 1) Consider moisture correction factor seasonal correction factor= 1.04
- 2) Cumulative number of standard axles=100msa

Table-3-BBD Survey Data:

Chainage	17	17.05	17.1	17.15	17.2	17.25	17.3	17.35
Rebound Deflection, mm	0.84	0.83	0.32	1.57	0.52	0.44	0.43	0.67
Pavement Temperature, °C	37	37	37	37	37	37	37	37

- d) Explain how warping stresses are formed in C.C. pavements. Describe the Westergaard's equations to calculate warping stresses at critical locations.

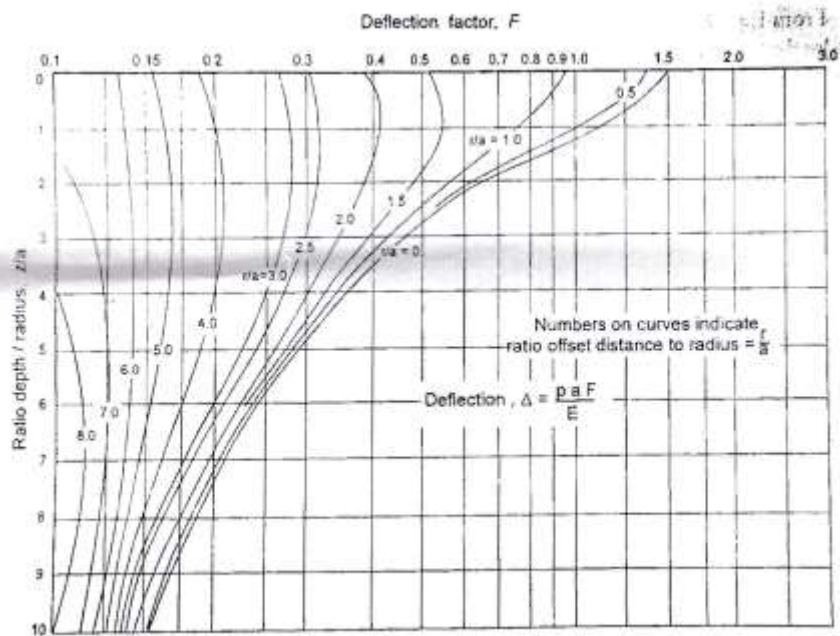


Figure-I-Deflection Factor Chart (Single Layer)



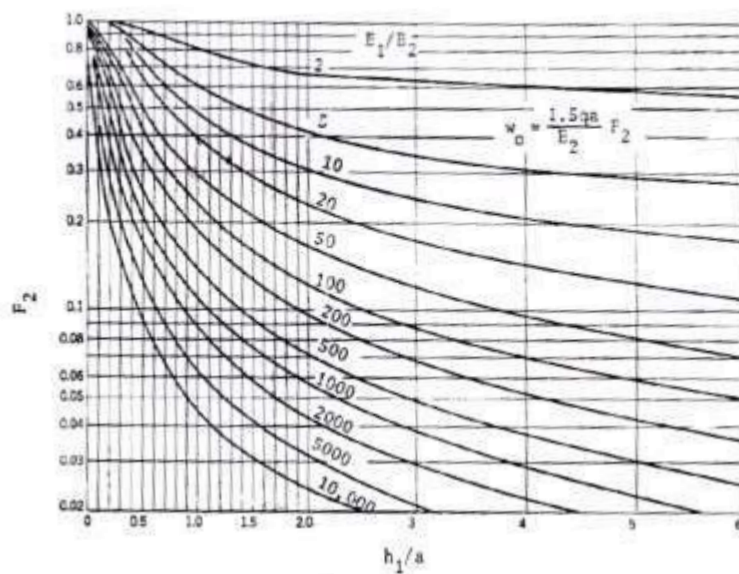


Figure-II-Burmister two-layer deflection chart

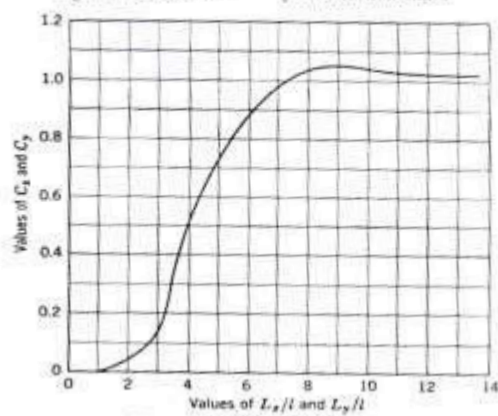
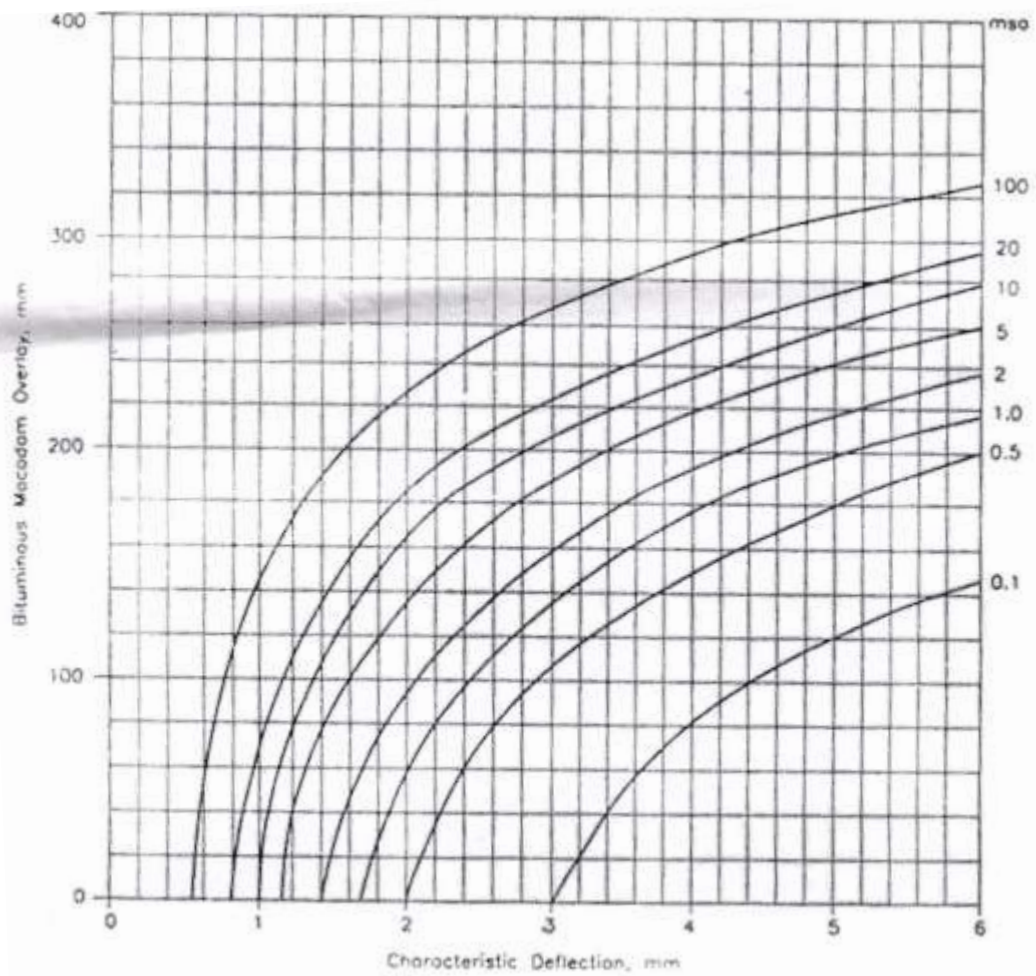


Figure-III-Bradbury Chart

**Figure-IV-Overlay Thickness Curves**

Seat No.	
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Set R
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**T. Y. (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Pavement Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) In flexible pavement, the CTB and CTSB layers are designed based on \_\_\_\_\_.  
 a) CBR Value of material                      b) Modulus of subgrade reaction  
 c) Flexural strength                              d) Unconfined Compressive strength
- 2) The main purpose of the Dry Lean Concrete (DLC) layer in rigid pavement is to \_\_\_\_\_.  
 a) Provide good bond between two layers  
 b) Provide a good riding surface  
 c) Provide a effective drainage of pavement system  
 d) Provide a uniform, stable and permanent support to the concrete slab laid over it
- 3) As per IS-456-2000, the flexural strength can be calculated using the below equation: ( $F_{cr}$  - Flexural strength of concrete &  $f_{ck}$  - characteristic compressive strength of concrete)  
 a)  $F_{cr} = 0.7\sqrt{f_{ck}}$                                       b)  $F_{cr} = 0.78\sqrt{f_{ck}}$   
 c)  $F_{cr} = 0.75\sqrt{f_{ck}}$                                       d)  $F_{cr} = 0.8\sqrt{f_{ck}}$
- 4) The dowel bars are designed based on \_\_\_\_\_.  
 a) Yield stress of dowel bars  
 b) Bearing stress of dowel bars  
 c) Tensile strength of dowel bars  
 d) Allowable working stress in dowel bar
- 5) Identify the correct order of construction of flexible pavement from top to bottom.  
 1) Subgrade  
 2) Prime Coat  
 3) Tack Coat  
 4) Dense Bituminous Macadam  
 5) Bituminous Concrete  
 6) Wet Mix Macadam  
 7) Granular Subbase

a) 1,2,3,4,5,6,7                      b) 1,7,6,2,4,3 and 5  
c) 1,6,7,3,5,2 and 4                d) 5,3,4,2,6,7 and 1

- 13)** The standard wheel load considered for the design of flexible pavement using IIT PAVE software is: \_\_\_\_\_.  
a) 10 kN on each single wheel      b) 20 kN on each single wheel  
c) 30 kN on each single wheel      d) 40 kN on each single wheel
- 14)** Arrange the correct sequence of design steps of flexible pavement design using IRC-37-2018.  
1) Select a trial thickness  
2) Actual strains using IIT PAVE  
3) Calculation of Allowable strains  
4) Calculation of resilient modulus of all materials  
5) Comparison of Actual strains and allowable strains  
a) 1, 2, 3, 4, 5      b) 5, 4, 2, 3, 1  
c) 1, 4, 3, 2, 5      d) 4, 1, 5, 3, 2

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**T. Y. (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Pavement Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I, Q. No. 2 is compulsory. Solve any one full question from remaining question no. 3 and 4  
 2) In Section – II, Q. No. 5 is compulsory. Solve any one full question from remaining question no. 6 and 7  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions** **10**

- Draw a neat sketch of flexible pavement and show component parts of all layers. Briefly explain function of all layers.
- Explain ESWL. Briefly explain the graphical method of determination of ESWL.
- What is VDF? Determine the Equivalent Wheel Load Factor or VDF value of the following two axle loads in terms of the standard axle load of 8.16 tonne.
  - LCV with rear axle load of 2.0t
  - HCV with rear axle load of 15.5t

**Q.3 Answer any two questions** **18**

- A flexible pavement of thickness 48cm is laid over a subgrade. A circular load of 16cm with uniform contact pressure  $6.5\text{kg/cm}^2$  is applied. Assume the elastic modulus of the subgrade as well as pavement layer to be  $900\text{kg/cm}^2$ . Use Deflection Factor chart given in **Fig-I**. Assuming homogenous elastic single layer system determine.
  - The deflection of the pavement surface under the center of the load
  - The total thickness of flexible pavement using data Design Wheel Load=5000kg, Tyre pressure= $6.0\text{kg/cm}^2$ , Elastic modulus= $150\text{kg/cm}^2$  and permissible deflection=0.25cm
- If the CBR of the soil used in the upper 500 mm of embankment is 8% and the CBR of the borrow soil used for preparing the 500 mm thick compacted subgrade above embankment is 20%, what is the effective subgrade Modulus/CBR for design of flexible pavement? Consider Poisson's ratio=0.35. Use surface deflection,  $\delta=1.41\text{mm}$  from IIT PAVE software. Draw a neat sketch of equivalent subgrade system diagram.
- Design a bituminous pavement as per IRC-37-2018 with Granular Base and Sub-base layers using the following input data.
  - Four lane divided carriageway
  - Initial traffic in the year of completion of construction = 5000 cvpd (two-way)
  - Traffic growth rate per annum = 6.0 per cent
  - Design life period = 20 years
  - Vehicle damage factor = 5.2

- 6) Effective CBR of subgrade estimated = 7 %
- 7) Marshall mix design carried out on the bituminous mix to be used in the bottom bituminous layer (DBM) for an air void content of 3 % resulted in an effective bitumen content (by volume) of 11.5 %
- 8) Lane Distribution Factor=0.75
- 9) Computed horizontal tensile strain using IIT PAVE software = 0.000146.
- 10) Computed vertical compressive strain using IIT PAVE software = 0.000243
- 11) Consider VG-40 grade bitumen with resilient modulus of 3000 Mpa
- 12) Poisson's ratio=0.35

Assume trial thickness as below: BC-40mm, DBM-150mm, WMM-250mm and GSB- 230mm.

**Q.4 Answer any three questions****18**

- a) Draw a neat sketch of rigid pavement and show component parts of all layers. Briefly explain function of all layers.
- b) With sketch describe the significance of design wheel load and contact pressure in design of pavement.
- c) Find ESWT at depths of 50mm, 200mm and 400mm for a dual wheel carrying 2044 kN each. The centre-to-centre tyre spacing is 200mm and distance between the walls of the two tyres is 100 mm. Use (log) equation to calculate ESWL.
- d) Plate bearing tests were conducted using 30cm diameter plate on soil subgrade and over a base course of thickness 45cm. The pressure yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm<sup>2</sup> and 8kg/cm<sup>2</sup> respectively. Design the thickness requirement of flexible pavement for a wheel load of 5100kg with tyre pressure of 8.0kg/cm<sup>2</sup> for an allowable deflection of 0.5cm using Burmister two-layer deflection factor chart shown in **Fig-II**.

**Section – II****Q.5 Answer any two questions****10**

- a) What is the objective of providing dowel bars and tie bars in rigid pavement?
- b) With a diagram explain the working principle of Benkelman beam for measurement of pavement deflection.
- c) C.C. Pavement is constructed using the following data:
  - 1) Modulus of elasticity  $3.3 \times 10^5$  kg/cm<sup>2</sup>
  - 2) Poisson's ratio=0.15
  - 3) Thickness of CC pavement = 18 cm
  - 4) Modulus of subgrade reaction-25kg/cm<sup>3</sup>
  - 5) Wheel load = 4100 kg
  - 6) Radius of loaded area = 12 cm
 Calculate stresses at Interior, Edge and corner by Westergaard's method.

**Q.6 Answer any two questions**

- a) Determine the warping stresses at interior, edge and corner of a 25cm thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction  $K$  is  $6.9\text{kg/cm}^3$  and radius of loaded area is 15cm. Assume temperature differential during day to be  $0.6^\circ\text{C}$  per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of  $0.4^\circ\text{C}$  per cm slab thickness during the night (for warping stress at the corner). Assume  $e=10 \times 10^{-6}\text{per}^\circ\text{C}$ ,  $E=3 \times 10^5 \text{ kg/cm}^2$ ,  $\mu=0.15$ . Use Bradbury chart given in **Figure-III**.
- b) Design the thickness cement concrete pavement as per IRC-58-2002 for a two-lane two-way National Highway in Gujarat State. The total two-way traffic is 3000 commercial vehicles per day at the end of the construction period. The design parameters are:
- 1) Flexural strength of Concrete= $81.5\text{kg/cm}^2$
  - 2) Effective Modulus of subgrade reaction of the DLC= $24.25\text{kg/cm}^3$
  - 3) Elastic modulus of concrete= $40417\text{kg/cm}^2$
  - 4) Poisson's ratio= $0.15$
  - 5) CBR of subgrade soil= $6.0\%$
  - 6) Coefficient of thermal coefficient= $10 \times 10^{-6}/^\circ\text{C}$
  - 7) Rate of traffic increase= $0.075$
  - 8) Spacing of contraction joints= $4.5\text{m}$
  - 9) Width of slab= $3.5\text{m}$
  - 10) Load Safety Factor= $1.2$
  - 11) Assume Trial Thickness= $33\text{cm}$
  - 12) The temperature differential= $21^\circ\text{C}$
  - 13) Tyre Pressure= $8\text{kg/cm}^2$
  - 14) Design life= $20$  years
  - 15) Wheel Load= $8000\text{kg}$
  - 16) Joint width= $2.0\text{cm}$
  - 17) Assume trial thickness= $19\text{cm}$

Note: Check for temperature stress at edge and Corner is not necessary  
The axle load spectrum obtained from axle load survey and stress ratio with allowable repetitions are given in **Table-1** and **2** respectively.

**Table-1** - Axle Load Survey Data with Stress from chart

Single Axle Loads			Tandem Axle Loads		
Axle Load class, tons	Percentage of axle loads	Stress, $\text{kg/cm}^2$	Axle Load class, tons	Percentage of axle loads	Stress, $\text{kg/cm}^2$
19-21	0.6	42.30	34-38	0.3	30.24
17-19	1.5	39.0	30-34	0.3	-
15-17	4.8	35.50	26-30	0.6	-
13-15	10.8	33.80	22-26	1.8	-
11-13	22	-	18-22	1.5	-
9-11	23.3	-	14-18	0.5	-
< 9	30.0	-	<14	2.0	-



**Table-2** - Stress Ratio and Allowable Repetition in CC Pavement

Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions
0.45	$6.279 \times 10^7$	0.66	$5.83 \times 10^3$	0.55	$1.24 \times 10^4$	0.76	361
0.46	$1.4335 \times 10^8$	0.67	$4.41 \times 10^3$	0.56	$9.41 \times 10^3$	0.77	274
0.47	$5.2 \times 10^6$	0.68	$3.34 \times 10^3$	0.57	$7.12 \times 10^3$	0.78	207
0.48	$2.4 \times 10^6$	0.69	2531	0.58	$5.4 \times 10^3$	0.79	157
0.49	$1.287 \times 10^6$	0.70	1970	0.59	$4.08 \times 10^3$	0.80	119
0.50	$7.62 \times 10^5$	0.71	1451	0.60	$3.09 \times 10^3$	0.81	90
0.51	$4.85 \times 10^5$	0.72	1099	0.61	$2.34 \times 10^3$	0.82	68
0.52	$3.26 \times 10^5$	0.73	832	0.62	$1.77 \times 10^3$	0.83	52
0.53	$2.29 \times 10^5$	0.74	630	0.63	$1.34 \times 10^3$	0.84	39
0.54	$1.66 \times 10^5$	0.75	477	0.64	$1.02 \times 10^3$	0.85	30
				0.65	$7.7 \times 10^2$		

c) Design a Dowel bar as per IRC-58-2015 using given data below:

- 1) Slab thickness,  $h = 300$  mm
- 2) Joint width,  $z = 20$  mm
- 3) Modulus of subgrade reaction,  $k = 80$  MPa/m
- 4) Radius of relative stiffness,  $l = 1035.3$  mm
- 5)  $E$  for dowel bar  $= 2 \times 10^5$  MPa
- 6) Modulus of dowel support,  $k_{mds} = 415000$  MPa/m
- 7) Wheel load for dowel bar design  $= 80$  kN
- 8) Load Transfer  $= 40\%$
- 9) Characteristics compressive Strength of Concrete,  $f_{ck} = 40$  MPa for M40 grade
- 10) Assume Diameter of Dowel bar  $= 38$  mm, Length  $= 500$  mm & spacing  $= 300$  mm
- 11) First dowel bar is placed at a distance of 150 mm from the pavement edge

#### Q.7 Answer any three questions

18

a) Design a Tie bar as per IRC-58-2015 using given data below:

- 1) Slab Thickness  $= 0.33$  m
- 2) Lane width,  $b = 3.5$  m
- 3) Coefficient of friction,  $f = 1.5$
- 4) Density of concrete,  $kN/m^3 = 24$
- 5) Allowable tensile stress in plain bars, MPa  $= 125$
- 6) Allowable bond stress for plain tie bars, MPa  $= 1.75$
- 7) Allowable bond stress for deformed tie bars, MPa  $= 2.46$
- 8) Assume Diameter of Tie bar  $= 12$  mm
- 9) Design Tie bar at plain bars

b) Write a short note on any two:

- 1) Factors effecting flexible pavement design
- 2) Layered systems concepts of Pavement Design
- 3) Factors effecting Rigid Pavement Design
- 4) Principles of Rigid Pavement Design as per IRC-58-2015

- c) The BBD studies conducted on a two-lane existing pavement. Design the overlay thickness as per IRC-81 using the data given below: Use **Figure-IV** for overlay thickness.

- 1) Consider moisture correction factor seasonal correction factor= 1.04
- 2) Cumulative number of standard axles=100msa

Table-3-BBD Survey Data:

Chainage	17	17.05	17.1	17.15	17.2	17.25	17.3	17.35
Rebound Deflection, mm	0.84	0.83	0.32	1.57	0.52	0.44	0.43	0.67
Pavement Temperature, °C	37	37	37	37	37	37	37	37

- d) Explain how warping stresses are formed in C.C. pavements. Describe the Westergaard's equations to calculate warping stresses at critical locations.

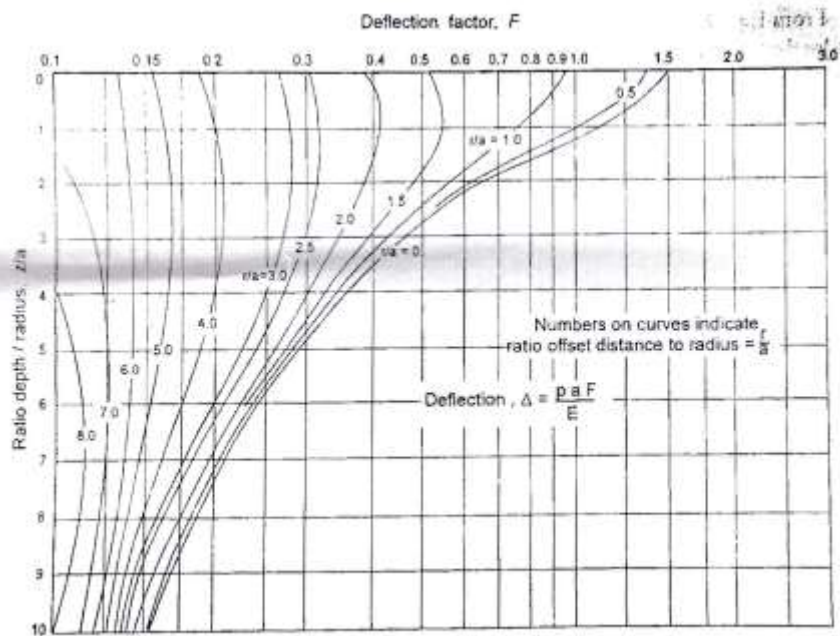


Figure-I-Deflection Factor Chart (Single Layer)

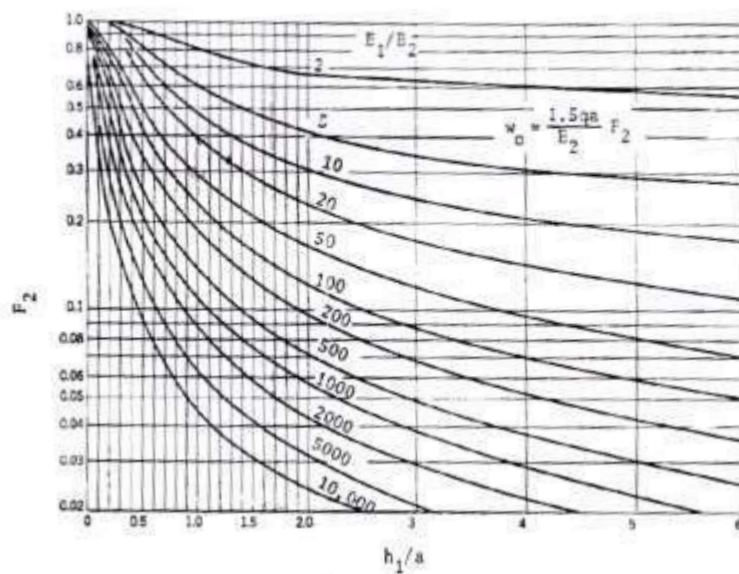


Figure-II-Burmister two-layer deflection chart

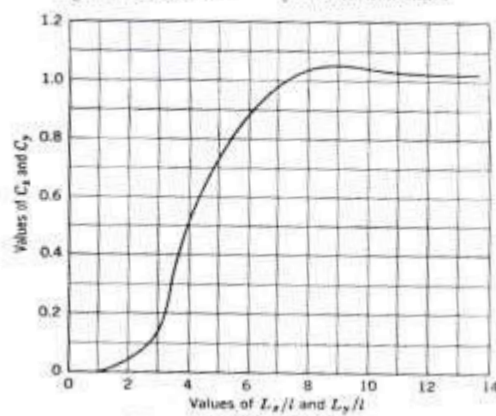
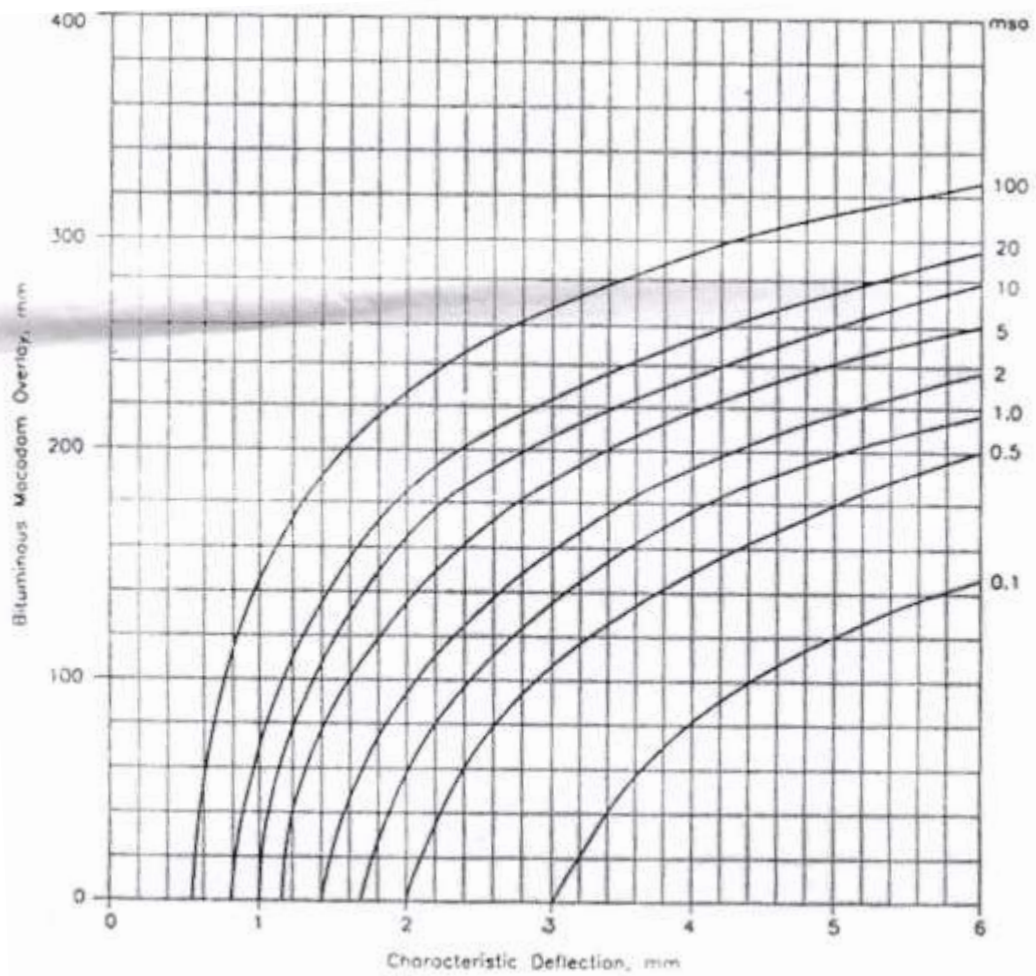


Figure-III-Bradbury Chart

**Figure-IV-Overlay Thickness Curves**

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**T. Y. (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Pavement Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The transverse distribution of heavy vehicles across the width of the carriageway is called \_\_\_\_\_.  
 a) Equivalent wheel load factor  
 b) Lane Distribution Factor  
 c) Vehicle Damage Factor  
 d) Equivalent Single Wheel Load Factor
- 2) In rigid pavement, when the width of the slab exceeds 4.5 to 5.0m, the type of joint required is?  
 a) Contraction joint  
 b) Construction joint  
 c) Expansion joint  
 d) Longitudinal joint
- 3) Identify the correct order of concrete pavement layers in correct order from bottom to top.  
 a) GSB, Subgrade, DEC, PQC and 125-micron Polyethylene sheet  
 b) 125-micron Polyethylene sheet, GSB, Subgrade, DLC and PQC  
 c) DLC, PQC, 125-micron Polyethylene sheet, GSB and Subgrade  
 d) Subgrade, GSB, DLC, 125-micron Polyethylene sheet and PQC
- 4) The standard wheel load considered for the design of flexible pavement using IIT PAVE software is: \_\_\_\_\_.  
 a) 10 kN on each single wheel  
 b) 20 kN on each single wheel  
 c) 30 kN on each single wheel  
 d) 40 kN on each single wheel
- 5) Arrange the correct sequence of design steps of flexible pavement design using IRC-37-2018.  
 1) Select a trial thickness  
 2) Actual strains using IIT PAVE  
 3) Calculation of Allowable strains  
 4) Calculation of resilient modulus of all materials  
 5) Comparison of Actual strains and allowable strains  
 a) 1, 2, 3, 4, 5  
 b) 5, 4, 2, 3, 1  
 c) 1, 4, 3, 2, 5  
 d) 4, 1, 5, 3, 2

- 6) In flexible pavement, the CTB and CTSB layers are designed based on \_\_\_\_\_.  
 a) CBR Value of material                      b) Modulus of subgrade reaction  
 c) Flexural strength                              d) Unconfined Compressive strength
- 7) The main purpose of the Dry Lean Concrete (DLC) layer in rigid pavement is to \_\_\_\_\_.  
 a) Provide good bond between two layers  
 b) Provide a good riding surface  
 c) Provide a effective drainage of pavement system  
 d) Provide a uniform, stable and permanent support to the concrete slab laid over it
- 8) As per IS-456-2000, the flexural strength can be calculated using the below equation: ( $F_{cr}$  - Flexural strength of concrete &  $f_{ck}$  - characteristic compressive strength of concrete)  
 a)  $F_{cr} = 0.7\sqrt{f_{ck}}$                               b)  $F_{cr} = 0.78\sqrt{f_{ck}}$   
 c)  $F_{cr} = 0.75\sqrt{f_{ck}}$                               d)  $F_{cr} = 0.8\sqrt{f_{ck}}$
- 9) The dowel bars are designed based on \_\_\_\_\_.  
 a) Yield stress of dowel bars  
 b) Bearing stress of dowel bars  
 c) Tensile strength of dowel bars  
 d) Allowable working stress in dowel bar
- 10) Identify the correct order of construction of flexible pavement from top to bottom.  
 1) Subgrade  
 2) Prime Coat  
 3) Tack Coat  
 4) Dense Bituminous Macadam  
 5) Bituminous Concrete  
 6) Wet Mix Macadam  
 7) Granular Subbase  
 Select the correct answer from below options:  
 a) 1,2,3,4,5,6,7                              b) 1,7,6,2,4,3 and 5  
 c) 1,6,7,3,5,2 and 4                              d) 5,3,4,2,6,7 and 1
- 11) In three-layer elastic system of pavement design, what is Layer-1,2 and 3 (From top to Bottom).  
 a) Layer-1-Subgrade, Layer-2-BC and DBM and Layer-3-WMM and GSB  
 b) Layer-1- WMM and GSB, Layer-2-BC and DBM and Layer-3- Subgrade  
 c) Layer-1-Subgrade, Layer-2- WMM and GSB and Layer-3- BC and DBM  
 d) Layer-1- BC and DBM, Layer-2- WMM and GSB, Layer-3-Subgrade
- 12) \_\_\_\_\_ is a multiplier to convert the given number of commercial vehicles having different axle configurations and different axle weights into an equivalent number of standard axle load (80 kN single axle with dual wheels) repetitions.  
 a) Lane Distribution Factor  
 b) Vehicle Damage Factor  
 c) Directional Distribution Factor  
 d) Cumulative no of standard axles

- 13)** Identify the correct statement regarding the locations of critical strains in the design of flexible pavement.
- a) Tensile strain at the bottom of subgrade and vertical compressive strain on top of bituminous layer
  - b) Tensile strain at the top of subgrade and vertical compressive strain on bottom of bituminous layer
  - c) Tensile strain at the bottom of bituminous layer and vertical compressive strain on top of subgrade
  - d) Vertical compressive strain at the bottom of subgrade and Tensile strain at the bottom of bituminous layer
- 14)** The vehicle carries a rear single axle weight of 16 tonnes, what is the EWLF? (Use fourth power rule and considerer standard axle weight as 8.16 tonne)
- |          |          |
|----------|----------|
| a) 15.78 | b) 14.78 |
| c) 13.78 | d) 12.78 |

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**T. Y. (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Pavement Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I, Q. No. 2 is compulsory. Solve any one full question from remaining question no. 3 and 4  
 2) In Section – II, Q. No. 5 is compulsory. Solve any one full question from remaining question no. 6 and 7  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions** **10**

- a) Draw a neat sketch of flexible pavement and show component parts of all layers. Briefly explain function of all layers.
- b) Explain ESWL. Briefly explain the graphical method of determination of ESWL.
- c) What is VDF? Determine the Equivalent Wheel Load Factor or VDF value of the following two axle loads in terms of the standard axle load of 8.16 tonne.
  - 1) LCV with rear axle load of 2.0t
  - 2) HCV with rear axle load of 15.5t

**Q.3 Answer any two questions** **18**

- a) A flexible pavement of thickness 48cm is laid over a subgrade. A circular load of 16cm with uniform contact pressure  $6.5\text{kg/cm}^2$  is applied. Assume the elastic modulus of the subgrade as well as pavement layer to be  $900\text{kg/cm}^2$ . Use Deflection Factor chart given in **Fig-I**. Assuming homogenous elastic single layer system determine.
  - 1) The deflection of the pavement surface under the center of the load
  - 2) The total thickness of flexible pavement using data Design Wheel Load=5000kg, Tyre pressure= $6.0\text{kg/cm}^2$ , Elastic modulus= $150\text{kg/cm}^2$  and permissible deflection=0.25cm
- b) If the CBR of the soil used in the upper 500 mm of embankment is 8% and the CBR of the borrow soil used for preparing the 500 mm thick compacted subgrade above embankment is 20%, what is the effective subgrade Modulus/CBR for design of flexible pavement? Consider Poisson's ratio=0.35. Use surface deflection,  $\delta=1.41\text{mm}$  from IIT PAVE software. Draw a neat sketch of equivalent subgrade system diagram.
- c) Design a bituminous pavement as per IRC-37-2018 with Granular Base and Sub-base layers using the following input data.
  - 1) Four lane divided carriageway
  - 2) Initial traffic in the year of completion of construction = 5000 cvpd (two-way)
  - 3) Traffic growth rate per annum = 6.0 per cent
  - 4) Design life period = 20 years
  - 5) Vehicle damage factor = 5.2



- 6) Effective CBR of subgrade estimated = 7 %
- 7) Marshall mix design carried out on the bituminous mix to be used in the bottom bituminous layer (DBM) for an air void content of 3 % resulted in an effective bitumen content (by volume) of 11.5 %
- 8) Lane Distribution Factor=0.75
- 9) Computed horizontal tensile strain using IIT PAVE software = 0.000146.
- 10) Computed vertical compressive strain using IIT PAVE software = 0.000243
- 11) Consider VG-40 grade bitumen with resilient modulus of 3000 Mpa
- 12) Poisson's ratio=0.35

Assume trial thickness as below: BC-40mm, DBM-150mm, WMM-250mm and GSB- 230mm.

**Q.4 Answer any three questions**

**18**

- a) Draw a neat sketch of rigid pavement and show component parts of all layers. Briefly explain function of all layers.
- b) With sketch describe the significance of design wheel load and contact pressure in design of pavement.
- c) Find ESWT at depths of 50mm, 200mm and 400mm for a dual wheel carrying 2044 kN each. The centre-to-centre tyre spacing is 200mm and distance between the walls of the two tyres is 100 mm. Use (log) equation to calculate ESWL.
- d) Plate bearing tests were conducted using 30cm diameter plate on soil subgrade and over a base course of thickness 45cm. The pressure yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm<sup>2</sup> and 8kg/cm<sup>2</sup> respectively. Design the thickness requirement of flexible pavement for a wheel load of 5100kg with tyre pressure of 8.0kg/cm<sup>2</sup> for an allowable deflection of 0.5cm using Burmister two-layer deflection factor chart shown in **Fig-II**.

**Section – II**

**Q.5 Answer any two questions**

**10**

- a) What is the objective of providing dowel bars and tie bars in rigid pavement?
- b) With a diagram explain the working principle of Benkelman beam for measurement of pavement deflection.
- c) C.C. Pavement is constructed using the following data:
  - 1) Modulus of elasticity  $3.3 \times 10^5$  kg/cm<sup>2</sup>
  - 2) Poisson's ratio=0.15
  - 3) Thickness of CC pavement = 18 cm
  - 4) Modulus of subgrade reaction-25kg/cm<sup>3</sup>
  - 5) Wheel load = 4100 kg
  - 6) Radius of loaded area = 12 cm
 Calculate stresses at Interior, Edge and corner by Westergaard's method.

**Q.6 Answer any two questions**

- a) Determine the warping stresses at interior, edge and corner of a 25cm thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction  $K$  is  $6.9\text{kg/cm}^3$  and radius of loaded area is 15cm. Assume temperature differential during day to be  $0.6^\circ\text{C}$  per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of  $0.4^\circ\text{C}$  per cm slab thickness during the night (for warping stress at the corner). Assume  $e=10 \times 10^{-6}\text{per}^\circ\text{C}$ ,  $E=3 \times 10^5 \text{ kg/cm}^2$ ,  $\mu=0.15$ . Use Bradbury chart given in **Figure-III**.
- b) Design the thickness cement concrete pavement as per IRC-58-2002 for a two-lane two-way National Highway in Gujarat State. The total two-way traffic is 3000 commercial vehicles per day at the end of the construction period. The design parameters are:
- 1) Flexural strength of Concrete= $81.5\text{kg/cm}^2$
  - 2) Effective Modulus of subgrade reaction of the DLC= $24.25\text{kg/cm}^3$
  - 3) Elastic modulus of concrete= $40417\text{kg/cm}^2$
  - 4) Poisson's ratio= $0.15$
  - 5) CBR of subgrade soil= $6.0\%$
  - 6) Coefficient of thermal coefficient= $10 \times 10^{-6}/^\circ\text{C}$
  - 7) Rate of traffic increase= $0.075$
  - 8) Spacing of contraction joints= $4.5\text{m}$
  - 9) Width of slab= $3.5\text{m}$
  - 10) Load Safety Factor= $1.2$
  - 11) Assume Trial Thickness= $33\text{cm}$
  - 12) The temperature differential= $21^\circ\text{C}$
  - 13) Tyre Pressure= $8\text{kg/cm}^2$
  - 14) Design life= $20$  years
  - 15) Wheel Load= $8000\text{kg}$
  - 16) Joint width= $2.0\text{cm}$
  - 17) Assume trial thickness= $19\text{cm}$

Note: Check for temperature stress at edge and Corner is not necessary  
The axle load spectrum obtained from axle load survey and stress ratio with allowable repetitions are given in **Table-1** and **2** respectively.

**Table-1** - Axle Load Survey Data with Stress from chart

Single Axle Loads			Tandem Axle Loads		
Axle Load class, tons	Percentage of axle loads	Stress, $\text{kg/cm}^2$	Axle Load class, tons	Percentage of axle loads	Stress, $\text{kg/cm}^2$
19-21	0.6	42.30	34-38	0.3	30.24
17-19	1.5	39.0	30-34	0.3	-
15-17	4.8	35.50	26-30	0.6	-
13-15	10.8	33.80	22-26	1.8	-
11-13	22	-	18-22	1.5	-
9-11	23.3	-	14-18	0.5	-
< 9	30.0	-	<14	2.0	-

**Table-2** - Stress Ratio and Allowable Repetition in CC Pavement

Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions	Stress Ratio	Allowable Repetitions
0.45	$6.279 \times 10^7$	0.66	$5.83 \times 10^3$	0.55	$1.24 \times 10^4$	0.76	361
0.46	$1.4335 \times 10^8$	0.67	$4.41 \times 10^3$	0.56	$9.41 \times 10^3$	0.77	274
0.47	$5.2 \times 10^6$	0.68	$3.34 \times 10^3$	0.57	$7.12 \times 10^3$	0.78	207
0.48	$2.4 \times 10^6$	0.69	2531	0.58	$5.4 \times 10^3$	0.79	157
0.49	$1.287 \times 10^6$	0.70	1970	0.59	$4.08 \times 10^3$	0.80	119
0.50	$7.62 \times 10^5$	0.71	1451	0.60	$3.09 \times 10^3$	0.81	90
0.51	$4.85 \times 10^5$	0.72	1099	0.61	$2.34 \times 10^3$	0.82	68
0.52	$3.26 \times 10^5$	0.73	832	0.62	$1.77 \times 10^3$	0.83	52
0.53	$2.29 \times 10^5$	0.74	630	0.63	$1.34 \times 10^3$	0.84	39
0.54	$1.66 \times 10^5$	0.75	477	0.64	$1.02 \times 10^3$	0.85	30
				0.65	$7.7 \times 10^2$		

c) Design a Dowel bar as per IRC-58-2015 using given data below:

- 1) Slab thickness,  $h = 300$  mm
- 2) Joint width,  $z = 20$  mm
- 3) Modulus of subgrade reaction,  $k = 80$  MPa/m
- 4) Radius of relative stiffness,  $l = 1035.3$  mm
- 5)  $E$  for dowel bar  $= 2 \times 10^5$  MPa
- 6) Modulus of dowel support,  $k_{mds} = 415000$  MPa/m
- 7) Wheel load for dowel bar design  $= 80$  kN
- 8) Load Transfer  $= 40\%$
- 9) Characteristics compressive Strength of Concrete,  $f_{ck} = 40$  MPa for M40 grade
- 10) Assume Diameter of Dowel bar  $= 38$  mm, Length  $= 500$  mm & spacing  $= 300$  mm
- 11) First dowel bar is placed at a distance of 150 mm from the pavement edge

**Q.7 Answer any three questions**

**18**

a) Design a Tie bar as per IRC-58-2015 using given data below:

- 1) Slab Thickness  $= 0.33$  m
- 2) Lane width,  $b = 3.5$  m
- 3) Coefficient of friction,  $f = 1.5$
- 4) Density of concrete,  $kN/m^3 = 24$
- 5) Allowable tensile stress in plain bars, MPa  $= 125$
- 6) Allowable bond stress for plain tie bars, MPa  $= 1.75$
- 7) Allowable bond stress for deformed tie bars, MPa  $= 2.46$
- 8) Assume Diameter of Tie bar  $= 12$  mm
- 9) Design Tie bar at plain bars

b) Write a short note on any two:

- 1) Factors effecting flexible pavement design
- 2) Layered systems concepts of Pavement Design
- 3) Factors effecting Rigid Pavement Design
- 4) Principles of Rigid Pavement Design as per IRC-58-2015

- c) The BBD studies conducted on a two-lane existing pavement. Design the overlay thickness as per IRC-81 using the data given below: Use **Figure-IV** for overlay thickness.

- 1) Consider moisture correction factor seasonal correction factor= 1.04
- 2) Cumulative number of standard axles=100msa

Table-3-BBD Survey Data:

Chainage	17	17.05	17.1	17.15	17.2	17.25	17.3	17.35
Rebound Deflection, mm	0.84	0.83	0.32	1.57	0.52	0.44	0.43	0.67
Pavement Temperature, °C	37	37	37	37	37	37	37	37

- d) Explain how warping stresses are formed in C.C. pavements. Describe the Westergaard's equations to calculate warping stresses at critical locations.

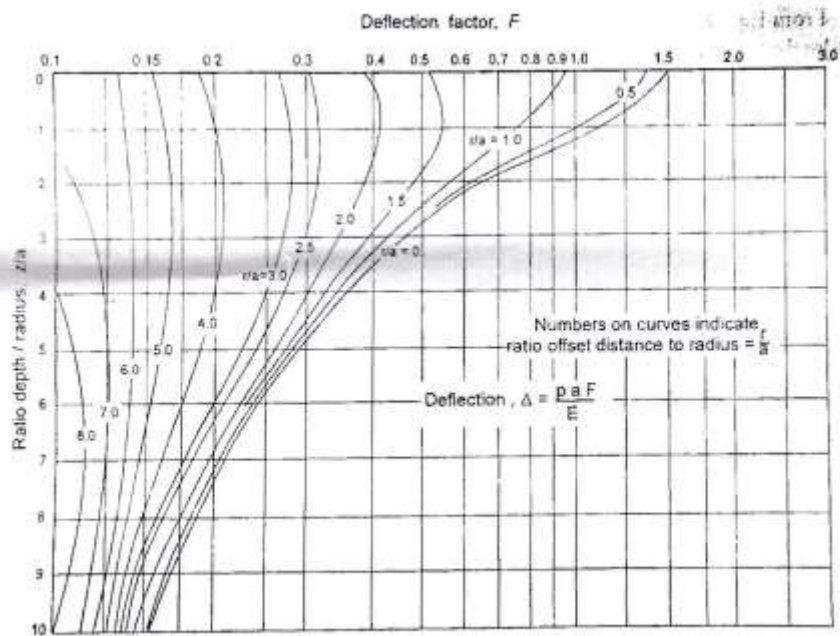


Figure-I-Deflection Factor Chart (Single Layer)

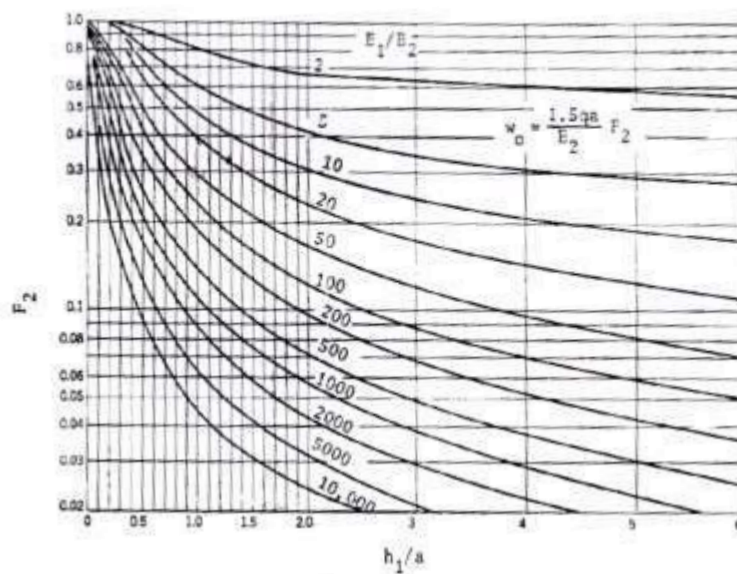


Figure-II-Burmister two-layer deflection chart

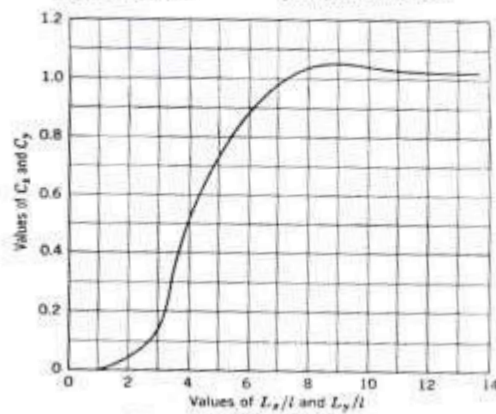
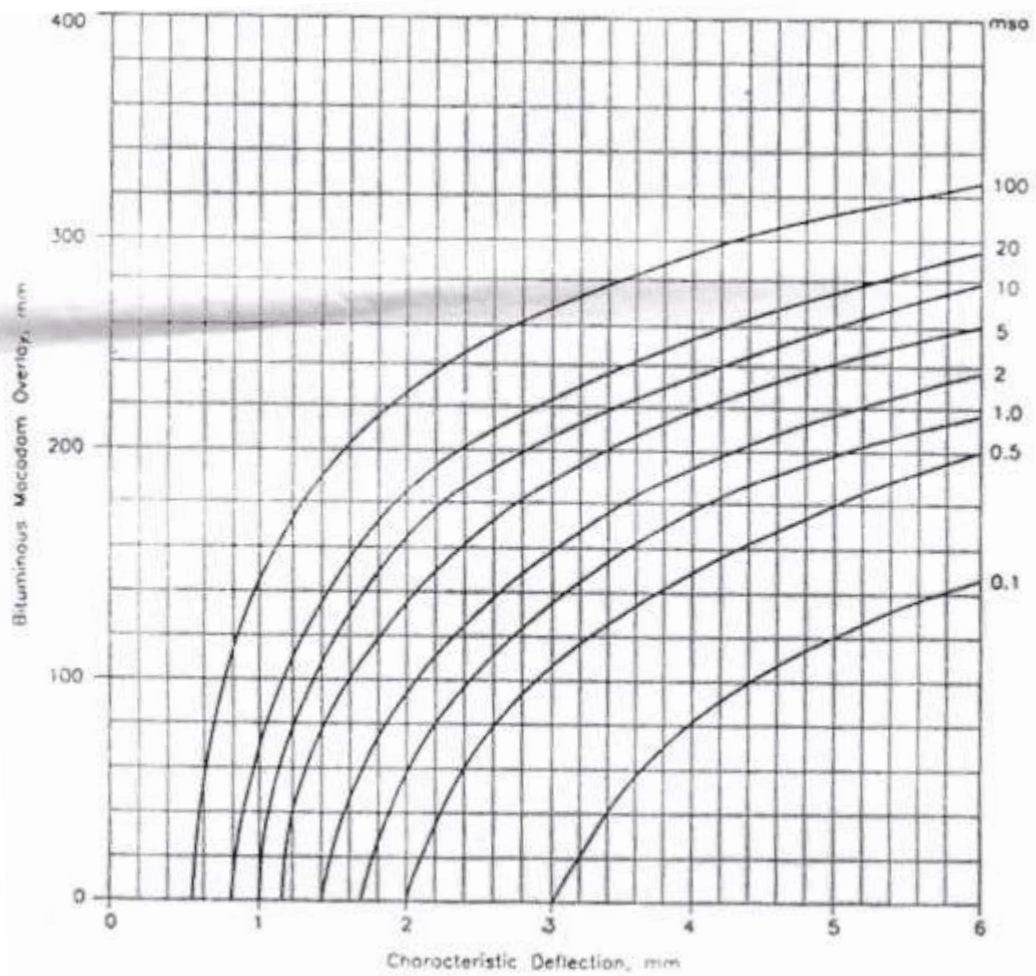


Figure-III-Bradbury Chart

**Figure-IV-Overlay Thickness Curves**

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Set

P

**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov- 2022**  
**CIVIL ENGINEERING**

**Infrastructure Planning and Management**

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ offers a set of techniques that give you the Practical Performance Analyst the opportunity to understand change in application.
  - a) Capacity building
  - b) Life cycle technique
  - c) Performance Modeling
  - d) None
- 2) The best practices in IT Infrastructure include \_\_\_\_\_.
  - a) Knowledge Gathering
  - b) Creation of Standards
  - c) Maintaining Consistency
  - d) all of these
- 3) \_\_\_\_\_ risk is an institutional risk.
  - a) Site related
  - b) Operation
  - c) Cultural
  - d) None
- 4) 'Insurance requirements is a \_\_\_\_\_ risk mitigation technique'.
  - a) Contractual
  - b) Operation
  - c) Cultural
  - d) None
- 5) '\_\_\_\_\_ discoveries could lead to delays in approvals'.
  - a) Historical
  - b) Archaeological
  - c) Cultural
  - d) None
- 6) 'Partnering and team building is a \_\_\_\_\_ risk mitigation methodology'.
  - a) Non-Contractual
  - b) Operation
  - c) Cultural
  - d) Site related
- 7) Political instability comes under \_\_\_\_\_ risk.
  - a) Contractual
  - b) Operation
  - c) Economic
  - d) Site related
- 8) The assertion 'improper geological investigations is site related risk' is, \_\_\_\_\_.
  - a) True
  - b) False
  - c) Partially true
  - d) None

- 9) A life cycle assessment (LCA) measures the \_\_\_\_\_ impacts of a product or service.
- |               |                  |
|---------------|------------------|
| a) Mechanical | b) Environmental |
| c) Political  | d) Social        |
- 10) Role of civil engineering is \_\_\_\_\_.
- a) providing good transportation facilities
  - b) providing well planned water supply
  - c) providing good infrastructure
  - d) all of above
- 11) Smart city \_\_\_\_\_.
- a) can provide opportunity to develop
  - b) should provide cost effective health care
  - c) should provide modern lifestyle for future generation
  - d) None of these
- 12) India has \_\_\_\_\_ largest railway network in the world.
- |          |           |
|----------|-----------|
| a) first | b) second |
| c) third | d) fourth |
- 13) About \_\_\_\_\_ % of energy developed in India is by thermal power plants.
- |       |       |
|-------|-------|
| a) 51 | b) 61 |
| c) 71 | d) 81 |
- 14) \_\_\_\_\_ is the suitable final work plan to a time scale.
- |              |               |
|--------------|---------------|
| a) Budgeting | b) Scheduling |
| c) Work flow | d) Auditing   |



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P

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**Infrastructure Planning and Management**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Solve any two questions from Section I.  
 2) Solve any two questions from Section II.  
 3) Assume suitable data if required and mention it clearly.

**Section – I**

- Q.2** a) What is project life cycle? Explain in brief. **05**  
 b) Enlist different players involved in an infrastructure project. **04**  
 c) Classify infrastructures with examples. **05**
- Q.3** a) Enlist risks involved in Infrastructure projects. Explain any one in brief. **05**  
 b) Describe the duties of an Infrastructure engineer. **04**  
 c) Write the importance of Special Economic Zone. Highlight its advantages. **05**
- Q.4** a) Demonstrate the usefulness of public private partnership (PPP). Identify the sectors which can adopt it. **06**  
 b) Compare merits and demerits of privatization of different sectors. **08**

**Section – II**

- Q.5** a) State the importance of Project planning. **05**  
 b) Elaborate the meaning of Performance Modelling and Life Cycle Analysis techniques. **05**  
 c) How can be Improved the Government's role in infrastructure Implementation? **04**
- Q.6** a) What are the stages in successful planning of infrastructure? Write in detail all the stages involved. **08**  
 b) Explain 'An integrated framework for successful Infrastructure'. **06**
- Q.7** **Write notes on (Any two).** **14**  
 a) Role of infrastructure in development of Nation  
 b) Construction risks mitigation  
 c) Transportation Sector of infrastructure

<b>Seat No.</b>	
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## Infrastructure Planning and Management

Max. Marks: 70

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Marks: 14

14

- 1) The assertion 'improper geological investigations is site related risk' is, \_\_\_\_\_.  
a) True    b) False  
c) Partially true                                    d) None
- 2) A life cycle assessment (LCA) measures the \_\_\_\_\_ impacts of a product or service.  
a) Mechanical                                         b) Environmental  
c) Political    d) Social
- 3) Role of civil engineering is \_\_\_\_\_.  
a) providing good transportation facilities  
b) providing well planned water supply  
c) providing good infrastructure  
d) all of above
- 4) Smart city \_\_\_\_\_.  
a) can provide opportunity to develop  
b) should provide cost effective health care  
c) should provide modern lifestyle for future generation  
d) None of these
- 5) India has \_\_\_\_\_ largest railway network in the world.  
a) first    b) second  
c) third     d) fourth
- 6) About \_\_\_\_\_ % of energy developed in India is by thermal power plants.  
a) 51    b) 61  
c) 71    d) 81
- 7) \_\_\_\_\_ is the suitable final work plan to a time scale.  
a) Budgeting    b) Scheduling  
c) Work flow                                         d) Auditing
- 8) \_\_\_\_\_ offers a set of techniques that give you the Practical Performance Analyst the opportunity to understand change in application.  
a) Capacity building                                 b) Life cycle technique  
c) Performance Modeling                         d) None

- 9) The best practices in IT Infrastructure include \_\_\_\_\_.  
a) Knowledge Gathering                      b) Creation of Standards  
c) Maintaining Consistency                d) all of these
- 10) \_\_\_\_\_ risk is an institutional risk.  
a) Site related                                      b) Operation  
c) Cultural    d) None
- 11) 'Insurance requirements is a \_\_\_\_\_ risk mitigation technique'.  
a) Contractual                                      b) Operation  
c) Cultural    d) None
- 12) '\_\_\_\_\_ discoveries could lead to delays in approvals'.  
a) Historical    b) Archaeological  
c) Cultural    d) None
- 13) 'Partnering and team building is a \_\_\_\_\_ risk mitigation methodology'.  
a) Non-Contractual                                b) Operation  
c) Cultural    d) Site related
- 14) Political instability comes under \_\_\_\_\_ risk.  
a) Contractual                                      b) Operation  
c) Economic    d) Site related

Seat No.	
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov- 2022**  
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**Infrastructure Planning and Management**

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**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is project life cycle? Explain in brief.  | <b>05</b> |
|            | <b>b)</b> Enlist different players involved in an infrastructure project.  | <b>04</b> |
|            | <b>c)</b> Classify infrastructures with examples.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Enlist risks involved in Infrastructure projects. Explain any one in brief.                              | <b>05</b> |
|            | <b>b)</b> Describe the duties of an Infrastructure engineer.   | <b>04</b> |
|            | <b>c)</b> Write the importance of Special Economic Zone. Highlight its advantages.                                 | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Demonstrate the usefulness of public private partnership (PPP). Identify the sectors which can adopt it. | <b>06</b> |
|            | <b>b)</b> Compare merits and demerits of privatization of different sectors.                                       | <b>08</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> State the importance of Project planning.  | <b>05</b> |
|            | <b>b)</b> Elaborate the meaning of Performance Modelling and Life Cycle Analysis techniques.                     | <b>05</b> |
|            | <b>c)</b> How can be Improved the Government's role in infrastructure Implementation?                            | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> What are the stages in successful planning of infrastructure? Write in detail all the stages involved. | <b>08</b> |
|            | <b>b)</b> Explain 'An integrated framework for successful Infrastructure'.                                       | <b>06</b> |
| <b>Q.7</b> | <b>Write notes on (Any two).</b>   | <b>14</b> |
|            | <b>a)</b> Role of infrastructure in development of Nation  |           |
|            | <b>b)</b> Construction risks mitigation  |           |
|            | <b>c)</b> Transportation Sector of infrastructure  |           |

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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov- 2022**  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Smart city \_\_\_\_\_.  
 a) can provide opportunity to develop  
 b) should provide cost effective health care  
 c) should provide modern lifestyle for future generation  
 d) None of these
- 2) India has \_\_\_\_\_ largest railway network in the world.  
 a) first  
 b) second  
 c) third  
 d) fourth
- 3) About \_\_\_\_\_ % of energy developed in India is by thermal power plants.  
 a) 51  
 b) 61  
 c) 71  
 d) 81
- 4) \_\_\_\_\_ is the suitable final work plan to a time scale.  
 a) Budgeting  
 b) Scheduling  
 c) Work flow  
 d) Auditing
- 5) \_\_\_\_\_ offers a set of techniques that give you the Practical Performance Analyst the opportunity to understand change in application.  
 a) Capacity building  
 b) Life cycle technique  
 c) Performance Modeling  
 d) None
- 6) The best practices in IT Infrastructure include \_\_\_\_\_.  
 a) Knowledge Gathering  
 b) Creation of Standards  
 c) Maintaining Consistency  
 d) all of these
- 7) \_\_\_\_\_ risk is an institutional risk.  
 a) Site related  
 b) Operation  
 c) Cultural  
 d) None
- 8) 'Insurance requirements is a \_\_\_\_\_ risk mitigation technique'.  
 a) Contractual  
 b) Operation  
 c) Cultural  
 d) None
- 9) '\_\_\_\_\_ discoveries could lead to delays in approvals'.  
 a) Historical  
 b) Archaeological  
 c) Cultural  
 d) None

- 10)** 'Partnering and team building is a \_\_\_\_\_ risk mitigation methodology'.
- a) Non-Contractual
  - b) Operation
  - c) Cultural
  - d) Site related
- 11)** Political instability comes under \_\_\_\_\_ risk.
- a) Contractual
  - b) Operation
  - c) Economic
  - d) Site related
- 12)** The assertion 'improper geological investigations is site related risk' is, \_\_\_\_\_.
- a) True
  - b) False
  - c) Partially true
  - d) None
- 13)** A life cycle assessment (LCA) measures the \_\_\_\_\_ impacts of a product or service.
- a) Mechanical
  - b) Environmental
  - c) Political
  - d) Social
- 14)** Role of civil engineering is \_\_\_\_\_.
- a) providing good transportation facilities
  - b) providing well planned water supply
  - c) providing good infrastructure
  - d) all of above

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**Set R**

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**Section – I**

- Q.2** a) What is project life cycle? Explain in brief. **05**  
 b) Enlist different players involved in an infrastructure project. **04**  
 c) Classify infrastructures with examples. **05**
- Q.3** a) Enlist risks involved in Infrastructure projects. Explain any one in brief. **05**  
 b) Describe the duties of an Infrastructure engineer. **04**  
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- Q.4** a) Demonstrate the usefulness of public private partnership (PPP). Identify the sectors which can adopt it. **06**  
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**Section – II**

- Q.5** a) State the importance of Project planning. **05**  
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- Q.6** a) What are the stages in successful planning of infrastructure? Write in detail all the stages involved. **08**  
 b) Explain 'An integrated framework for successful Infrastructure'. **06**
- Q.7** **Write notes on (Any two).** **14**  
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 b) Construction risks mitigation  
 c) Transportation Sector of infrastructure

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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov- 2022**  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) 'Partnering and team building is a \_\_\_\_\_ risk mitigation methodology'.  
 a) Non-Contractual                      b) Operation  
 c) Cultural                                  d) Site related
- 2) Political instability comes under \_\_\_\_\_ risk.  
 a) Contractual                              b) Operation  
 c) Economic                                d) Site related
- 3) The assertion 'improper geological investigations is site related risk' is, \_\_\_\_\_.  
 a) True                                        b) False  
 c) Partially true                              d) None
- 4) A life cycle assessment (LCA) measures the \_\_\_\_\_ impacts of a product or service.  
 a) Mechanical                                b) Environmental  
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- 5) Role of civil engineering is \_\_\_\_\_.  
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- 7) India has \_\_\_\_\_ largest railway network in the world.  
 a) first                                        b) second  
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- 8) About \_\_\_\_\_ % of energy developed in India is by thermal power plants.  
 a) 51    b) 61  
 c) 71    d) 81



- 9) \_\_\_\_\_ is the suitable final work plan to a time scale.
- a) Budgeting
  - b) Scheduling
  - c) Work flow
  - d) Auditing
- 10) \_\_\_\_\_ offers a set of techniques that give you the Practical Performance Analyst the opportunity to understand change in application.
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- 12) \_\_\_\_\_ risk is an institutional risk.
- a) Site related
  - b) Operation
  - c) Cultural
  - d) None
- 13) 'Insurance requirements is a \_\_\_\_\_ risk mitigation technique'.
- a) Contractual
  - b) Operation
  - c) Cultural
  - d) None
- 14) '\_\_\_\_\_ discoveries could lead to delays in approvals'.
- a) Historical
  - b) Archaeological
  - c) Cultural
  - d) None

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**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is project life cycle? Explain in brief.  | <b>05</b> |
|            | <b>b)</b> Enlist different players involved in an infrastructure project.  | <b>04</b> |
|            | <b>c)</b> Classify infrastructures with examples.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Enlist risks involved in Infrastructure projects. Explain any one in brief.                              | <b>05</b> |
|            | <b>b)</b> Describe the duties of an Infrastructure engineer.   | <b>04</b> |
|            | <b>c)</b> Write the importance of Special Economic Zone. Highlight its advantages.                                 | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Demonstrate the usefulness of public private partnership (PPP). Identify the sectors which can adopt it. | <b>06</b> |
|            | <b>b)</b> Compare merits and demerits of privatization of different sectors.                                       | <b>08</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> State the importance of Project planning.  | <b>05</b> |
|            | <b>b)</b> Elaborate the meaning of Performance Modelling and Life Cycle Analysis techniques.                     | <b>05</b> |
|            | <b>c)</b> How can be Improved the Government's role in infrastructure Implementation?                            | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> What are the stages in successful planning of infrastructure? Write in detail all the stages involved. | <b>08</b> |
|            | <b>b)</b> Explain 'An integrated framework for successful Infrastructure'.                                       | <b>06</b> |
| <b>Q.7</b> | <b>Write notes on (Any two).</b>   | <b>14</b> |
|            | <b>a)</b> Role of infrastructure in development of Nation  |           |
|            | <b>b)</b> Construction risks mitigation  |           |
|            | <b>c)</b> Transportation Sector of infrastructure  |           |

Seat No.	
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## Solid and Hazardous Waste Management

Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

- 1) Composting process is affected due to \_\_\_\_\_.  
a) Temperature                      b) Moisture content  
c) C/N ratio                          d) All of the above
- 2) Household hazardous waste includes batteries and \_\_\_\_\_.  
a) Radioactive waste                b) Food waste  
c) Leachate                          d) Nail Polish
- 3) What is recovered in the magnetic separation?  
a) Ferrous materials                b) Non-Ferrous materials  
c) Heat                                d) None of the above
- 4) Separation, processing of solid waste are used to reduce \_\_\_\_\_.  
a) Volume of S.W.                    b) Weight of S.W.  
c) Both a) and b)                    d) None of the above
- 5) The composting process of SWM is \_\_\_\_\_.  
a) Endothermic                      b) Exothermic  
c) Heterothermal                    d) None of the above
- 6) \_\_\_\_\_ is the cheapest method of waste disposal.  
a) Incineration                      b) Pyrolysis  
c) Landfills                          d) Composting
- 7) Biomedical Wastes and management rules was implemented in year \_\_\_\_\_.  
a) 1980                                b) 1998  
c) 2000                                d) 2016
- 8) What is the main purpose of hazard identification?  
a) To minimize the effect of a consequence  
b) For better risk management  
c) To characterize adverse effect of toxins  
d) To reduce probability of occurrence



Seat No.	
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Set **P**

**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Solid and Hazardous Waste Management**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Estimate the moisture content of solid waste sample of 150 kg using the following data **05**

Sr. No.	Component	% by mass	Moisture content (%)
1	food waste	15	62
2	paper	30	10
3	cardboards	08	06
4	plastic	12	03
5	grass	12	60
6	wood	06	04
7	metals	17	03

- b)** Explain various factors affecting Solid waste management of a city. **05**

- Q.3 a)** Enlist and explain numerous types of incinerators with a neat sketch. **05**

- b)** Solid waste weighing 250 tonnes is used for incineration as per MSW norms. Calculate heat value in kJ/kg using Ultimate analysis method. **04**

Following constituents of the waste are:

Carbon - 180 tonnes

Hydrogen - 10 tonnes

Oxygen - 60 tonnes

- Q.4 a)** Explain methodology, and factors affecting composting process. **05**

- b)** Explain advantages of shredding in detail. **04**

- Q.5 Write short notes on following (any three):** **09**

- Bangalore composting
- Recycling of plastic waste
- SWM rules
- Physical characteristics of solid waste

**Section – II**

<b>Q.6</b>	<b>a)</b> Define “hazards” and discuss the characteristics of “hazards”.	<b>06</b>
	<b>b)</b> Classify the types of hazards.	<b>04</b>
<b>Q.7</b>	<b>a)</b> Analyze the risk assessment plan in case of earthquake.	<b>05</b>
	<b>b)</b> Discuss the various qualitative assessment of damage.	<b>04</b>
<b>Q.8</b>	<b>a)</b> Discuss the various types of hazardous wastes.	<b>05</b>
	<b>b)</b> Illustrate the characteristics of hazardous waste using examples.	<b>04</b>
<b>Q.9</b>	<b>a)</b> Discuss the guidelines for storage of hazardous waste.	<b>05</b>
	<b>b)</b> Describe the various types of Landfills.	<b>04</b>

Seat No.	
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Set 

Q
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Solid and Hazardous Waste Management**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) What is the main purpose of hazard identification?  
 a) To minimize the effect of a consequence  
 b) For better risk management  
 c) To characterize adverse effect of toxins  
 d) To reduce probability of occurrence
- 2) Characteristic of hazardous waste that causes fire is \_\_\_\_\_.  
 a) Ignitibility  
 b) Corrosivity  
 c) Reactivity  
 d) Toxicity
- 3) Acidic waste possess \_\_\_\_\_ character.  
 a) Ignitable  
 b) Corrosive  
 c) Toxic  
 d) Reactive
- 4) Which of the following is the most important variable in the construction of soil liners?  
 a) Type of compaction  
 b) Permeability  
 c) Flammability  
 d) Ignitability
- 5) Drainage pipes of leachate collection system is filled with \_\_\_\_\_.  
 a) Gravel  
 b) Dust  
 c) Clay  
 d) Grass
- 6) What is the normal storage time of incinerable hazardous waste at the incinerator site?  
 a) 4 months  
 b) 5 months  
 c) 6 months  
 d) 7 months
- 7) According to CPCB the major criteria considered for selection of technologies are \_\_\_\_\_.  
 a) Waste quantity  
 b) Chemical analysis  
 c) Lead content  
 d) Mercury content
- 8) Composting process is affected due to \_\_\_\_\_.  
 a) Temperature  
 b) Moisture content  
 c) C/N ratio  
 d) All of the above

- 9) Household hazardous waste includes batteries and \_\_\_\_\_.  
a) Radioactive waste                      b) Food waste  
c) Leachate                                  d) Nail Polish
- 10) What is recovered in the magnetic separation?  
a) Ferrous materials                      b) Non-Ferrous materials  
c) Heat                                      d) None of the above
- 11) Separation, processing of solid waste are used to reduce \_\_\_\_\_.  
a) Volume of S.W.                      b) Weight of S.W.  
c) Both a) and b)                      d) None of the above
- 12) The composting process of SWM is \_\_\_\_\_.  
a) Endothermic                      b) Exothermic  
c) Heterothermic                      d) None of the above
- 13) \_\_\_\_\_ is the cheapest method of waste disposal.  
a) Incineration                      b) Pyrolysis  
c) Landfills                              d) Composting
- 14) Biomedical Wastes and management rules was implemented in year \_\_\_\_\_.  
a) 1980                                  b) 1998  
c) 2000                                  d) 2016



Seat No.	
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Set	Q
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Solid and Hazardous Waste Management**

Day & Date: Monday, 20-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Estimate the moisture content of solid waste sample of 150 kg using the following data **05**

Sr. No.	Component	% by mass	Moisture content (%)
1	food waste	15	62
2	paper	30	10
3	cardboards	08	06
4	plastic	12	03
5	grass	12	60
6	wood	06	04
7	metals	17	03

- b)** Explain various factors affecting Solid waste management of a city. **05**

- Q.3 a)** Enlist and explain numerous types of incinerators with a neat sketch. **05**

- b)** Solid waste weighing 250 tonnes is used for incineration as per MSW norms. Calculate heat value in kJ/kg using Ultimate analysis method. **04**

Following constituents of the waste are:

Carbon - 180 tonnes

Hydrogen - 10 tonnes

Oxygen - 60 tonnes

- Q.4 a)** Explain methodology, and factors affecting composting process. **05**

- b)** Explain advantages of shredding in detail. **04**

- Q.5 Write short notes on following (any three):** **09**

- Bangalore composting
- Recycling of plastic waste
- SWM rules
- Physical characteristics of solid waste

**Section – II**

<b>Q.6</b>	<b>a)</b> Define “hazards” and discuss the characteristics of “hazards”.	<b>06</b>
	<b>b)</b> Classify the types of hazards.	<b>04</b>
<b>Q.7</b>	<b>a)</b> Analyze the risk assessment plan in case of earthquake.	<b>05</b>
	<b>b)</b> Discuss the various qualitative assessment of damage.	<b>04</b>
<b>Q.8</b>	<b>a)</b> Discuss the various types of hazardous wastes.	<b>05</b>
	<b>b)</b> Illustrate the characteristics of hazardous waste using examples.	<b>04</b>
<b>Q.9</b>	<b>a)</b> Discuss the guidelines for storage of hazardous waste.	<b>05</b>
	<b>b)</b> Describe the various types of Landfills.	<b>04</b>

Seat No.	
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Set	R
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Solid and Hazardous Waste Management**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the following is the most important variable in the construction of soil liners?
 

a) Type of compaction	b) Permeability
c) Flammability	d) Ignitability
- 2) Drainage pipes of leachate collection system is filled with \_\_\_\_\_.
 

a) Gravel	b) Dust
c) Clay	d) Grass
- 3) What is the normal storage time of incinerable hazardous waste at the incinerator site?
 

a) 4 months	b) 5 months
c) 6 months	d) 7 months
- 4) According to CPCB the major criteria considered for selection of technologies are \_\_\_\_\_.
 

a) Waste quantity	b) Chemical analysis
c) Lead content	d) Mercury content
- 5) Composting process is affected due to \_\_\_\_\_.
 

a) Temperature	b) Moisture content
c) C/N ratio	d) All of the above
- 6) Household hazardous waste includes batteries and \_\_\_\_\_.
 

a) Radioactive waste	b) Food waste
c) Leachate	d) Nail Polish
- 7) What is recovered in the magnetic separation?
 

a) Ferrous materials	b) Non-Ferrous materials
c) Heat	d) None of the above
- 8) Separation, processing of solid waste are used to reduce \_\_\_\_\_.
 

a) Volume of S.W.	b) Weight of S.W.
c) Both a) and b)	d) None of the above

- 9) The composting process of SWM is \_\_\_\_\_.
  - a) Endothermic
  - b) Exothermic
  - c) Heterothermic
  - d) None of the above
- 10) \_\_\_\_\_ is the cheapest method of waste disposal.
  - a) Incineration
  - b) Pyrolysis
  - c) Landfills
  - d) Composting
- 11) Biomedical Wastes and management rules was implemented in year \_\_\_\_\_.
  - a) 1980
  - b) 1998
  - c) 2000
  - d) 2016
- 12) What is the main purpose of hazard identification?
  - a) To minimize the effect of a consequence
  - b) For better risk management
  - c) To characterize adverse effect of toxins
  - d) To reduce probability of occurrence
- 13) Characteristic of hazardous waste that causes fire is \_\_\_\_\_.
  - a) Ignitability
  - b) Corrosivity
  - c) Reactivity
  - d) Toxicity
- 14) Acidic waste possess \_\_\_\_\_ character.
  - a) Ignitable
  - b) Corrosive
  - c) Toxic
  - d) Reactive

Seat No.	
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Set **R**

**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Solid and Hazardous Waste Management**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
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 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Estimate the moisture content of solid waste sample of 150 kg using the following data **05**

Sr. No.	Component	% by mass	Moisture content (%)
1	food waste	15	62
2	paper	30	10
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6	wood	06	04
7	metals	17	03

- b)** Explain various factors affecting Solid waste management of a city. **05**

- Q.3 a)** Enlist and explain numerous types of incinerators with a neat sketch. **05**

- b)** Solid waste weighing 250 tonnes is used for incineration as per MSW norms. Calculate heat value in kJ/kg using Ultimate analysis method. **04**

Following constituents of the waste are:

Carbon - 180 tonnes

Hydrogen - 10 tonnes

Oxygen - 60 tonnes

- Q.4 a)** Explain methodology, and factors affecting composting process. **05**

- b)** Explain advantages of shredding in detail. **04**

- Q.5 Write short notes on following (any three):** **09**

- Bangalore composting
- Recycling of plastic waste
- SWM rules
- Physical characteristics of solid waste

**Section – II**

<b>Q.6</b>	<b>a)</b> Define “hazards” and discuss the characteristics of “hazards”.	<b>06</b>
	<b>b)</b> Classify the types of hazards.	<b>04</b>
<b>Q.7</b>	<b>a)</b> Analyze the risk assessment plan in case of earthquake.	<b>05</b>
	<b>b)</b> Discuss the various qualitative assessment of damage.	<b>04</b>
<b>Q.8</b>	<b>a)</b> Discuss the various types of hazardous wastes.	<b>05</b>
	<b>b)</b> Illustrate the characteristics of hazardous waste using examples.	<b>04</b>
<b>Q.9</b>	<b>a)</b> Discuss the guidelines for storage of hazardous waste.	<b>05</b>
	<b>b)</b> Describe the various types of Landfills.	<b>04</b>

Seat No.	
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Set	S
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Solid and Hazardous Waste Management**

Day & Date: Monday, 20-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ is the cheapest method of waste disposal.
 

a) Incineration	b) Pyrolysis
c) Landfills	d) Composting
- 2) Biomedical Wastes and management rules was implemented in year \_\_\_\_\_.
 

a) 1980	b) 1998
c) 2000	d) 2016
- 3) What is the main purpose of hazard identification?
 

a) To minimize the effect of a consequence
b) For better risk management
c) To characterize adverse effect of toxins
d) To reduce probability of occurrence
- 4) Characteristic of hazardous waste that causes fire is \_\_\_\_\_.
 

a) Ignitability	b) Corrosivity
c) Reactivity	d) Toxicity
- 5) Acidic waste possess \_\_\_\_\_ character.
 

a) Ignitable	b) Corrosive
c) Toxic	d) Reactive
- 6) Which of the following is the most important variable in the construction of soil liners?
 

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a) 4 months	b) 5 months
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- 9) According to CPCB the major criteria considered for selection of technologies are \_\_\_\_\_.
  - a) Waste quantity
  - b) Chemical analysis
  - c) Lead content
  - d) Mercury content
- 10) Composting process is affected due to \_\_\_\_\_.
  - a) Temperature
  - b) Moisture content
  - c) C/N ratio
  - d) All of the above
- 11) Household hazardous waste includes batteries and \_\_\_\_\_.
  - a) Radioactive waste
  - b) Food waste
  - c) Leachate
  - d) Nail Polish
- 12) What is recovered in the magnetic separation?
  - a) Ferrous materials
  - b) Non-Ferrous materials
  - c) Heat
  - d) None of the above
- 13) Separation, processing of solid waste are used to reduce \_\_\_\_\_.
  - a) Volume of S.W.
  - b) Weight of S.W.
  - c) Both a) and b)
  - d) None of the above
- 14) The composting process of SWM is \_\_\_\_\_.
  - a) Endothermic
  - b) Exothermic
  - c) Heterothermic
  - d) None of the above



Seat No.	
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Set **S**

**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Solid and Hazardous Waste Management**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
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 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Estimate the moisture content of solid waste sample of 150 kg using the following data **05**

Sr. No.	Component	% by mass	Moisture content (%)
1	food waste	15	62
2	paper	30	10
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4	plastic	12	03
5	grass	12	60
6	wood	06	04
7	metals	17	03

- b)** Explain various factors affecting Solid waste management of a city. **05**

- Q.3 a)** Enlist and explain numerous types of incinerators with a neat sketch. **05**

- b)** Solid waste weighing 250 tonnes is used for incineration as per MSW norms. Calculate heat value in kJ/kg using Ultimate analysis method. **04**

Following constituents of the waste are:

Carbon - 180 tonnes

Hydrogen - 10 tonnes

Oxygen - 60 tonnes

- Q.4 a)** Explain methodology, and factors affecting composting process. **05**

- b)** Explain advantages of shredding in detail. **04**

- Q.5 Write short notes on following (any three):** **09**

- Bangalore composting
- Recycling of plastic waste
- SWM rules
- Physical characteristics of solid waste

**Section – II**

<b>Q.6</b>	<b>a)</b> Define “hazards” and discuss the characteristics of “hazards”.	<b>06</b>
	<b>b)</b> Classify the types of hazards.	<b>04</b>
<b>Q.7</b>	<b>a)</b> Analyze the risk assessment plan in case of earthquake.	<b>05</b>
	<b>b)</b> Discuss the various qualitative assessment of damage.	<b>04</b>
<b>Q.8</b>	<b>a)</b> Discuss the various types of hazardous wastes.	<b>05</b>
	<b>b)</b> Illustrate the characteristics of hazardous waste using examples.	<b>04</b>
<b>Q.9</b>	<b>a)</b> Discuss the guidelines for storage of hazardous waste.	<b>05</b>
	<b>b)</b> Describe the various types of Landfills.	<b>04</b>

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Open Channel Flow & River Hydraulics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) At critical depth discharge is \_\_\_\_\_.  
 a) maximum for given specific energy  
 b) minimum for given specific energy  
 c) maximum for given specific force  
 d) minimum for given specific force
- 2) Uniform flow in open channel exists when the flow is steady and the channel is \_\_\_\_\_.  
 a) Friction less  
 b) Non prismatic  
 c) Prismatic  
 d) Prismatic and depth of flow is constant along the channel
- 3) If the Froude's number is 8.2 then the jump is known as \_\_\_\_\_.  
 a) Steady  
 b) Oscillating  
 c) Undular  
 d) none
- 4) Specific force represents the sum of pressure force and \_\_\_\_\_.  
 a) Datum head  
 b) Momentum flux per unit weight  
 c) Momentum flux and datum head  
 d) None
- 5) The flow in open channel may be characterized as laminar when \_\_\_\_\_.  
 a)  $Re < 500$   
 b)  $Re > 2000$   
 c)  $Re > 4000$   
 d)  $500 < Re < 2000$
- 6) For the trapezoidal section \_\_\_\_\_.  
 a) Side slope equal to  $45^\circ$   
 b) Depth of flow equal to half bed width  
 c) Shape is of half hexagon  
 d) None

- 7) River plains are made up of \_\_\_\_\_.  
a) Alluvium Black soil                      b) Red soil  
c) Black soil                                      d) None
- 8) The maximum velocity in open channel occurs at \_\_\_\_\_.  
a) Near the channel bottom                  b) At the free surface  
c) Little below the free surface              d) None
- 9) On what basis for designing the regime state is obtained?  
a) Silt and Velocity of Flow                  b) Silt  
c) Velocity    d) Depth of Channel
- 10) Whose theory was the first to provide semi-theoretical analysis of the problem of incipient condition of bed motion?  
a) Lacey's theory                                  b) Kennedy's theory  
c) Shield's theory                                d) Strickler's equation
- 11) The Lacey's equation for a regime channel consists of a set of 'x' independent equation relating to flow, where 'x' is equal to \_\_\_\_\_.  
a) 1    b) 3  
c) 5    d) 8
- 12) River training work serves the following purposes:  
a) Protect the river bed and banks  
b) Direct the river flow in desired condition  
c) Increase or decrease of the river discharge  
d) Protect the surrounding land from flooding
- 13) The dimension of Kinematic viscosity is \_\_\_\_\_.  
a)  $LT^{-2}$     b)  $L^2T^{-1}$   
c)  $L^3T^{-1}$     d)  $LT^{-1}$
- 14) Kinematic similarity between model and prototype is the similarity of \_\_\_\_\_.  
a) Discharge    b) Streamline pattern  
c) Shape    d) Forces

Seat No.	
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Set	P
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Open Channel Flow & River Hydraulics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
2) All questions are compulsory.  
3) Draw neat sketches wherever necessary.  
4) Use of non programmable calculator is permitted.

**Section – I**

**Q.2 Solve any four** **16**

- Define kinetic energy correction factor ( $\alpha$ ) and momentum correction factor ( $\beta$ ) and derive their expressions.
- What do you understand by most economical channel section? and show that for trapezoidal section Half of top width = Length of one of sloping side and hydraulic mean depth = half the depth of flow.
- A 3.5 m wide rectangular channel convey's 10 m<sup>3</sup>/s of water with velocity 5 m/s. State is there formation of hydraulic jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water.
- Derive the modified GVF equation and draw a neat sketch and show all details.
- Derive the expression for Hydraulic Jump. Assume suitable data.

**Q.3 Solve any Two** **12**

- A hydraulic jump is formed in a 5.0 m wide rectangular channel carrying a discharge of 20 m<sup>3</sup>/sec. The pre jump depth is 0.5 m. Find the post jump depth, post jump Froude's number and energy loss in the jump.
- What is specific energy curve? Draw a neat sketch and show all details.
- A discharge of 800 m<sup>3</sup>/s flows down a spillway and then passes on a 55 m wide concrete apron ( $n = 0.012$ ) the velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m the channel below causes a hydraulic jump on the horizontal apron. Determine,
  - Depth before the jump
  - Length of jump
  - Energy loss in jump
  - Specific force at the toe

**Section – II**

**Q.4 Solve any four** **16**

- Write short notes on
  - Spurs
  - Meandering of river
- Design a regime channel by using 'Lacey's theory' from the data discharge = 50 m<sup>3</sup>/sec and silt factor = 1.12
- A model of water meter is tested in 110 mm diameter pipe. The discharge was 50 lit/sec and pressure difference is 0.10 N/mm<sup>2</sup>. What will be the discharge in pipe of 550 mm diameter pipe and what will be the pressure?

- d) What do you understand by river training works? Explain its types with examples.
- e) Draw a neat sketch of current meter and explain its working in details.

**Q.5 Solve any two****12**

- a) Oil of kinematic viscosity is  $5.5 \times 10^{-5} \text{ m}^2/\text{sec}$  is used in prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:9? Also find discharge ratio and time ratio for this model.
- b) Explain 'Similitude' and what are its types? and derive the equation for Froude's number.
- c) Design a regime channel by using 'Kennedy's Theory' using the following data
  - 1) Discharge  $40 \text{ m}^3/\text{sec}$
  - 2) Kutter's Coefficient ( $N=0.0022$ )
  - 3)  $m=1$ , side slope 0.5: 1, B/D 7.5 also find bed slope

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Set Q
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Open Channel Flow & River Hydraulics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The maximum velocity in open channel occurs at \_\_\_\_\_.  
 a) Near the channel bottom                      b) At the free surface  
 c) Little below the free surface                d) None
- 2) On what basis for designing the regime state is obtained?  
 a) Silt and Velocity of Flow                      b) Silt  
 c) Velocity    d) Depth of Channel
- 3) Whose theory was the first to provide semi-theoretical analysis of the problem of incipient condition of bed motion?  
 a) Lacey's theory                                      b) Kennedy's theory  
 c) Shield's theory                                    d) Strickler's equation
- 4) The Lacey's equation for a regime channel consists of a set of 'x' independent equation relating to flow, where 'x' is equal to \_\_\_\_\_.  
 a) 1    b) 3  
 c) 5    d) 8
- 5) River training work serves the following purposes:  
 a) Protect the river bed and banks  
 b) Direct the river flow in desired condition  
 c) Increase or decrease of the river discharge  
 d) Protect the surrounding land from flooding
- 6) The dimension of Kinematic viscosity is \_\_\_\_\_.  
 a)  $LT^{-2}$     b)  $L^2T^{-1}$   
 c)  $L^3T^{-1}$     d)  $LT^{-1}$
- 7) Kinematic similarity between model and prototype is the similarity of \_\_\_\_\_.  
 a) Discharge    b) Streamline pattern  
 c) Shape    d) Forces
- 8) At critical depth discharge is \_\_\_\_\_.  
 a) maximum for given specific energy  
 b) minimum for given specific energy  
 c) maximum for given specific force  
 d) minimum for given specific force

- 9) Uniform flow in open channel exists when the flow is steady and the channel is \_\_\_\_\_.  
a) Friction less  
b) Non prismatic  
c) Prismatic  
d) Prismatic and depth of flow is constant along the channel
- 10) If the Froude's number is 8.2 then the jump is known as \_\_\_\_\_.  
a) Steady  
b) Oscillating  
c) Undular  
d) none
- 11) Specific force represents the sum of pressure force and \_\_\_\_\_.  
a) Datum head  
b) Momentum flux per unit weight  
c) Momentum flux and datum head  
d) None
- 12) The flow in open channel may be characterized as laminar when \_\_\_\_\_.  
a)  $Re < 500$   
b)  $Re > 2000$   
c)  $Re > 4000$   
d)  $500 < Re < 2000$
- 13) For the trapezoidal section \_\_\_\_\_.  
a) Side slope equal to  $45^\circ$   
b) Depth of flow equal to half bed width  
c) Shape is of half hexagon  
d) None
- 14) River plains are made up of \_\_\_\_\_.  
a) Alluvium Black soil  
b) Red soil  
c) Black soil  
d) None



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Set Q
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Open Channel Flow & River Hydraulics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
2) All questions are compulsory.  
3) Draw neat sketches wherever necessary.  
4) Use of non programmable calculator is permitted.

**Section – I**

**Q.2 Solve any four** **16**

- Define kinetic energy correction factor ( $\alpha$ ) and momentum correction factor ( $\beta$ ) and derive their expressions.
- What do you understand by most economical channel section? and show that for trapezoidal section Half of top width = Length of one of sloping side and hydraulic mean depth = half the depth of flow.
- A 3.5 m wide rectangular channel convey's 10 m<sup>3</sup>/s of water with velocity 5 m/s. State is there formation of hydraulic jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water.
- Derive the modified GVF equation and draw a neat sketch and show all details.
- Derive the expression for Hydraulic Jump. Assume suitable data.

**Q.3 Solve any Two** **12**

- A hydraulic jump is formed in a 5.0 m wide rectangular channel carrying a discharge of 20 m<sup>3</sup>/sec. The pre jump depth is 0.5 m. Find the post jump depth, post jump Froude's number and energy loss in the jump.
- What is specific energy curve? Draw a neat sketch and show all details.
- A discharge of 800 m<sup>3</sup>/s flows down a spillway and then passes on a 55 m wide concrete apron ( $n = 0.012$ ) the velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m the channel below causes a hydraulic jump on the horizontal apron. Determine,
  - Depth before the jump
  - Length of jump
  - Energy loss in jump
  - Specific force at the toe

**Section – II**

**Q.4 Solve any four** **16**

- Write short notes on
  - Spurs
  - Meandering of river
- Design a regime channel by using 'Lacey's theory' from the data discharge = 50 m<sup>3</sup>/sec and silt factor = 1.12
- A model of water meter is tested in 110 mm diameter pipe. The discharge was 50 lit/sec and pressure difference is 0.10 N/mm<sup>2</sup>. What will be the discharge in pipe of 550 mm diameter pipe and what will be the pressure?

- d) What do you understand by river training works? Explain its types with examples.
- e) Draw a neat sketch of current meter and explain its working in details.

**Q.5 Solve any two****12**

- a) Oil of kinematic viscosity is  $5.5 \times 10^{-5} \text{ m}^2/\text{sec}$  is used in prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:9? Also find discharge ratio and time ratio for this model.
- b) Explain 'Similitude' and what are its types? and derive the equation for Froude's number.
- c) Design a regime channel by using 'Kennedy's Theory' using the following data
  - 1) Discharge  $40 \text{ m}^3/\text{sec}$
  - 2) Kutter's Coefficient ( $N=0.0022$ )
  - 3)  $m=1$ , side slope 0.5: 1, B/D 7.5 also find bed slope

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# Open Channel Flow & River Hydraulics

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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Marks: 14

14

- 1) The Lacey's equation for a regime channel consists of a set of 'x' independent equation relating to flow, where 'x' is equal to \_\_\_\_\_.  
a) 1  
b) 3  
c) 5  
d) 8
- 2) River training work serves the following purposes:  
a) Protect the river bed and banks  
b) Direct the river flow in desired condition  
c) Increase or decrease of the river discharge  
d) Protect the surrounding land from flooding
- 3) The dimension of Kinematic viscosity is \_\_\_\_\_.  
a)  $LT^{-2}$   
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c)  $L^3T^{-1}$   
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- 4) Kinematic similarity between model and prototype is the similarity of \_\_\_\_\_.  
a) Discharge  
b) Streamline pattern  
c) Shape  
d) Forces
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- 6) Uniform flow in open channel exists when the flow is steady and the channel is \_\_\_\_\_.  
a) Friction less  
b) Non prismatic  
c) Prismatic  
d) Prismatic and depth of flow is constant along the channel
- 7) If the Froude's number is 8.2 then the jump is known as \_\_\_\_\_.  
a) Steady  
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c) Undular  
d) none

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b) Silt  
c) Velocity  
d) Depth of Channel
- 14) Whose theory was the first to provide semi-theoretical analysis of the problem of incipient condition of bed motion?  
a) Lacey's theory  
b) Kennedy's theory  
c) Shield's theory  
d) Strickler's equation

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Open Channel Flow & River Hydraulics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
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**Section – I**

**Q.2 Solve any four** **16**

- Define kinetic energy correction factor ( $\alpha$ ) and momentum correction factor ( $\beta$ ) and derive their expressions.
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  - Depth before the jump
  - Length of jump
  - Energy loss in jump
  - Specific force at the toe

**Section – II**

**Q.4 Solve any four** **16**

- Write short notes on
  - Spurs
  - Meandering of river
- Design a regime channel by using 'Lacey's theory' from the data discharge = 50 m<sup>3</sup>/sec and silt factor = 1.12
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Open Channel Flow & River Hydraulics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) For the trapezoidal section \_\_\_\_\_.  
 a) Side slope equal to  $45^\circ$   
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 d) None
- 2) River plains are made up of \_\_\_\_\_.  
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 c) Black soil                                      d) None
- 3) The maximum velocity in open channel occurs at \_\_\_\_\_.  
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 a) Silt and Velocity of Flow                  b) Silt  
 c) Velocity    d) Depth of Channel
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- 13) Specific force represents the sum of pressure force and \_\_\_\_\_.
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  - b) Momentum flux per unit weight
  - c) Momentum flux and datum head
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- 14) The flow in open channel may be characterized as laminar when \_\_\_\_\_.
  - a)  $Re < 500$
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  - c)  $Re > 4000$
  - d)  $500 < Re < 2000$



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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Open Channel Flow & River Hydraulics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.  
 3) Draw neat sketches wherever necessary.  
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**Section – I**

**Q.2 Solve any four** **16**

- a) Define kinetic energy correction factor ( $\alpha$ ) and momentum correction factor ( $\beta$ ) and derive their expressions.
- b) What do you understand by most economical channel section? and show that for trapezoidal section Half of top width = Length of one of sloping side and hydraulic mean depth = half the depth of flow.
- c) A 3.5 m wide rectangular channel convey's 10 m<sup>3</sup>/s of water with velocity 5 m/s. State is there formation of hydraulic jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water.
- d) Derive the modified GVF equation and draw a neat sketch and show all details.
- e) Derive the expression for Hydraulic Jump. Assume suitable data.

**Q.3 Solve any Two** **12**

- a) A hydraulic jump is formed in a 5.0 m wide rectangular channel carrying a discharge of 20 m<sup>3</sup>/sec. The pre jump depth is 0.5 m. Find the post jump depth, post jump Froude's number and energy loss in the jump.
- b) What is specific energy curve? Draw a neat sketch and show all details.
- c) A discharge of 800 m<sup>3</sup>/s flows down a spillway and then passes on a 55 m wide concrete apron ( $n = 0.012$ ) the velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m the channel below causes a hydraulic jump on the horizontal apron. Determine,
  - 1) Depth before the jump
  - 2) Length of jump
  - 3) Energy loss in jump
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**Section – II**

**Q.4 Solve any four** **16**

- a) Write short notes on
  - 1) Spurs
  - 2) Meandering of river
- b) Design a regime channel by using 'Lacey's theory' from the data discharge = 50 m<sup>3</sup>/sec and silt factor = 1.12
- c) A model of water meter is tested in 110 mm diameter pipe. The discharge was 50 lit/sec and pressure difference is 0.10 N/mm<sup>2</sup>. What will be the discharge in pipe of 550 mm diameter pipe and what will be the pressure?

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- b) Explain 'Similitude' and what are its types? and derive the equation for Froude's number.
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  - 1) Discharge  $40 \text{ m}^3/\text{sec}$
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  - 3)  $m=1$ , side slope 0.5: 1, B/D 7.5 also find bed slope

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures- I**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark except MCQ. 13 which carry 2 marks.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) IS 456:2000 is not allowed while solving the MCQ.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) In reinforced cement concrete structures, the steel reinforcement consists of \_\_\_\_\_. **01**
  - a) Deformed bars
  - b) Cold twisted bars
  - c) Mild steel and medium tensile steel bars
  - d) All of these
- 2) The horizontal distance between parallel main reinforcement bars in a solid slab shall not be more than **01**
  - a) Two times the effective depth of solid slab or 300 mm whichever is less
  - b) Two times the effective depth of solid slab or 450 mm whichever is less
  - c) Three times the effective depth of solid slab or 300 mm whichever is less
  - d) Three times the effective depth of solid slab or 450 mm whichever is less
- 3) In an under-reinforced concrete beam **01**
  - a) actual depth of neutral axis is less than the critical depth of neutral axis
  - b) moment of resistance is less than that of balanced sections
  - c) both (a) and (b)
  - d) none of these
- 4) The side face reinforcement, if required in a T beam will be **01**
  - a) 0.1 % of the web area
  - b) 0.15% of the web area
  - c) 0.02 to 0.03% of the web area
  - d) Half of the longitudinal reinforcement
- 5) The width of the flange of the L-beam is taken as **01**
  - a) one-sixth of the effective span of L-beam
  - b) breadth of rib plus one-half of the clear distance between the rib
  - c) breadth of rib plus four times the thickness of the slab
  - d) minimum value of (a), (b) or (c)

- 6) The bending moment coefficient of a continuous beam at end supports for the dead load and live load is \_\_\_\_\_ of the effective span. **01**  
a)  $-1/10$  b)  $-1/12$   
c)  $1/10$  d)  $1/12$
- 7) According to IS 456:2000, the maximum compressive strain in concrete under axial compression is \_\_\_\_\_. **01**  
a) 0.0035 b) 0.002  
c) 0.0030 d) 0.0045
- 8) Columns may be made of plain concrete if their unsupported lengths do not exceed their least lateral dimension \_\_\_\_\_. **01**  
a) Two times b) Three times  
c) Four times d) Five times
- 9) The torsion resisting capacity of a given reinforced concrete section \_\_\_\_\_. **01**  
a) decreases with decrease in stirrup spacing  
b) decreases with increase in longitudinal bars  
c) does not depend upon stirrup and longitudinal steels  
d) increases with increase in stirrup and longitudinal steels
- 10) The longitudinal shearing stresses acting on the surface between the steel and concrete are called \_\_\_\_\_. **01**  
a) bond stresses b) tensile stresses  
c) compressive stresses d) None of these
- 11) A T beam behaves as a rectangular beam of a width equal to its flange if its neutral axis \_\_\_\_\_. **01**  
a) Falls within flange  
b) Falls below flange  
c) Coincides with the geometrical centre of beam  
d) Falls below the centroidal axis of the beam
- 12) In case of over reinforced section which element fails first \_\_\_\_\_. **01**  
a) Both steel and concrete simultaneously  
b) Neither steel or concrete  
c) Steel  
d) Concrete
- 13) The rectangular beam of width, 250 mm is having effective depth of 327 mm. The concrete grade is M20 and the grade of reinforcing steel is Fe415. As per limit state method, the lever arm in a balanced section is equal to \_\_\_\_\_. **02**  
a) 157mm b) 183mm  
c) 209mm d) 262mm

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Design of Concrete Structures- I**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 & 6 are compulsory  
2) Solve any two questions from question no. 3 to 5 in Section – I.  
3) Solve any two questions from question no. 7 to 9 in Section – II.  
4) Use of IS 456:2000 Original and non-programmable calculator is allowed.  
5) Assume suitable data if required and state it clearly.

**Section – I**

- Q.2** A rectangular section of effective size 300 mm x 500 mm effective subjected to a factored moment of 220 kNm. find the reinforcement required. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **08**
- Q.3** A hall has clear dimension 3m x 9m. with wall thickness 230mm. The live load on the slab is 3 kN/m<sup>2</sup> excluding floor finish. Use M<sub>20</sub> grade concrete and Fe<sub>500</sub> steel, design the slab. **10**
- Q.4** Design a rectangular beam of section 230mm x 600mm of effective span 6m. Effective cover for reinforcement should be kept as 50mm. Imposed load on the beam is 40 kN/m. Concrete used is M<sub>25</sub> and steel is Fe<sub>415</sub>. **10**
- Q.5** A T- beam slab floor has 125 mm thick slab forming part of T-beams which are of 8m clear span. The end bearings are 450 mm thick. Spacing of T- beams is 3.2 m. The live load on the floor is 3 kN/m<sup>2</sup>. Design one of the intermediate beam. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**

**Section – II**

- Q.6** Find the area of steel required for a short reinforced concrete column 400 mm x 400 mm to carry an axial load of 1000 kN. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **08**
- Q.7** Determine reinforcement required for a beam size 230 mm x 600 mm subjected to shear force of 60kN, torsional moment of 35 kN.m and bending moment of 80 kN.m. Use M<sub>20</sub> concrete and Fe<sub>500</sub> steel. **10**
- Q.8** Design a circular column of diameter 400 mm subjected to a load of 1300 kN. The column is having spiral ties. The column is 3 m long and is effectively held in position at both ends but not restrained against rotation. Use M<sub>25</sub> concrete and Fe<sub>415</sub> steel. **10**
- Q.9** Design a continuous rectangular beam of span 7 m to carry a dead load of 10 kN/m and a live load of 15 kN/m. The beam is continuous over more than 3 spans and is supported by columns. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**

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Set Q
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Concrete Structures- I**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark except MCQ. 13 which carry 2 marks.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) IS 456:2000 is not allowed while solving the MCQ.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

- Q.1 Choose the correct alternatives from the options.** **14**
- 1) Columns may be made of plain concrete if their unsupported lengths do not exceed their least lateral dimension \_\_\_\_\_. **01**
    - a) Two times
    - b) Three times
    - c) Four times
    - d) Five times
  - 2) The torsion resisting capacity of a given reinforced concrete section \_\_\_\_\_. **01**
    - a) decreases with decrease in stirrup spacing
    - b) decreases with increase in longitudinal bars
    - c) does not depend upon stirrup and longitudinal steels
    - d) increases with increase in stirrup and longitudinal steels
  - 3) The longitudinal shearing stresses acting on the surface between the steel and concrete are called \_\_\_\_\_. **01**
    - a) bond stresses
    - b) tensile stresses
    - c) compressive stresses
    - d) None of these
  - 4) A T beam behaves as a rectangular beam of a width equal to its flange if its neutral axis \_\_\_\_\_. **01**
    - a) Falls within flange
    - b) Falls below flange
    - c) Coincides with the geometrical centre of beam
    - d) Falls below the centroidal axis of the beam
  - 5) In case of over reinforced section which element fails first \_\_\_\_\_. **01**
    - a) Both steel and concrete simultaneously
    - b) Neither steel or concrete
    - c) Steel
    - d) Concrete
  - 6) In reinforced cement concrete structures, the steel reinforcement consists of \_\_\_\_\_. **01**
    - a) Deformed bars
    - b) Cold twisted bars
    - c) Mild steel and medium tensile steel bars
    - d) All of these

- 7) The horizontal distance between parallel main reinforcement bars in a solid slab shall not be more than **01**
- a) Two times the effective depth of solid slab or 300 mm whichever is less
  - b) Two times the effective depth of solid slab or 450 mm whichever is less
  - c) Three times the effective depth of solid slab or 300 mm whichever is less
  - d) Three times the effective depth of solid slab or 450 mm whichever is less
- 8) In an under-reinforced concrete beam **01**
- a) actual depth of neutral axis is less than the critical depth of neutral axis
  - b) moment of resistance is less than that of balanced sections
  - c) both (a) and (b)
  - d) none of these
- 9) The side face reinforcement, if required in a T beam will be **01**
- a) 0.1 % of the web area
  - b) 0.15% of the web area
  - c) 0.02 to 0.03% of the web area
  - d) Half of the longitudinal reinforcement
- 10) The width of the flange of the L-beam is taken as **01**
- a) one-sixth of the effective span of L-beam
  - b) breadth of rib plus one-half of the clear distance between the rib
  - c) breadth of rib plus four times the thickness of the slab
  - d) minimum value of (a), (b) or (c)
- 11) The bending moment coefficient of a continuous beam at end supports for the dead load and live load is \_\_\_\_\_ of the effective span. **01**
- a)  $-1/10$
  - b)  $-1/12$
  - c)  $1/10$
  - d)  $1/12$
- 12) According to IS 456:2000, the maximum compressive strain in concrete under axial compression is \_\_\_\_\_. **01**
- a) 0.0035
  - b) 0.002
  - c) 0.0030
  - d) 0.0045
- 13) The rectangular beam of width, 250 mm is having effective depth of 327 mm. The concrete grade is M20 and the grade of reinforcing steel is Fe415. As per limit state method, the lever arm in a balanced section is equal to \_\_\_\_\_. **02**
- a) 157mm
  - b) 183mm
  - c) 209mm
  - d) 262mm

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Set Q
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Design of Concrete Structures- I**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 & 6 are compulsory  
 2) Solve any two questions from question no. 3 to 5 in Section – I.  
 3) Solve any two questions from question no. 7 to 9 in Section – II.  
 4) Use of IS 456:2000 Original and non-programmable calculator is allowed.  
 5) Assume suitable data if required and state it clearly.

**Section – I**

- Q.2** A rectangular section of effective size 300 mm x 500 mm effective subjected to a factored moment of 220 kNm. find the reinforcement required. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **08**
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**Section – II**

- Q.6** Find the area of steel required for a short reinforced concrete column 400 mm x 400 mm to carry an axial load of 1000 kN. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **08**
- Q.7** Determine reinforcement required for a beam size 230 mm x 600 mm subjected to shear force of 60kN, torsional moment of 35 kN.m and bending moment of 80 kN.m. Use M<sub>20</sub> concrete and Fe<sub>500</sub> steel. **10**
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures- I**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark except MCQ. 13 which carry 2 marks.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) A T beam behaves as a rectangular beam of a width equal to its flange if its neutral axis \_\_\_\_\_. **01**
  - a) Falls within flange
  - b) Falls below flange
  - c) Coincides with the geometrical centre of beam
  - d) Falls below the centroidal axis of the beam
- 2) In case of over reinforced section which element fails first \_\_\_\_\_. **01**
  - a) Both steel and concrete simultaneously
  - b) Neither steel or concrete
  - c) Steel
  - d) Concrete
- 3) In reinforced cement concrete structures, the steel reinforcement consists of \_\_\_\_\_. **01**
  - a) Deformed bars
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- 4) The horizontal distance between parallel main reinforcement bars in a solid slab shall not be more than \_\_\_\_\_. **01**
  - a) Two times the effective depth of solid slab or 300 mm whichever is less
  - b) Two times the effective depth of solid slab or 450 mm whichever is less
  - c) Three times the effective depth of solid slab or 300 mm whichever is less
  - d) Three times the effective depth of solid slab or 450 mm whichever is less
- 5) In an under-reinforced concrete beam \_\_\_\_\_. **01**
  - a) actual depth of neutral axis is less than the critical depth of neutral axis
  - b) moment of resistance is less than that of balanced sections
  - c) both (a) and (b)
  - d) none of these

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Design of Concrete Structures- I**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 & 6 are compulsory  
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures- I**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark except MCQ. 13 which carry 2 marks.  
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Duration: 30 Minutes

Marks: 14

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- 12) The width of the flange of the L-beam is taken as **01**  
a) one-sixth of the effective span of L-beam  
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c) breadth of rib plus four times the thickness of the slab  
d) minimum value of (a), (b) or (c)
- 13) The rectangular beam of width, 250 mm is having effective depth of 327 mm. The concrete grade is M20 and the grade of reinforcing steel is Fe415. As per limit state method, the lever arm in a balanced section is equal to \_\_\_\_\_. **02**  
a) 157mm  
b) 183mm  
c) 209mm  
d) 262mm

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Design of Concrete Structures- I**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. No. 2 & 6 are compulsory  
 2) Solve any two questions from question no. 3 to 5 in Section – I.  
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**Section – I**

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**Section – II**

- Q.6** Find the area of steel required for a short reinforced concrete column 400 mm x 400 mm to carry an axial load of 1000 kN. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **08**
- Q.7** Determine reinforcement required for a beam size 230 mm x 600 mm subjected to shear force of 60kN, torsional moment of 35 kN.m and bending moment of 80 kN.m. Use M<sub>20</sub> concrete and Fe<sub>500</sub> steel. **10**
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## Principles of Management and Quantitative Techniques

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) MBO is developed by \_\_\_\_\_.  
a) Gilberth                                      b) Peter Drucker  
c) Fayol    d) Taylor
- 2) F.W. Taylor introduced \_\_\_\_\_.  
a) Line organization                            b) Line & staff organization  
c) Functional organization                 d) Effective organization
- 3) Simplex method is the method used for \_\_\_\_\_.  
a) value analysis                                b) network analysis  
c) linear programming                        d) queuing theory
- 4) Transportation problem can be solved if \_\_\_\_\_.  
a) No. of rows = no. of columns            b) No. of rows  $\geq$  no. of columns  
c) No. of rows  $\leq$  no. of columns            d) All of these
- 5) Hungarian trial and error method is suitable for solving \_\_\_\_\_.  
a) Transportation problem                    b) Assignment problem  
c) Games theory                                d) Simplex method
- 6) Decision making under risk is \_\_\_\_\_.  
a) Deterministic                                b) Probabilistic  
c) Uncertain                                      d) None of these
- 7) Games without a saddle point require players to play \_\_\_\_\_.  
a) Pure strategy                                 b) Mixed strategy  
c) Market strategy                              d) None of these
- 8) In ABC analysis least monitoring and control is required for \_\_\_\_\_.  
a) A class items                                 b) B class items  
c) C class items                                 d) All of these
- 9) The cost of keeping items in inventory is called \_\_\_\_\_.  
a) Set up cost                                    b) Holding cost  
c) Shortage cos                                 d) None of these
- 10) EOQ model helps to find \_\_\_\_\_.  
a) Optimum size of order                      b) Time interval between order  
c) Both (a) and (b)                            d) None of these

- 11)** What is at the heart of any ERP?
- |                |              |
|----------------|--------------|
| a) Information | b) Employees |
| c) Customers   | d) Database  |
- 12)** Break even analysis consists of \_\_\_\_\_.  
a) fixed expenses                      b) variable cost  
c) sales revenue                        d) All of these
- 13)** Average Chart and Range Chart is used for \_\_\_\_\_.  
a) Attributes                              b) Variables  
c) Both (a) and (b)                      d) none
- 14)** The percent of the sample means will have values that are within  $\pm 3$  standard deviations of the distribution mean is \_\_\_\_\_.  
a) 95.5                                      b) 96.7  
c) 97.6                                      d) 99.7



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Set **P**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Principles of Management and Quantitative Techniques**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

**08**

- a) Enlist and write a note on the “Function of Management”.  
 b) A firm produces three products. These products are processed on three different machines. The time required to manufacture one of each of the three products and the daily capacity of three machines is given in the table below:

Machine	Time per unit (minutes)			Machine capacity (minutes/day)
M1	2	3	2	440
M2	4	—	3	470
M3	2	5	—	430

Formulate the above data in LPP which is required to determine the daily number of units to be manufactured for each product. The profit per units for product 1, 2 and 3 is Rs. 40/-, Rs. 30/- and Rs. 60/- respectively.

**Q.3 Attempt the following question.**

**06**

- a) Use Simplex Method to solve the following LPP.

$$\text{Max. } Z = 6x_1 + 8x_2$$

Subject to

$$30x_1 + 20x_2 \leq 300$$

$$5x_1 + 10x_2 \leq 110$$

$$x_1, x_2 \geq 0$$

- b) Find the initial basic feasible solution by Least Cost Method.

**04**

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

**Q.4 Attempt below question.**

- a) A company is bringing out a new product in market with three strategy of production line like full, partial and minimal. The state of nature may be Good demand, fair demand and poor demand with following payoff of profit as shown in table below:

**03**

State of Nature (Demand)	Production Line		
	Full	Partial	Minimal
Good	80	70	50
Fair	50	45	40
Poor	-25	-10	0

Take optimal decision under each of the following decision rules:

- 1) Maximax
- 2) Maximin
- 3) Laplace

- b) Construct the dual to the primal problem:

**03**

$$\text{Max. } Z = 3x_1 + 5x_2$$

Subject to

$$2x_1 + 6x_2 \leq 50$$

$$3x_1 + 2x_2 \leq 35$$

$$5x_1 - 3x_2 \leq 10$$

$$-x_2 \geq -20$$

$$x_1, x_2 \geq 0$$

- c) Find the Saddle Point using the dominance rule.

**04**

		Player B		
		B1	B2	B3
Player A	A1	5	9	3
	A2	6	-12	-11
	A3	8	16	10

**Section – II****Q.5 Attempt above question.**

- a) Explain in brief about “Inventory and cost associated with Inventory” along with objective of Inventory management?
- b) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory cost is Rs. 30/- and procurement cost per order is Rs. 500/-  
Find economic order quantity and number of order to be placed per month?

**06****04****Q.6 Attempt above question**

- a) Explain in brief “ERP” system and its use in Civil construction sector.
- b) Explain in brief various technical terms of “Break Even Analysis” with neat sketch.

**04****05**

**Q.7 Attempt above question**

- a) Explain in brief “Importance of Quality Control Technique in construction sector”? **04**
- b) Construct X Control Chart using following data as given below:  $A_2 = 0.58$  **05**

	Sample Observation				
Sample No.	I	II	III	IV	V
1	42	65	75	81	87
2	42	45	68	70	90
3	19	24	80	81	81
4	36	54	69	77	84
5	42	51	60	59	78

<b>Seat No.</b>	
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# Principles of Management and Quantitative Techniques

Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

- 1) In ABC analysis least monitoring and control is required for \_\_\_\_\_.  
a) A class items                                      b) B class items  
c) C class items                                      d) All of these
- 2) The cost of keeping items in inventory is called \_\_\_\_\_.  
a) Set up cost    b) Holding cost  
c) Shortage cos                                        d) None of these
- 3) EOQ model helps to find \_\_\_\_\_.  
a) Optimum size of order                          b) Time interval between order  
c) Both (a) and (b)                                 d) None of these
- 4) What is at the heart of any ERP?  
a) Information    b) Employees  
c) Customers    d) Database
- 5) Break even analysis consists of \_\_\_\_\_.  
a) fixed expenses                                    b) variable cost  
c) sales revenue                                      d) All of these
- 6) Average Chart and Range Chart is used for \_\_\_\_\_.  
a) Attributes    b) Variables  
c) Both (a) and (b)                                 d) none
- 7) The percent of the sample means will have values that are within  $\pm 3$  standard deviations of the distribution mean is \_\_\_\_\_.  
a) 95.5    b) 96.7  
c) 97.6    d) 99.7
- 8) MBO is developed by \_\_\_\_\_.  
a) Gilberth    b) Peter Drucker  
c) Fayol     d) Taylor
- 9) F.W. Taylor introduced \_\_\_\_\_.  
a) Line organization                                 b) Line & staff organization  
c) Functional organization                        d) Effective organization

- 10)** Simplex method is the method used for \_\_\_\_\_.  
a) value analysis                      b) network analysis  
c) linear programming                d) queuing theory
- 11)** Transportation problem can be solved if \_\_\_\_\_.  
a) No. of rows = no. of columns    b) No. of rows  $\geq$  no. of columns  
c) No. of rows  $\leq$  no. of columns    d) All of these
- 12)** Hungarian trial and error method is suitable for solving \_\_\_\_\_.  
a) Transportation problem            b) Assignment problem  
c) Games theory                        d) Simplex method
- 13)** Decision making under risk is \_\_\_\_\_.  
a) Deterministic                        b) Probabilistic  
c) Uncertain                              d) None of these
- 14)** Games without a saddle point require players to play \_\_\_\_\_.  
a) Pure strategy                        b) Mixed strategy  
c) Market strategy                      d) None of these

Seat No.	
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Set **Q**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Principles of Management and Quantitative Techniques**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

**08**

- a) Enlist and write a note on the “Function of Management”.  
 b) A firm produces three products. These products are processed on three different machines. The time required to manufacture one of each of the three products and the daily capacity of three machines is given in the table below:

Machine	Time per unit (minutes)			Machine capacity (minutes/day)
M1	2	3	2	440
M2	4	—	3	470
M3	2	5	—	430

Formulate the above data in LPP which is required to determine the daily number of units to be manufactured for each product. The profit per units for product 1, 2 and 3 is Rs. 40/-, Rs. 30/- and Rs. 60/- respectively.

**Q.3 Attempt the following question.**

**06**

- a) Use Simplex Method to solve the following LPP.

$$\text{Max. } Z = 6x_1 + 8x_2$$

Subject to

$$30x_1 + 20x_2 \leq 300$$

$$5x_1 + 10x_2 \leq 110$$

$$x_1, x_2 \geq 0$$

- b) Find the initial basic feasible solution by Least Cost Method.

**04**

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

**Q.4 Attempt below question.**

- a) A company is bringing out a new product in market with three strategy of production line like full, partial and minimal. The state of nature may be Good demand, fair demand and poor demand with following payoff of profit as shown in table below:

**03**

State of Nature (Demand)	Production Line		
	Full	Partial	Minimal
Good	80	70	50
Fair	50	45	40
Poor	-25	-10	0

Take optimal decision under each of the following decision rules:

- 1) Maximax
- 2) Maximin
- 3) Laplace

- b) Construct the dual to the primal problem:

**03**

$$\text{Max. } Z = 3x_1 + 5x_2$$

Subject to

$$2x_1 + 6x_2 \leq 50$$

$$3x_1 + 2x_2 \leq 35$$

$$5x_1 - 3x_2 \leq 10$$

$$-x_2 \geq -20$$

$$x_1, x_2 \geq 0$$

- c) Find the Saddle Point using the dominance rule.

**04**

		Player B		
		B1	B2	B3
Player A	A1	5	9	3
	A2	6	-12	-11
	A3	8	16	10

**Section – II****Q.5 Attempt above question.**

- a) Explain in brief about “Inventory and cost associated with Inventory” along with objective of Inventory management?
- b) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory cost is Rs. 30/- and procurement cost per order is Rs. 500/-  
Find economic order quantity and number of order to be placed per month?

**06****04****Q.6 Attempt above question**

- a) Explain in brief “ERP” system and its use in Civil construction sector.
- b) Explain in brief various technical terms of “Break Even Analysis” with neat sketch.

**04****05**

**Q.7 Attempt above question**

- a) Explain in brief “Importance of Quality Control Technique in construction sector”? **04**
- b) Construct X Control Chart using following data as given below:  $A_2 = 0.58$  **05**

	Sample Observation				
Sample No.	I	II	III	IV	V
1	42	65	75	81	87
2	42	45	68	70	90
3	19	24	80	81	81
4	36	54	69	77	84
5	42	51	60	59	78



Seat No.	
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Set R
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Principles of Management and Quantitative Techniques**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) What is at the heart of any ERP?
 

a) Information	b) Employees
c) Customers	d) Database
- 2) Break even analysis consists of \_\_\_\_\_.
 

a) fixed expenses	b) variable cost
c) sales revenue	d) All of these
- 3) Average Chart and Range Chart is used for \_\_\_\_\_.
 

a) Attributes	b) Variables
c) Both (a) and (b)	d) none
- 4) The percent of the sample means will have values that are within  $\pm 3$  standard deviations of the distribution mean is \_\_\_\_\_.
 

a) 95.5	b) 96.7
c) 97.6	d) 99.7
- 5) MBO is developed by \_\_\_\_\_.
 

a) Gilberth	b) Peter Drucker
c) Fayol	d) Taylor
- 6) F.W. Taylor introduced \_\_\_\_\_.
 

a) Line organization	b) Line & staff organization
c) Functional organization	d) Effective organization
- 7) Simplex method is the method used for \_\_\_\_\_.
 

a) value analysis	b) network analysis
c) linear programming	d) queuing theory
- 8) Transportation problem can be solved if \_\_\_\_\_.
 

a) No. of rows = no. of columns	b) No. of rows $\geq$ no. of columns
c) No. of rows $\leq$ no. of columns	d) All of these
- 9) Hungarian trial and error method is suitable for solving \_\_\_\_\_.
 

a) Transportation problem	b) Assignment problem
c) Games theory	d) Simplex method

- 10) Decision making under risk is \_\_\_\_\_.
  - a) Deterministic
  - b) Probabilistic
  - c) Uncertain
  - d) None of these
- 11) Games without a saddle point require players to play \_\_\_\_\_.
  - a) Pure strategy
  - b) Mixed strategy
  - c) Market strategy
  - d) None of these
- 12) In ABC analysis least monitoring and control is required for \_\_\_\_\_.
  - a) A class items
  - b) B class items
  - c) C class items
  - d) All of these
- 13) The cost of keeping items in inventory is called \_\_\_\_\_.
  - a) Set up cost
  - b) Holding cost
  - c) Shortage cost
  - d) None of these
- 14) EOQ model helps to find \_\_\_\_\_.
  - a) Optimum size of order
  - b) Time interval between order
  - c) Both (a) and (b)
  - d) None of these

Seat No.	
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Set **R**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Principles of Management and Quantitative Techniques**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

**08**

- a) Enlist and write a note on the “Function of Management”.  
 b) A firm produces three products. These products are processed on three different machines. The time required to manufacture one of each of the three products and the daily capacity of three machines is given in the table below:

Machine	Time per unit (minutes)			Machine capacity (minutes/day)
M1	2	3	2	440
M2	4	—	3	470
M3	2	5	—	430

Formulate the above data in LPP which is required to determine the daily number of units to be manufactured for each product. The profit per units for product 1, 2 and 3 is Rs. 40/-, Rs. 30/- and Rs. 60/- respectively.

**Q.3 Attempt the following question.**

- a) Use Simplex Method to solve the following LPP.

**06**

$$\text{Max. } Z = 6x_1 + 8x_2$$

Subject to

$$30x_1 + 20x_2 \leq 300$$

$$5x_1 + 10x_2 \leq 110$$

$$x_1, x_2 \geq 0$$

- b) Find the initial basic feasible solution by Least Cost Method.

**04**

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

**Q.4 Attempt below question.**

- a) A company is bringing out a new product in market with three strategy of production line like full, partial and minimal. The state of nature may be Good demand, fair demand and poor demand with following payoff of profit as shown in table below:

**03**

State of Nature (Demand)	Production Line		
	Full	Partial	Minimal
Good	80	70	50
Fair	50	45	40
Poor	-25	-10	0

Take optimal decision under each of the following decision rules:

- 1) Maximax
- 2) Maximin
- 3) Laplace

- b) Construct the dual to the primal problem:

**03**

$$\text{Max. } Z = 3x_1 + 5x_2$$

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$$3x_1 + 2x_2 \leq 35$$

$$5x_1 - 3x_2 \leq 10$$

$$-x_2 \geq -20$$

$$x_1, x_2 \geq 0$$

- c) Find the Saddle Point using the dominance rule.

**04**

		Player B		
		B1	B2	B3
Player A	A1	5	9	3
	A2	6	-12	-11
	A3	8	16	10

**Section – II****Q.5 Attempt above question.**

- a) Explain in brief about “Inventory and cost associated with Inventory” along with objective of Inventory management?

**06**

- b) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory cost is Rs. 30/- and procurement cost per order is Rs. 500/-

**04**

Find economic order quantity and number of order to be placed per month?

**Q.6 Attempt above question**

- a) Explain in brief “ERP” system and its use in Civil construction sector.
- b) Explain in brief various technical terms of “Break Even Analysis” with neat sketch.

**04****05**

**Q.7 Attempt above question**

- a) Explain in brief “Importance of Quality Control Technique in construction sector”? **04**
- b) Construct X Control Chart using following data as given below:  $A_2 = 0.58$  **05**

	Sample Observation				
Sample No.	I	II	III	IV	V
1	42	65	75	81	87
2	42	45	68	70	90
3	19	24	80	81	81
4	36	54	69	77	84
5	42	51	60	59	78

<b>Seat No.</b>	
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## Principles of Management and Quantitative Techniques

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Decision making under risk is \_\_\_\_\_.  
a) Deterministic                      b) Probabilistic  
c) Uncertain                          d) None of these
- 2) Games without a saddle point require players to play \_\_\_\_\_.  
a) Pure strategy                      b) Mixed strategy  
c) Market strategy                  d) None of these
- 3) In ABC analysis least monitoring and control is required for \_\_\_\_\_.  
a) A class items                      b) B class items  
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a) Set up cost                        b) Holding cost  
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- 5) EOQ model helps to find \_\_\_\_\_.  
a) Optimum size of order            b) Time interval between order  
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- 6) What is at the heart of any ERP?  
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- 7) Break even analysis consists of \_\_\_\_\_.  
a) fixed expenses                    b) variable cost  
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- 8) Average Chart and Range Chart is used for \_\_\_\_\_.  
a) Attributes                         b) Variables  
c) Both (a) and (b)                  d) none
- 9) The percent of the sample means will have values that are within  $\pm 3$  standard deviations of the distribution mean is \_\_\_\_\_.  
a) 95.5                                  b) 96.7  
c) 97.6                                  d) 99.7

- 10)** MBO is developed by \_\_\_\_\_.  
a) Gilberth                      b) Peter Drucker  
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- 12)** Simplex method is the method used for \_\_\_\_\_.  
a) value analysis                b) network analysis  
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- 13)** Transportation problem can be solved if \_\_\_\_\_.  
a) No. of rows = no. of columns    b) No. of rows  $\geq$  no. of columns  
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- 14)** Hungarian trial and error method is suitable for solving \_\_\_\_\_.  
a) Transportation problem        b) Assignment problem  
c) Games theory                    d) Simplex method

Seat No.	
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Set **S**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Principles of Management and Quantitative Techniques**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

**08**

- a) Enlist and write a note on the “Function of Management”.  
 b) A firm produces three products. These products are processed on three different machines. The time required to manufacture one of each of the three products and the daily capacity of three machines is given in the table below:

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M1	2	3	2	440
M2	4	—	3	470
M3	2	5	—	430

Formulate the above data in LPP which is required to determine the daily number of units to be manufactured for each product. The profit per units for product 1, 2 and 3 is Rs. 40/-, Rs. 30/- and Rs. 60/- respectively.

**Q.3 Attempt the following question.**

**06**

- a) Use Simplex Method to solve the following LPP.

$$\text{Max. } Z = 6x_1 + 8x_2$$

Subject to

$$30x_1 + 20x_2 \leq 300$$

$$5x_1 + 10x_2 \leq 110$$

$$x_1, x_2 \geq 0$$

- b) Find the initial basic feasible solution by Least Cost Method.

**04**

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	



**Q.4 Attempt below question.**

- a) A company is bringing out a new product in market with three strategy of production line like full, partial and minimal. The state of nature may be Good demand, fair demand and poor demand with following payoff of profit as shown in table below:

**03**

State of Nature (Demand)	Production Line		
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Take optimal decision under each of the following decision rules:

- 1) Maximax
- 2) Maximin
- 3) Laplace

- b) Construct the dual to the primal problem:

**03**

$$\text{Max. } Z = 3x_1 + 5x_2$$

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$$5x_1 - 3x_2 \leq 10$$

$$-x_2 \geq -20$$

$$x_1, x_2 \geq 0$$

- c) Find the Saddle Point using the dominance rule.

**04**

		Player B		
		B1	B2	B3
Player A	A1	5	9	3
	A2	6	-12	-11
	A3	8	16	10

**Section – II****Q.5 Attempt above question.**

- a) Explain in brief about “Inventory and cost associated with Inventory” along with objective of Inventory management?
- b) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory cost is Rs. 30/- and procurement cost per order is Rs. 500/-  
Find economic order quantity and number of order to be placed per month?

**06****04****Q.6 Attempt above question**

- a) Explain in brief “ERP” system and its use in Civil construction sector.
- b) Explain in brief various technical terms of “Break Even Analysis” with neat sketch.

**04****05**

**Q.7 Attempt above question**

- a) Explain in brief “Importance of Quality Control Technique in construction sector”? **04**
- b) Construct X Control Chart using following data as given below:  $A_2 = 0.58$  **05**

	Sample Observation				
Sample No.	I	II	III	IV	V
1	42	65	75	81	87
2	42	45	68	70	90
3	19	24	80	81	81
4	36	54	69	77	84
5	42	51	60	59	78

**Seat  
No.**

## Geosynthetics and Reinforced Soil Structures

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

Marks: 10

**10**

- 1) The modern concept of reinforced earth was invented by \_\_\_\_\_.  
a) Terzaghi                                      b) Skempton  
c) Henri Vidal                                  d) Bjerrum
- 2) Why is carbon black added to geosynthetic?  
a) To increase tensile strength  
b) To reduce the effect of exposure to ultra violet rays  
c) To protect from biological degradation  
d) All of the above
- 3) What is the core of GCL made of \_\_\_\_\_.  
a) Thick non-woven geotextile        b) Bentonite clay  
c) Kaolinite clay                             d) Corrugated plastic sheet
- 4) In a PVD section which parts acts as a drainage medium \_\_\_\_\_.  
a) Geotextile                                    b) Cover Inner Core  
c) Both of the above                        d) None of the above
- 5) Which is the monomer of PVC \_\_\_\_\_.  
a) Nylon    b) Ethylene  
c) Vinyl chloride                              d) Teflon
- 6) The width of grips for performing the grab tensile strength is \_\_\_\_\_.  
a) 76 mm                                        b) 25 mm  
c) 50 mm                                        d) 200 mm
- 7) The result of the dynamic puncture test is reported in units of \_\_\_\_\_.  
a) kilo    b) Newtons Newtons  
c) mm    d) kPa
- 8) What are the hydraulic properties of geosynthetics?  
a) Gradient ratio                                b) Permittivity  
c) Transmissivity                                d) All the above

- 9)** What is abrasion resistance?
- a) It is the strip tensile strength of an abraded specimen
  - b) It is the wide width tensile strength of the abraded specimen
  - c) It is the ratio of the tensile strength of the abraded specimen to that of virgin specimen
  - d) It is the ratio of the tensile strength of the virgin specimen and the abraded specimen
- 10)** What are the disadvantages of reinforced concrete retaining walls?
- a) Construction height is limited due to practical reasons
  - b) Long construction times
  - c) Self-weight is so high that foundation should be strong
  - d) All of the above

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Geosynthetics and Reinforced Soil Structures**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any Eight questions.  
2) Figures to the right indicate full marks.

- |             |  |           |
|-------------|--|-----------|
| <b>Q.2</b>  | What is Geosynthetic? Explain advantages of geosynthetics.   | <b>05</b> |
| <b>Q.3</b>  | List out different types of Geosynthetics. Explain any four.   | <b>05</b> |
| <b>Q.4</b>  | Explain in detail Erosion Control. What are the different types of erosion forces & List different Protection Systems. | <b>05</b> |
| <b>Q.5</b>  | What is Landfill? Explain role of Geosynthetics in Landfills.  | <b>05</b> |
| <b>Q.6</b>  | What are the concepts of reinforced soil?  | <b>05</b> |
| <b>Q.7</b>  | What are the mechanical properties of geosynthetics?   | <b>05</b> |
| <b>Q.8</b>  | What is Embankment/Slope? Draw different failure modes of embankments.   | <b>05</b> |
| <b>Q.9</b>  | Explain in detail Pavement applications of Geosynthetics.  | <b>05</b> |
| <b>Q.10</b> | Write in detail functions of geosynthetics.  | <b>05</b> |
| <b>Q.11</b> | How are impact and abrasion test conducted?  | <b>05</b> |

Set	Q
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- 8)** What is the core of GCL made of \_\_\_\_\_.  
a) Thick non-woven geotextile      b) Bentonite clay  
c) Kaolinite clay                      d) Corrugated plastic sheet
- 9)** In a PVD section which parts acts as a drainage medium \_\_\_\_\_.  
a) Geotextile                              b) Cover Inner Core  
c) Both of the above                      d) None of the above
- 10)** Which is the monomer of PVC \_\_\_\_\_.  
a) Nylon                                      b) Ethylene  
c) Vinyl chloride                              d) Teflon

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Geosynthetics and Reinforced Soil Structures**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any Eight questions.  
2) Figures to the right indicate full marks.

- |             |  |           |
|-------------|--|-----------|
| <b>Q.2</b>  | What is Geosynthetic? Explain advantages of geosynthetics.   | <b>05</b> |
| <b>Q.3</b>  | List out different types of Geosynthetics. Explain any four.   | <b>05</b> |
| <b>Q.4</b>  | Explain in detail Erosion Control. What are the different types of erosion forces & List different Protection Systems. | <b>05</b> |
| <b>Q.5</b>  | What is Landfill? Explain role of Geosynthetics in Landfills.  | <b>05</b> |
| <b>Q.6</b>  | What are the concepts of reinforced soil?  | <b>05</b> |
| <b>Q.7</b>  | What are the mechanical properties of geosynthetics?   | <b>05</b> |
| <b>Q.8</b>  | What is Embankment/Slope? Draw different failure modes of embankments.   | <b>05</b> |
| <b>Q.9</b>  | Explain in detail Pavement applications of Geosynthetics.  | <b>05</b> |
| <b>Q.10</b> | Write in detail functions of geosynthetics.  | <b>05</b> |
| <b>Q.11</b> | How are impact and abrasion test conducted?  | <b>05</b> |



<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Geosynthetics and Reinforced Soil Structures**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternative from the given option.**

**10**

- 1) What is abrasion resistance?
  - a) It is the strip tensile strength of an abraded specimen
  - b) It is the wide width tensile strength of the abraded specimen
  - c) It is the ratio of the tensile strength of the abraded specimen to that of virgin specimen
  - d) It is the ratio of the tensile strength of the virgin specimen and the abraded specimen
- 2) What are the disadvantages of reinforced concrete retaining walls?
  - a) Construction height is limited due to practical reasons
  - b) Long construction times
  - c) Self-weight is so high that foundation should be strong
  - d) All of the above
- 3) The modern concept of reinforced earth was invented by \_\_\_\_\_.
  - a) Terzaghi
  - b) Skempton
  - c) Henri Vidal
  - d) Bjerrum
- 4) Why is carbon black added to geosynthetic?
  - a) To increase tensile strength
  - b) To reduce the effect of exposure to ultra violet rays
  - c) To protect from biological degradation
  - d) All of the above
- 5) What is the core of GCL made of \_\_\_\_\_.
  - a) Thick non-woven geotextile
  - b) Bentonite clay
  - c) Kaolinite clay
  - d) Corrugated plastic sheet
- 6) In a PVD section which parts acts as a drainage medium \_\_\_\_\_.
  - a) Geotextile
  - b) Cover Inner Core
  - c) Both of the above
  - d) None of the above
- 7) Which is the monomer of PVC \_\_\_\_\_.
  - a) Nylon
  - b) Ethylene
  - c) Vinyl chloride
  - d) Teflon

- 8)** The width of grips for performing the grab tensile strength is \_\_\_\_\_.  
a) 76 mm                                      b) 25 mm  
c) 50 mm                                      d) 200 mm
- 9)** The result of the dynamic puncture test is reported in units of \_\_\_\_\_.  
a) kilo    b) Newtons Newtons  
c) mm    d) kPa
- 10)** What are the hydraulic properties of geosynthetics?  
a) Gradient ratio                                      b) Permittivity  
c) Transmissivity                                      d) All the above

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Geosynthetics and Reinforced Soil Structures**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any Eight questions.  
2) Figures to the right indicate full marks.

- |             |  |           |
|-------------|--|-----------|
| <b>Q.2</b>  | What is Geosynthetic? Explain advantages of geosynthetics.   | <b>05</b> |
| <b>Q.3</b>  | List out different types of Geosynthetics. Explain any four.   | <b>05</b> |
| <b>Q.4</b>  | Explain in detail Erosion Control. What are the different types of erosion forces & List different Protection Systems. | <b>05</b> |
| <b>Q.5</b>  | What is Landfill? Explain role of Geosynthetics in Landfills.  | <b>05</b> |
| <b>Q.6</b>  | What are the concepts of reinforced soil?  | <b>05</b> |
| <b>Q.7</b>  | What are the mechanical properties of geosynthetics?   | <b>05</b> |
| <b>Q.8</b>  | What is Embankment/Slope? Draw different failure modes of embankments.   | <b>05</b> |
| <b>Q.9</b>  | Explain in detail Pavement applications of Geosynthetics.  | <b>05</b> |
| <b>Q.10</b> | Write in detail functions of geosynthetics.  | <b>05</b> |
| <b>Q.11</b> | How are impact and abrasion test conducted?  | <b>05</b> |

Seat No.	
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Set **S**

**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Geosynthetics and Reinforced Soil Structures**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternative from the given option.**

**10**

- 1) What is the core of GCL made of \_\_\_\_\_.  
 a) Thick non-woven geotextile      b) Bentonite clay  
 c) Kaolinite clay                      d) Corrugated plastic sheet
- 2) In a PVD section which parts acts as a drainage medium \_\_\_\_\_.  
 a) Geotextile                              b) Cover Inner Core  
 c) Both of the above                      d) None of the above
- 3) Which is the monomer of PVC \_\_\_\_\_.  
 a) Nylon                                      b) Ethylene  
 c) Vinyl chloride                          d) Teflon
- 4) The width of grips for performing the grab tensile strength is \_\_\_\_\_.  
 a) 76 mm                                      b) 25 mm  
 c) 50 mm                                      d) 200 mm
- 5) The result of the dynamic puncture test is reported in units of \_\_\_\_\_.  
 a) kilo    b) Newtons Newtons  
 c) mm    d) kPa
- 6) What are the hydraulic properties of geosynthetics?  
 a) Gradient ratio                              b) Permittivity  
 c) Transmissivity                              d) All the above
- 7) What is abrasion resistance?  
 a) It is the strip tensile strength of an abraded specimen  
 b) It is the wide width tensile strength of the abraded specimen  
 c) It is the ratio of the tensile strength of the abraded specimen to that of virgin specimen  
 d) It is the ratio of the tensile strength of the virgin specimen and the abraded specimen
- 8) What are the disadvantages of reinforced concrete retaining walls?  
 a) Construction height is limited due to practical reasons  
 b) Long construction times  
 c) Self-weight is so high that foundation should be strong  
 d) All of the above

- Page 11 of 12

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Geosynthetics and Reinforced Soil Structures**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any Eight questions.  
2) Figures to the right indicate full marks.

- |             |  |           |
|-------------|--|-----------|
| <b>Q.2</b>  | What is Geosynthetic? Explain advantages of geosynthetics.   | <b>05</b> |
| <b>Q.3</b>  | List out different types of Geosynthetics. Explain any four.   | <b>05</b> |
| <b>Q.4</b>  | Explain in detail Erosion Control. What are the different types of erosion forces & List different Protection Systems. | <b>05</b> |
| <b>Q.5</b>  | What is Landfill? Explain role of Geosynthetics in Landfills.  | <b>05</b> |
| <b>Q.6</b>  | What are the concepts of reinforced soil?  | <b>05</b> |
| <b>Q.7</b>  | What are the mechanical properties of geosynthetics?   | <b>05</b> |
| <b>Q.8</b>  | What is Embankment/Slope? Draw different failure modes of embankments.   | <b>05</b> |
| <b>Q.9</b>  | Explain in detail Pavement applications of Geosynthetics.  | <b>05</b> |
| <b>Q.10</b> | Write in detail functions of geosynthetics.  | <b>05</b> |
| <b>Q.11</b> | How are impact and abrasion test conducted?  | <b>05</b> |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Rural Roads**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Arrange the following survey in correct order which they conduct in locating the alignment of rural roads.
  - 1) Preliminary survey
  - 2) Reconnaissance
  - 3) Determination of final center line
  - 4) Final location & Detailed survey
  - a) 1, 2, 3 and 4
  - b) 2, 1, 3 and 4
  - c) 3, 2, 1 and 4
  - d) 4, 1, 2 and 3
- 2) The cross slope of the country for rolling terrain is lies between \_\_\_\_\_.
  - a) 0-10%
  - b) 10-25%
  - c) 25-60%
  - d) >60%
- 3) The standard width of single lane carriageway for both plain and rolling as well as mountainous and steep terrain shall be \_\_\_\_\_.
  - a) 3.5m
  - b) 5.5m
  - c) 3.75m
  - d) 7.0m
- 4) The Intermediate sight distance is equal to \_\_\_\_\_.
  - a) Equal to Stopping Sight Distance
  - b) Twice the Stopping Sight Distance
  - c) Thrice the Stopping Sight Distance
  - d) Equal to Overtaking Sight Distance
- 5) Maximum density requirement for construction of subgrade and earthen shoulders is \_\_\_\_\_.
  - a) 1.44gm/cc
  - b) 1.52gm/cc
  - c) 1.65gm/cc
  - d) 2.0gm/cc
- 6) Loas Angeles abrasion test of aggregate measures?
  - a) Strength Property
  - b) Hardness Property
  - c) Toughness Property
  - d) Durability
- 7) Specific Gravity of bitumen lies between \_\_\_\_\_.
  - a) 2-2.5
  - b) 1.0-1.05
  - c) 2.5-3
  - d) <0.5

- 8) The standard axle load considered for single axle in pavement design of rural road is \_\_\_\_\_.
  - a) 10.2 tonne
  - b) 15.0 tonne
  - c) 8.17 tonne
  - d) 14.2 tonne
- 9) Arrange the correct order of rural construction with flexible pavement from bottom to top: \_\_\_\_\_.
  - a) Drainage layer, Subgrade, subbase layer, Base Layer & Surface course
  - b) Surface course Subgrade, Drainage layer, subbase layer & Base Layer
  - c) Subgrade, Drainage layer, subbase layer, Base Layer & Surface course
  - d) Base Layer, Subgrade, Drainage layer, subbase layer & Surface course
- 10) The minimum camber value required for concrete surface is \_\_\_\_\_.
  - a) 4%
  - b) 3.5%
  - c) 3.0%
  - d) 2.0%



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Rural Roads**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data whenever needed & mention it clearly.

**Q.2 Solve any FIVE questions. (Each carries 8 marks)**

**40**

- a) What is the objective of reconnaissance survey? Discuss the information collected in this survey.
- b) Briefly outline the importance of below road cross sectional elements with mentioning geometric design standards.
  - 1) Transition curves
  - 2) Road Camber
  - 3) Sight Distance
  - 4) Superelevation
- c) Explain the step-by-step construction process of road fly-ash embankment mentioning its requirement and specifications.
- d) Write a brief note on applications of Lime stabilization and Cement Stabilization.
- e) Determine the AADT as per IRC-SP-72-2015 using below data: Lean season traffic (T)=60 vehicles per day, Duration of harvesting season (t)=30 days. Traffic at the peak harvesting season increases by 5 times.
- f) Elaborate the importance of below tests with its desirable values:
  - 1) Los Angeles abrasion tests
  - 2) Bitumen Penetration tests
  - 3) Softening point tests
- g) Explain with neat sketch surface and sub-surface drainage system for rural roads.
- h) Write a detailed note on advantages of below materials in the rural road construction.
  - 1) Fly ash
  - 2) Iron and steel slag
  - 3) Granulated Blast furnace slag

Seat No.	
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Set Q
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Rural Roads**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Loas Angeles abrasion test of aggregate measures?
  - a) Strength Property
  - b) Hardness Property
  - c) Toughness Property
  - d) Durability
- 2) Specific Gravity of bitumen lies between \_\_\_\_\_.
  - a) 2-2.5
  - b) 1.0-1.05
  - c) 2.5-3
  - d) <0.5
- 3) The standard axle load considered for single axle in pavement design of rural road is \_\_\_\_\_.
  - a) 10.2 tonne
  - b) 15.0 tonne
  - c) 8.17 tonne
  - d) 14.2 tonne
- 4) Arrange the correct order of rural construction with flexible pavement from bottom to top: \_\_\_\_\_.
  - a) Drainage layer, Subgrade, subbase layer, Base Layer & Surface course
  - b) Surface course Subgrade, Drainage layer, subbase layer & Base Layer
  - c) Subgrade, Drainage layer, subbase layer, Base Layer & Surface course
  - d) Base Layer, Subgrade, Drainage layer, subbase layer & Surface course
- 5) The minimum camber value required for concrete surface is \_\_\_\_\_.
  - a) 4%
  - b) 3.5%
  - c) 3.0%
  - d) 2.0%
- 6) Arrange the following survey in correct order which they conduct in locating the alignment of rural roads.
  - 1) Preliminary survey
  - 2) Reconnaissance
  - 3) Determination of final center line
  - 4) Final location & Detailed survey
  - a) 1, 2, 3 and 4
  - b) 2, 1, 3 and 4
  - c) 3, 2, 1 and 4
  - d) 4, 1, 2 and 3

- 7) The cross slope of the country for rolling terrain is lies between \_\_\_\_\_.
  - a) 0-10%
  - b) 10-25%
  - c) 25-60%
  - d) >60%
- 8) The standard width of single lane carriageway for both plain and rolling as well as mountainous and steep terrain shall be \_\_\_\_\_.
  - a) 3.5m
  - b) 5.5m
  - c) 3.75m
  - d) 7.0m
- 9) The Intermediate sight distance is equal to \_\_\_\_\_.
  - a) Equal to Stopping Sight Distance
  - b) Twice the Stopping Sight Distance
  - c) Thrice the Stopping Sight Distance
  - d) Equal to Overtaking Sight Distance
- 10) Maximum density requirement for construction of subgrade and earthen shoulders is \_\_\_\_\_.
  - a) 1.44gm/cc
  - b) 1.52gm/cc
  - c) 1.65gm/cc
  - d) 2.0gm/cc

<b>Seat No.</b>	
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**Set Q**

**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Rural Roads**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data whenever needed & mention it clearly.

**Q.2 Solve any FIVE questions. (Each carries 8 marks)**

**40**

- a) What is the objective of reconnaissance survey? Discuss the information collected in this survey.
- b) Briefly outline the importance of below road cross sectional elements with mentioning geometric design standards.
  - 1) Transition curves
  - 2) Road Camber
  - 3) Sight Distance
  - 4) Superelevation
- c) Explain the step-by-step construction process of road fly-ash embankment mentioning its requirement and specifications.
- d) Write a brief note on applications of Lime stabilization and Cement Stabilization.
- e) Determine the AADT as per IRC-SP-72-2015 using below data: Lean season traffic (T)=60 vehicles per day, Duration of harvesting season (t)=30 days. Traffic at the peak harvesting season increases by 5 times.
- f) Elaborate the importance of below tests with its desirable values:
  - 1) Los Angeles abrasion tests
  - 2) Bitumen Penetration tests
  - 3) Softening point tests
- g) Explain with neat sketch surface and sub-surface drainage system for rural roads.
- h) Write a detailed note on advantages of below materials in the rural road construction.
  - 1) Fly ash
  - 2) Iron and steel slag
  - 3) Granulated Blast furnace slag

Seat No.	
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Set	R
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Rural Roads**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Arrange the correct order of rural construction with flexible pavement from bottom to top: \_\_\_\_\_.
  - a) Drainage layer, Subgrade, subbase layer, Base Layer & Surface course
  - b) Surface course Subgrade, Drainage layer, subbase layer & Base Layer
  - c) Subgrade, Drainage layer, subbase layer, Base Layer & Surface course
  - d) Base Layer, Subgrade, Drainage layer, subbase layer & Surface course
- 2) The minimum camber value required for concrete surface is \_\_\_\_\_.
  - a) 4%
  - b) 3.5%
  - c) 3.0%
  - d) 2.0%
- 3) Arrange the following survey in correct order which they conduct in locating the alignment of rural roads.
  - 1) Preliminary survey
  - 2) Reconnaissance
  - 3) Determination of final center line
  - 4) Final location & Detailed survey
  - a) 1, 2, 3 and 4
  - b) 2, 1, 3 and 4
  - c) 3, 2, 1 and 4
  - d) 4, 1, 2 and 3
- 4) The cross slope of the country for rolling terrain is lies between \_\_\_\_\_.
  - a) 0-10%
  - b) 10-25%
  - c) 25-60%
  - d) >60%
- 5) The standard width of single lane carriageway for both plain and rolling as well as mountainous and steep terrain shall be \_\_\_\_\_.
  - a) 3.5m
  - b) 5.5m
  - c) 3.75m
  - d) 7.0m

- 6) The Intermediate sight distance is equal to \_\_\_\_\_.  
a) Equal to Stopping Sight Distance  
b) Twice the Stopping Sight Distance  
c) Thrice the Stopping Sight Distance  
d) Equal to Overtaking Sight Distance
- 7) Maximum density requirement for construction of subgrade and earthen shoulders is \_\_\_\_\_.  
a) 1.44gm/cc  
b) 1.52gm/cc  
c) 1.65gm/cc  
d) 2.0gm/cc
- 8) Los Angeles abrasion test of aggregate measures?  
a) Strength Property  
b) Hardness Property  
c) Toughness Property  
d) Durability
- 9) Specific Gravity of bitumen lies between \_\_\_\_\_.  
a) 2-2.5  
b) 1.0-1.05  
c) 2.5-3  
d) <0.5
- 10) The standard axle load considered for single axle in pavement design of rural road is \_\_\_\_\_.  
a) 10.2 tonne  
b) 15.0 tonne  
c) 8.17 tonne  
d) 14.2 tonne

<b>Seat No.</b>	
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**Set**

<b>R</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Rural Roads**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data whenever needed & mention it clearly.

**Q.2 Solve any FIVE questions. (Each carries 8 marks)**

**40**

- a) What is the objective of reconnaissance survey? Discuss the information collected in this survey.
- b) Briefly outline the importance of below road cross sectional elements with mentioning geometric design standards.
  - 1) Transition curves
  - 2) Road Camber
  - 3) Sight Distance
  - 4) Superelevation
- c) Explain the step-by-step construction process of road fly-ash embankment mentioning its requirement and specifications.
- d) Write a brief note on applications of Lime stabilization and Cement Stabilization.
- e) Determine the AADT as per IRC-SP-72-2015 using below data: Lean season traffic (T)=60 vehicles per day, Duration of harvesting season (t)=30 days. Traffic at the peak harvesting season increases by 5 times.
- f) Elaborate the importance of below tests with its desirable values:
  - 1) Los Angeles abrasion tests
  - 2) Bitumen Penetration tests
  - 3) Softening point tests
- g) Explain with neat sketch surface and sub-surface drainage system for rural roads.
- h) Write a detailed note on advantages of below materials in the rural road construction.
  - 1) Fly ash
  - 2) Iron and steel slag
  - 3) Granulated Blast furnace slag

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 10

**10**

- Page 10 of 12



- 7) Arrange the correct order of rural construction with flexible pavement from bottom to top: \_\_\_\_\_.
  - a) Drainage layer, Subgrade, subbase layer, Base Layer & Surface course
  - b) Surface course Subgrade, Drainage layer, subbase layer & Base Layer
  - c) Subgrade, Drainage layer, subbase layer, Base Layer & Surface course
  - d) Base Layer, Subgrade, Drainage layer, subbase layer & Surface course
- 8) The minimum camber value required for concrete surface is \_\_\_\_\_.
  - a) 4%
  - b) 3.5%
  - c) 3.0%
  - d) 2.0%
- 9) Arrange the following survey in correct order which they conduct in locating the alignment of rural roads.
  - 1) Preliminary survey
  - 2) Reconnaissance
  - 3) Determination of final center line
  - 4) Final location & Detailed survey
  - a) 1, 2, 3 and 4
  - b) 2, 1, 3 and 4
  - c) 3, 2, 1 and 4
  - d) 4, 1, 2 and 3
- 10) The cross slope of the country for rolling terrain is lies between \_\_\_\_\_.
  - a) 0-10%
  - b) 10-25%
  - c) 25-60%
  - d) >60%

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Rural Roads**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data whenever needed & mention it clearly.

**Q.2 Solve any FIVE questions. (Each carries 8 marks)**

**40**

- a) What is the objective of reconnaissance survey? Discuss the information collected in this survey.
- b) Briefly outline the importance of below road cross sectional elements with mentioning geometric design standards.
  - 1) Transition curves
  - 2) Road Camber
  - 3) Sight Distance
  - 4) Superelevation
- c) Explain the step-by-step construction process of road fly-ash embankment mentioning its requirement and specifications.
- d) Write a brief note on applications of Lime stabilization and Cement Stabilization.
- e) Determine the AADT as per IRC-SP-72-2015 using below data: Lean season traffic (T)=60 vehicles per day, Duration of harvesting season (t)=30 days. Traffic at the peak harvesting season increases by 5 times.
- f) Elaborate the importance of below tests with its desirable values:
  - 1) Los Angeles abrasion tests
  - 2) Bitumen Penetration tests
  - 3) Softening point tests
- g) Explain with neat sketch surface and sub-surface drainage system for rural roads.
- h) Write a detailed note on advantages of below materials in the rural road construction.
  - 1) Fly ash
  - 2) Iron and steel slag
  - 3) Granulated Blast furnace slag

<b>Seat No.</b>	
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**Set****P**

**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Planning for Sustainable Development**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any five questions.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Q.1 Attempt any five of the following question. (10 marks each)**

- |    |  |           |
|----|--|-----------|
| 1) | Enlist the principles of sustainable development.  | <b>10</b> |
| 2) | Explain the need of Innovation strategies & Environmental Management.                      | <b>10</b> |
| 3) | Analyze institutional theory in sustainable development in detail?                         | <b>10</b> |
| 4) | What are the policy responses for environmental degradation?                               | <b>10</b> |
| 5) | What measures can be undertaken for sustainable development in civil engineering projects? | <b>10</b> |
| 6) | What do you understand by 'Squaring the circle' concept in sustainable management?         | <b>10</b> |
| 7) | Explain the contribution of innovation in sustainable development?                         | <b>10</b> |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Planning for Sustainable Development**

Day & Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any five questions.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Q.1 Attempt any five of the following question. (10 marks each)**

- |    |  |    |
|----|--|----|
| 1) | Enlist the principles of sustainable development.  | 10 |
| 2) | Explain the need of Innovation strategies & Environmental Management.                      | 10 |
| 3) | Analyze institutional theory in sustainable development in detail?                         | 10 |
| 4) | What are the policy responses for environmental degradation?                               | 10 |
| 5) | What measures can be undertaken for sustainable development in civil engineering projects? | 10 |
| 6) | What do you understand by 'Squaring the circle' concept in sustainable management?         | 10 |
| 7) | Explain the contribution of innovation in sustainable development?                         | 10 |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Planning for Sustainable Development**

Day & Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any five questions.

2) Figures to the right indicates full marks

3) Assume suitable data wherever needed and mention it clearly.

**Q.1 Attempt any five of the following question. (10 marks each)**

- |    |  |    |
|----|--|----|
| 1) | Enlist the principles of sustainable development.  | 10 |
| 2) | Explain the need of Innovation strategies & Environmental Management.                      | 10 |
| 3) | Analyze institutional theory in sustainable development in detail?                         | 10 |
| 4) | What are the policy responses for environmental degradation?                               | 10 |
| 5) | What measures can be undertaken for sustainable development in civil engineering projects? | 10 |
| 6) | What do you understand by 'Squaring the circle' concept in sustainable management?         | 10 |
| 7) | Explain the contribution of innovation in sustainable development?                         | 10 |

<b>Seat No.</b>	
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**Set**

<b>S</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Planning for Sustainable Development**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Attempt any five questions.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Q.1 Attempt any five of the following question. (10 marks each)**

- |    |  |           |
|----|--|-----------|
| 1) | Enlist the principles of sustainable development.  | <b>10</b> |
| 2) | Explain the need of Innovation strategies & Environmental Management.                      | <b>10</b> |
| 3) | Analyze institutional theory in sustainable development in detail?                         | <b>10</b> |
| 4) | What are the policy responses for environmental degradation?                               | <b>10</b> |
| 5) | What measures can be undertaken for sustainable development in civil engineering projects? | <b>10</b> |
| 6) | What do you understand by 'Squaring the circle' concept in sustainable management?         | <b>10</b> |
| 7) | Explain the contribution of innovation in sustainable development?                         | <b>10</b> |

Seat No.	
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Set **P**

**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**TQM and MIS in Civil Engineering**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) What is the full form of TQM?
 

a) True quality machining	b) Total quality management
c) True quantitative machining	d) Total queue management
- 2) The objective of ISO-9000 family of Quality management is \_\_\_\_\_.
 

a) Customer satisfaction	b) Employee satisfaction
c) Skill enhancement	d) Environmental issues
- 3) Total Quality Management (TQM) focuses on \_\_\_\_\_.
 

a) Employee	b) Customer
c) Both (a) and (b)	d) None of the above
- 4) TQM & ISO both focuses on \_\_\_\_\_.
 

a) Customer	b) Employee
c) Supplier	d) All of the above
- 5) A fundamental attribute of TQM is \_\_\_\_\_.
 

a) Drawing control charts
b) Top management's direct involvement
c) Meeting ISO 9000 audit
d) All of above
- 6) The information of MIS comes from the \_\_\_\_\_.
 

a) Internal source
b) External source
c) Both internal and external source
d) None of the above
- 7) An information system that supports the planning and assessment needs of executive management is \_\_\_\_\_.
 

a) DSS	b) ERP
c) MIS	d) None of the above
- 8) The back bone of any organization is \_\_\_\_\_.
 

a) Information	b) Employee
c) Management	d) Capital

- 9)** Which one is not Prerequisite of an effective MIS?
- |                   |                       |
|-------------------|-----------------------|
| a) Database       | b) Support from staff |
| c) Both a) and b) | d) None of these      |
- 10)** A computer-based information system \_\_\_\_\_.
- |                           |                           |
|---------------------------|---------------------------|
| a) Require manually input | b) No need manually input |
| c) Auto input             | d) None of these          |



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**TQM and MIS in Civil Engineering**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever necessary and mention it clearly.  
4) Use of non-programmable calculator is allowed.

**Q.2 Solve any four. 20**

- a) Explain the importance of Quality control in Construction sector?
- b) What are the factors to be considered to have good quality control in construction project?
- c) Explain in brief with Objective and significance of "Total Quality Management"?
- d) Explain in brief the Quality Circle and its function.
- e) Explain in brief "Supply Chain Management" as a tool in TQM.
- f) What is "Six Sigma"? Explain in brief "Object and function of Six Sigma for Quality control".

**Q.3 Solve any four. 20**

- a) What is "Management Information System (MIS)"? Explain in brief Objective and function MIS.
- b) Explain in brief the difference between "Data and Information".
- c) Explain in brief "Data Processing system and MIS".
- d) Explain the use of MIS in field of construction industry.
- e) Define the term Database and its benefits to any sector.
- f) Explain in brief the role of computer in construction industry.

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**TQM and MIS in Civil Engineering**

Day & Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:**
- 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
  - 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
  - 3) Figures to the right indicates full marks
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) The information of MIS comes from the \_\_\_\_\_.  
 a) Internal source  
 b) External source  
 c) Both internal and external source  
 d) None of the above
- 2) An information system that supports the planning and assessment needs of executive management is \_\_\_\_\_.  
 a) DSS  
 b) ERP  
 c) MIS  
 d) None of the above
- 3) The back bone of any organization is \_\_\_\_\_.  
 a) Information  
 b) Employee  
 c) Management  
 d) Capital
- 4) Which one is not Prerequisite of an effective MIS?  
 a) Database  
 b) Support from staff  
 c) Both a) and b)  
 d) None of these
- 5) A computer-based information system \_\_\_\_\_.  
 a) Require manually input  
 b) No need manually input  
 c) Auto input  
 d) None of these
- 6) What is the full form of TQM?  
 a) True quality machining  
 b) Total quality management  
 c) True quantitative machining  
 d) Total queue management
- 7) The objective of ISO-9000 family of Quality management is \_\_\_\_\_.  
 a) Customer satisfaction  
 b) Employee satisfaction  
 c) Skill enhancement  
 d) Environmental issues
- 8) Total Quality Management (TQM) focuses on \_\_\_\_\_.  
 a) Employee  
 b) Customer  
 c) Both (a) and (b)  
 d) None of the above
- 9) TQM & ISO both focuses on \_\_\_\_\_.  
 a) Customer  
 b) Employee  
 c) Supplier  
 d) All of the above

- 10)** A fundamental attribute of TQM is \_\_\_\_\_.  
a) Drawing control charts  
b) Top management's direct involvement  
c) Meeting ISO 9000 audit  
d) All of above

<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022****CIVIL ENGINEERING****TQM and MIS in Civil Engineering**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever necessary and mention it clearly.  
4) Use of non-programmable calculator is allowed.

**Q.2 Solve any four. 20**

- a) Explain the importance of Quality control in Construction sector?
- b) What are the factors to be considered to have good quality control in construction project?
- c) Explain in brief with Objective and significance of "Total Quality Management"?
- d) Explain in brief the Quality Circle and its function.
- e) Explain in brief "Supply Chain Management" as a tool in TQM.
- f) What is "Six Sigma"? Explain in brief "Object and function of Six Sigma for Quality control".

**Q.3 Solve any four. 20**

- a) What is "Management Information System (MIS)"? Explain in brief Objective and function MIS.
- b) Explain in brief the difference between "Data and Information".
- c) Explain in brief "Data Processing system and MIS".
- d) Explain the use of MIS in field of construction industry.
- e) Define the term Database and its benefits to any sector.
- f) Explain in brief the role of computer in construction industry.

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**TQM and MIS in Civil Engineering**

Day & Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which one is not Prerequisite of an effective MIS?
  - a) Database
  - b) Support from staff
  - c) Both a) and b)
  - d) None of these
- 2) A computer-based information system \_\_\_\_\_.
  - a) Require manually input
  - b) No need manually input
  - c) Auto input
  - d) None of these
- 3) What is the full form of TQM?
  - a) True quality machining
  - b) Total quality management
  - c) True quantitative machining
  - d) Total queue management
- 4) The objective of ISO-9000 family of Quality management is \_\_\_\_\_.
  - a) Customer satisfaction
  - b) Employee satisfaction
  - c) Skill enhancement
  - d) Environmental issues
- 5) Total Quality Management (TQM) focuses on \_\_\_\_\_.
  - a) Employee
  - b) Customer
  - c) Both (a) and (b)
  - d) None of the above
- 6) TQM & ISO both focuses on \_\_\_\_\_.
  - a) Customer
  - b) Employee
  - c) Supplier
  - d) All of the above
- 7) A fundamental attribute of TQM is \_\_\_\_\_.
  - a) Drawing control charts
  - b) Top management's direct involvement
  - c) Meeting ISO 9000 audit
  - d) All of above
- 8) The information of MIS comes from the \_\_\_\_\_.
  - a) Internal source
  - b) External source
  - c) Both internal and external source
  - d) None of the above

- 9)** An information system that supports the planning and assessment needs of executive management is \_\_\_\_\_.  
a) DSS                                      b) ERP  
c) MIS                                        d) None of the above
- 10)** The back bone of any organization is \_\_\_\_\_.  
a) Information                              b) Employee  
c) Management                             d) Capital

<b>Seat No.</b>	
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**Set R****T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022****CIVIL ENGINEERING****TQM and MIS in Civil Engineering**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever necessary and mention it clearly.  
4) Use of non-programmable calculator is allowed.

**Q.2 Solve any four. 20**

- a) Explain the importance of Quality control in Construction sector?
- b) What are the factors to be considered to have good quality control in construction project?
- c) Explain in brief with Objective and significance of "Total Quality Management"?
- d) Explain in brief the Quality Circle and its function.
- e) Explain in brief "Supply Chain Management" as a tool in TQM.
- f) What is "Six Sigma"? Explain in brief "Object and function of Six Sigma for Quality control".

**Q.3 Solve any four. 20**

- a) What is "Management Information System (MIS)"? Explain in brief Objective and function MIS.
- b) Explain in brief the difference between "Data and Information".
- c) Explain in brief "Data Processing system and MIS".
- d) Explain the use of MIS in field of construction industry.
- e) Define the term Database and its benefits to any sector.
- f) Explain in brief the role of computer in construction industry.

<b>Seat No.</b>	
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## CIVIL ENGINEERING

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

10

- 1) Total Quality Management (TQM) focuses on \_\_\_\_\_.  
a) Employee                                  b) Customer  
c) Both (a) and (b)                      d) None of the above
- 2) TQM & ISO both focus on \_\_\_\_\_.  
a) Customer                                b) Employee  
c) Supplier                                 d) All of the above
- 3) A fundamental attribute of TQM is \_\_\_\_\_.  
a) Drawing control charts  
b) Top management's direct involvement  
c) Meeting ISO 9000 audit  
d) All of above
- 4) The information of MIS comes from the \_\_\_\_\_.  
a) Internal source  
b) External source  
c) Both internal and external source  
d) None of the above
- 5) An information system that supports the planning and assessment needs of executive management is \_\_\_\_\_.  
a) DSS                                        b) ERP  
c) MIS                                         d) None of the above
- 6) The back bone of any organization is \_\_\_\_\_.  
a) Information                               b) Employee  
c) Management                             d) Capital
- 7) Which one is not Prerequisite of an effective MIS?  
a) Database                                 b) Support from staff  
c) Both a) and b)                         d) None of these
- 8) A computer-based information system \_\_\_\_\_.  
a) Require manually input               b) No need manually input  
c) Auto input                                d) None of these



- 9)** What is the full form of TQM?
- |                                |                             |
|--------------------------------|-----------------------------|
| a) True quality machining      | b) Total quality management |
| c) True quantitative machining | d) Total queue management   |
- 10)** The objective of ISO-9000 family of Quality management is \_\_\_\_\_.  
a) Customer satisfaction      b) Employee satisfaction  
c) Skill enhancement          d) Environmental issues

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**TQM and MIS in Civil Engineering**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever necessary and mention it clearly.  
4) Use of non-programmable calculator is allowed.

**Q.2 Solve any four.** **20**

- a) Explain the importance of Quality control in Construction sector?
- b) What are the factors to be considered to have good quality control in construction project?
- c) Explain in brief with Objective and significance of "Total Quality Management"?
- d) Explain in brief the Quality Circle and its function.
- e) Explain in brief "Supply Chain Management" as a tool in TQM.
- f) What is "Six Sigma"? Explain in brief "Object and function of Six Sigma for Quality control".

**Q.3 Solve any four.** **20**

- a) What is "Management Information System (MIS)"? Explain in brief Objective and function MIS.
- b) Explain in brief the difference between "Data and Information".
- c) Explain in brief "Data Processing system and MIS".
- d) Explain the use of MIS in field of construction industry.
- e) Define the term Database and its benefits to any sector.
- f) Explain in brief the role of computer in construction industry.

<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Earthquake Resistant Non Engineered Construction**

Day & Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Solve any five questions.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

- |            |   |           |
|------------|---|-----------|
| <b>Q.1</b> | Write detailed note on internal structure of Earth.                             | <b>10</b> |
| <b>Q.2</b> | Which are the seismic waves generated after earthquake.                         | <b>10</b> |
| <b>Q.3</b> | Explain the different magnitude scales to measure an earthquake.                | <b>10</b> |
| <b>Q.4</b> | What are causes of damages due to earthquake in the stone masonry construction? | <b>10</b> |
| <b>Q.5</b> | What is meant by Strengthening? Explain few Strengthening features for walls.   | <b>10</b> |
| <b>Q.6</b> | Explain the significance of RC bands in masonry construction.                   | <b>10</b> |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Earthquake Resistant Non Engineered Construction**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Solve any five questions.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

- |            |   |           |
|------------|---|-----------|
| <b>Q.1</b> | Write detailed note on internal structure of Earth.                             | <b>10</b> |
| <b>Q.2</b> | Which are the seismic waves generated after earthquake.                         | <b>10</b> |
| <b>Q.3</b> | Explain the different magnitude scales to measure an earthquake.                | <b>10</b> |
| <b>Q.4</b> | What are causes of damages due to earthquake in the stone masonry construction? | <b>10</b> |
| <b>Q.5</b> | What is meant by Strengthening? Explain few Strengthening features for walls.   | <b>10</b> |
| <b>Q.6</b> | Explain the significance of RC bands in masonry construction.                   | <b>10</b> |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Earthquake Resistant Non Engineered Construction**

Day & Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any five questions.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

- |            |   |           |
|------------|---|-----------|
| <b>Q.1</b> | Write detailed note on internal structure of Earth.                             | <b>10</b> |
| <b>Q.2</b> | Which are the seismic waves generated after earthquake.                         | <b>10</b> |
| <b>Q.3</b> | Explain the different magnitude scales to measure an earthquake.                | <b>10</b> |
| <b>Q.4</b> | What are causes of damages due to earthquake in the stone masonry construction? | <b>10</b> |
| <b>Q.5</b> | What is meant by Strengthening? Explain few Strengthening features for walls.   | <b>10</b> |
| <b>Q.6</b> | Explain the significance of RC bands in masonry construction.                   | <b>10</b> |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Earthquake Resistant Non Engineered Construction**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Solve any five questions.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

- |            |   |           |
|------------|---|-----------|
| <b>Q.1</b> | Write detailed note on internal structure of Earth.                             | <b>10</b> |
| <b>Q.2</b> | Which are the seismic waves generated after earthquake.                         | <b>10</b> |
| <b>Q.3</b> | Explain the different magnitude scales to measure an earthquake.                | <b>10</b> |
| <b>Q.4</b> | What are causes of damages due to earthquake in the stone masonry construction? | <b>10</b> |
| <b>Q.5</b> | What is meant by Strengthening? Explain few Strengthening features for walls.   | <b>10</b> |
| <b>Q.6</b> | Explain the significance of RC bands in masonry construction.                   | <b>10</b> |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Engineering Economics, Estimation & Costing**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) 'Money received today is more worth than money received in future' is based on which of the following term
 

a) Time Value of money	b) Storage Value of Money
c) Time Machine	d) Cash Value of Machine
- 2) A Project assumed monetary gain or loss by discounting entire cash inflow or outflow by utilizing the necessary rate of return is
 

a) Net recorded cash value
b) Net discounted cash value
c) Net future value
d) Net present value
- 3) A sum of Rs 10000 is deposited in a bank as a fixed deposit for 3 years. The bank pays 9% interest annually. How much money, in Rs., will be received at the maturity if the fixed deposit is encashed?
 

a) 12950	b) 12700
c) 11800	d) none of the above
- 4) Which of the following equation is used to calculate the future value of the cash flow?
 

a) $NPV (1 - i)^n$	b) $NPV + (1 - i)^n$
c) $NPV(1 + i)^n$	d) $NPV / (1 + i)^n$
- 5) The internal rate of return is the discount rate for which the NPV is
 

a) less than 1	b) +ve
c) -ve	d) zero
- 6) Considers impact of cash flow even after payback period
 

a) Net present value
b) return on investment
c) Sensitivity analysis
d) simple payback period
- 7) The net present value (NPV) is
 

a) equal to the sum of the present values of all cash flows
b) equal to the sum of returns
c) equal to the sum of all cash flows
d) none of the above

- 8) While submitting a tender, the contractor is required to deposit some amount with the department as a guarantee of the tender known as
- a) Earnest money
  - b) Bank Guarantee
  - c) Security Deposit
  - d) Caution money
- 9) In India the flexible pavement is designed as per
- a) msa
  - b) Ksa
  - c) csa
  - d) Fsa
- 10) Make out an estimate for a work the following data are necessary- Drawing, Specification and \_\_\_\_.
- a) materials
  - b) Rates
  - c) labours
  - d) Transportation
- 11) The quantity of sand required for RCC (1:2:4) for 15 cubic metres of work is \_\_\_\_.
- a) 4.76 m<sup>3</sup>
  - b) 10.32 m<sup>3</sup>
  - c) 8.43 m<sup>3</sup>
  - d) 6.51 m<sup>3</sup>
- 12) Workout the years purchase of the property if the rate of interest is 6% per annum \_\_\_\_.
- a) 6
  - b) 16.67
  - c) 0.1667
  - d) 0.06
- 13) The value at the end of utility of property but without dismantling is known as \_\_\_\_.
- a) Scrap Value
  - b) Salvage value
  - c) Market value
  - d) Book value
- 14) Definition of "Employee" under the Minimum Wages Act, 1948 includes
- a) Skilled labour - Clerical labour
  - b) Skilled and unskilled both labour - Manual labour
  - c) Skilled and unskilled both labour - Manual and clerical both labour
  - d) Unskilled labour- Manual labour



Seat No.	
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Set **P**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Engineering Economics, Estimation & Costing**

Day &amp; Date: Wednesday, 25-01-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) From Section – I Q. 2 is compulsory. Attempt any two out of Q. 3 to Q. 5.  
 2) From Section – II Q. 6 is compulsory. Attempt any two out of Q.7 to Q. 9.  
 3) Figures to the right indicates full marks

**Section – I**

- Q.2**    **A)**    Prepare a measurement sheet for the following items of construction of a compound wall around a plot of 6.50m × 12.20m. Assume the following specifications for the following items. **08**
- a)    Excavation Trench for foundation: Width=0.60m, Depth below GL=1.000m
- b)    PCC(M10) 0.10 thick below foundation: Width=0.60m,
- c)    UCR in foundation height = 0.800m
- d)    PCC(M10) 0.10 thick above foundation
- B)**    Also prepare an Abstract sheet for these items by assuming suitable market rates. **04**
- Q.3**    **A)**    What are thumb rules for determining the following quantities of materials? **04**
- a)    No.of cement bags required for construction of building
- b)    Steel reinforcement required for RCC in cement concrete
- B)**    Detailed specifications for buildings. **04**
- Q.4**    Carry out Rate analysis of following items of work **08**
- a)    Plane Cement Concrete (M10) in Foundation
- b)    UCR in Foundation
- Q.5**    Compare following methods of calculating depreciation **08**
- a)    Straight line method, declining balance method.
- b)    Sinking fund method, quantity survey method

**Section - II**

- Q.6**    **A)**    Prepare a tender notice for the work of construction of your house of G+1 storied RCC structure of 100 Sqm built up area. Make suitable assumptions for required data. **08**
- B)**    Compare Item Rate contract and Percentage rate contract. **04**
- Q.7**    Explain following Acts **08**
- a)    Minimum Wages Act
- b)    Workers Compensation Act

- |            |           |  |           |
|------------|-----------|--|-----------|
| <b>Q.8</b> | <b>a)</b> | Explain Belting Method of Valuation.   | <b>04</b> |
|            | <b>b)</b> | Calculate Years Purchase for a property with a useful life of 30 years if rate of interest is 5% per year. Assume rate of interest for sinking fund as 3%. | <b>04</b> |
|            |           |  |           |
| <b>Q.9</b> | <b>a)</b> | Enlist and Explain the 'Factors affecting valuation of properties'.  | <b>04</b> |
|            | <b>b)</b> | Enlist and explain the different types of values.  | <b>04</b> |

Seat No.	
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Set Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Engineering Economics, Estimation & Costing**

Day & Date: Wednesday, 25-01-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) While submitting a tender, the contractor is required to deposit some amount with the department as a guarantee of the tender known as
  - a) Earnest money
  - b) Bank Guarantee
  - c) Security Deposit
  - d) Caution money
- 2) In India the flexible pavement is designed as per
  - a) msa
  - b) Ksa
  - c) csa
  - d) Fsa
- 3) Make out an estimate for a work the following data are necessary- Drawing, Specification and \_\_\_\_\_.
  - a) materials
  - b) Rates
  - c) labours
  - d) Transportation
- 4) The quantity of sand required for RCC (1:2:4) for 15 cubic metres of work is \_\_\_\_\_.
  - a) 4.76 m<sup>3</sup>
  - b) 10.32 m<sup>3</sup>
  - c) 8.43 m<sup>3</sup>
  - d) 6.51 m<sup>3</sup>
- 5) Workout the years purchase of the property if the rate of interest is 6% per annum \_\_\_\_\_.
  - a) 6
  - b) 16.67
  - c) 0.1667
  - d) 0.06
- 6) The value at the end of utility of property but without dismantling is known as \_\_\_\_\_.
  - a) Scrap Value
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  - c) Market value
  - d) Book value
- 7) Definition of "Employee" under the Minimum Wages Act, 1948 includes
  - a) Skilled labour - Clerical labour
  - b) Skilled and unskilled both labour - Manual labour
  - c) Skilled and unskilled both labour - Manual and clerical both labour
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- 8) 'Money received today is more worth than money received in future' is based on which of the following term
- a) Time Value of money
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  - c) Time Machine
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- 10) A sum of Rs 10000 is deposited in a bank as a fixed deposit for 3 years. The bank pays 9% interest annually. How much money, in Rs., will be received at the maturity if the fixed deposit is encashed?
- a) 12950
  - b) 12700
  - c) 11800
  - d) none of the above
- 11) Which of the following equation is used to calculate the future value of the cash flow?
- a)  $NPV (1 - i)^n$
  - b)  $NPV + (1 - i)^n$
  - c)  $NPV(1 + i)^n$
  - d)  $NPV / (1 + i)^n$
- 12) The internal rate of return is the discount rate for which the NPV is
- a) less than 1
  - b) +ve
  - c) -ve
  - d) zero
- 13) Considers impact of cash flow even after payback period
- a) Net present value
  - b) return on investment
  - c) Sensitivity analysis
  - d) simple payback period
- 14) The net present value (NPV) is
- a) equal to the sum of the present values of all cash flows
  - b) equal to the sum of returns
  - c) equal to the sum of all cash flows
  - d) none of the above

Seat No.	
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Set **Q**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Engineering Economics, Estimation & Costing**

Day &amp; Date: Wednesday, 25-01-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) From Section – I Q. 2 is compulsory. Attempt any two out of Q. 3 to Q. 5.  
 2) From Section – II Q. 6 is compulsory. Attempt any two out of Q.7 to Q. 9.  
 3) Figures to the right indicates full marks

**Section – I**

- Q.2**    **A)**    Prepare a measurement sheet for the following items of construction of a compound wall around a plot of 6.50m × 12.20m. Assume the following specifications for the following items. **08**
- a)    Excavation Trench for foundation: Width=0.60m, Depth below GL=1.000m
- b)    PCC(M10) 0.10 thick below foundation: Width=0.60m,
- c)    UCR in foundation height = 0.800m
- d)    PCC(M10) 0.10 thick above foundation
- B)**    Also prepare an Abstract sheet for these items by assuming suitable market rates. **04**
- Q.3**    **A)**    What are thumb rules for determining the following quantities of materials? **04**
- a)    No.of cement bags required for construction of building
- b)    Steel reinforcement required for RCC in cement concrete
- B)**    Detailed specifications for buildings. **04**
- Q.4**    Carry out Rate analysis of following items of work **08**
- a)    Plane Cement Concrete (M10) in Foundation
- b)    UCR in Foundation
- Q.5**    Compare following methods of calculating depreciation **08**
- a)    Straight line method, declining balance method.
- b)    Sinking fund method, quantity survey method

**Section - II**

- Q.6**    **A)**    Prepare a tender notice for the work of construction of your house of G+1 storied RCC structure of 100 Sqm built up area. Make suitable assumptions for required data. **08**
- B)**    Compare Item Rate contract and Percentage rate contract. **04**
- Q.7**    Explain following Acts **08**
- a)    Minimum Wages Act
- b)    Workers Compensation Act

- |            |           |  |           |
|------------|-----------|--|-----------|
| <b>Q.8</b> | <b>a)</b> | Explain Belting Method of Valuation.   | <b>04</b> |
|            | <b>b)</b> | Calculate Years Purchase for a property with a useful life of 30 years if rate of interest is 5% per year. Assume rate of interest for sinking fund as 3%. | <b>04</b> |
|            |           |  |           |
| <b>Q.9</b> | <b>a)</b> | Enlist and Explain the 'Factors affecting valuation of properties'.  | <b>04</b> |
|            | <b>b)</b> | Enlist and explain the different types of values.  | <b>04</b> |

**Seat  
No.**

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# Engineering Economics, Estimation & Costing

Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

14

- Page 9 of 16

- 7) A sum of Rs 10000 is deposited in a bank as a fixed deposit for 3 years. The bank pays 9% interest annually. How much money, in Rs., will be received at the maturity if the fixed deposit is encashed?

  - a) 12950
  - b) 12700
  - c) 11800
  - d) none of the above
- 8) Which of the following equation is used to calculate the future value of the cash flow?

  - a)  $\text{NPV} (1 - i)^n$
  - b)  $\text{NPV} + (1 - i)^n$
  - c)  $\text{NPV}(1 + i)^n$
  - d)  $\text{NPV}/(1 + i)^n$
- 9) The internal rate of return is the discount rate for which the NPV is

  - a) less than 1
  - b) +ve
  - c) -ve
  - d) zero
- 10) Considers impact of cash flow even after payback period

  - a) Net present value
  - b) return on investment
  - c) Sensitivity analysis
  - d) simple payback period
- 11) The net present value (NPV) is

  - a) equal to the sum of the present values of all cash flows
  - b) equal to the sum of returns
  - c) equal to the sum of all cash flows
  - d) none of the above
- 12) While submitting a tender, the contractor is required to deposit some amount with the department as a guarantee of the tender known as

  - a) Earnest money
  - b) Bank Guarantee
  - c) Security Deposit
  - d) Caution money
- 13) In India the flexible pavement is designed as per

  - a) msa
  - b) Ksa
  - c) csa
  - d) Fsa
- 14) Make out an estimate for a work the following data are necessary- Drawing, Specification and \_\_\_\_.

  - a) materials
  - b) Rates
  - c) labours
  - d) Transportation



Seat No.	
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Set **R**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Engineering Economics, Estimation & Costing**

Day &amp; Date: Wednesday, 25-01-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) From Section – I Q. 2 is compulsory. Attempt any two out of Q. 3 to Q. 5.  
 2) From Section – II Q. 6 is compulsory. Attempt any two out of Q.7 to Q. 9.  
 3) Figures to the right indicates full marks

**Section – I**

- Q.2**    **A)**    Prepare a measurement sheet for the following items of construction of a compound wall around a plot of 6.50m × 12.20m. Assume the following specifications for the following items. **08**
- a)    Excavation Trench for foundation: Width=0.60m, Depth below GL=1.000m
- b)    PCC(M10) 0.10 thick below foundation: Width=0.60m,
- c)    UCR in foundation height = 0.800m
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- B)**    Also prepare an Abstract sheet for these items by assuming suitable market rates. **04**
- Q.3**    **A)**    What are thumb rules for determining the following quantities of materials? **04**
- a)    No.of cement bags required for construction of building
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- B)**    Detailed specifications for buildings. **04**
- Q.4**    Carry out Rate analysis of following items of work **08**
- a)    Plane Cement Concrete (M10) in Foundation
- b)    UCR in Foundation
- Q.5**    Compare following methods of calculating depreciation **08**
- a)    Straight line method, declining balance method.
- b)    Sinking fund method, quantity survey method

**Section - II**

- Q.6**    **A)**    Prepare a tender notice for the work of construction of your house of G+1 storied RCC structure of 100 Sqm built up area. Make suitable assumptions for required data. **08**
- B)**    Compare Item Rate contract and Percentage rate contract. **04**
- Q.7**    Explain following Acts **08**
- a)    Minimum Wages Act
- b)    Workers Compensation Act

- |            |           |  |           |
|------------|-----------|--|-----------|
| <b>Q.8</b> | <b>a)</b> | Explain Belting Method of Valuation.   | <b>04</b> |
|            | <b>b)</b> | Calculate Years Purchase for a property with a useful life of 30 years if rate of interest is 5% per year. Assume rate of interest for sinking fund as 3%. | <b>04</b> |
|            |           |  |           |
| <b>Q.9</b> | <b>a)</b> | Enlist and Explain the 'Factors affecting valuation of properties'.  | <b>04</b> |
|            | <b>b)</b> | Enlist and explain the different types of values.  | <b>04</b> |

Seat No.	
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Set **S**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Engineering Economics, Estimation & Costing**

Day &amp; Date: Wednesday, 25-01-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Considers impact of cash flow even after payback period
  - a) Net present value
  - b) return on investment
  - c) Sensitivity analysis
  - d) simple payback period
- 2) The net present value (NPV) is
  - a) equal to the sum of the present values of all cash flows
  - b) equal to the sum of returns
  - c) equal to the sum of all cash flows
  - d) none of the above
- 3) While submitting a tender, the contractor is required to deposit some amount with the department as a guarantee of the tender known as
  - a) Earnest money
  - b) Bank Guarantee
  - c) Security Deposit
  - d) Caution money
- 4) In India the flexible pavement is designed as per
  - a) msa
  - b) Ksa
  - c) csa
  - d) Fsa
- 5) Make out an estimate for a work the following data are necessary- Drawing, Specification and \_\_\_\_\_.
  - a) materials
  - b) Rates
  - c) labours
  - d) Transportation
- 6) The quantity of sand required for RCC (1:2:4) for 15 cubic metres of work is \_\_\_\_\_.
  - a) 4.76 m<sup>3</sup>
  - b) 10.32 m<sup>3</sup>
  - c) 8.43 m<sup>3</sup>
  - d) 6.51 m<sup>3</sup>
- 7) Workout the years purchase of the property if the rate of interest is 6% per annum \_\_\_\_\_.
  - a) 6
  - b) 16.67
  - c) 0.1667
  - d) 0.06

- Page 14 of 16

Seat No.	
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Set **S**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Engineering Economics, Estimation & Costing**

Day &amp; Date: Wednesday, 25-01-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) From Section – I Q. 2 is compulsory. Attempt any two out of Q. 3 to Q. 5.  
 2) From Section – II Q. 6 is compulsory. Attempt any two out of Q.7 to Q. 9.  
 3) Figures to the right indicates full marks

**Section – I**

- Q.2**    **A)**    Prepare a measurement sheet for the following items of construction of a compound wall around a plot of 6.50m × 12.20m. Assume the following specifications for the following items. **08**
- a)**    Excavation Trench for foundation: Width=0.60m, Depth below GL=1.000m
- b)**    PCC(M10) 0.10 thick below foundation: Width=0.60m,
- c)**    UCR in foundation height = 0.800m
- d)**    PCC(M10) 0.10 thick above foundation
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- Q.3**    **A)**    What are thumb rules for determining the following quantities of materials? **04**
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- Q.4**    Carry out Rate analysis of following items of work **08**
- a)**    Plane Cement Concrete (M10) in Foundation
- b)**    UCR in Foundation
- Q.5**    Compare following methods of calculating depreciation **08**
- a)**    Straight line method, declining balance method.
- b)**    Sinking fund method, quantity survey method

**Section - II**

- Q.6**    **A)**    Prepare a tender notice for the work of construction of your house of G+1 storied RCC structure of 100 Sqm built up area. Make suitable assumptions for required data. **08**
- B)**    Compare Item Rate contract and Percentage rate contract. **04**
- Q.7**    Explain following Acts **08**
- a)**    Minimum Wages Act
- b)**    Workers Compensation Act

- |            |           |  |           |
|------------|-----------|--|-----------|
| <b>Q.8</b> | <b>a)</b> | Explain Belting Method of Valuation.   | <b>04</b> |
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|            |           |  |           |
| <b>Q.9</b> | <b>a)</b> | Enlist and Explain the 'Factors affecting valuation of properties'.  | <b>04</b> |
|            | <b>b)</b> | Enlist and explain the different types of values.  | <b>04</b> |

Seat No.	
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Set	P
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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Construction Engineering, Management & Construction Practices**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Crashing is \_\_\_\_\_.
  - a) Abandoning the project
  - b) Completing the project with all possible haste
  - c) Reduction in duration for few of the activities
  - d) Reducing cost of the project with all possible modifications
- 2) CPM method of network analysis is \_\_\_\_\_.
  - i) ideally suited for linearly extending works
  - ii) Meant essentially for R and D activities
  - iii) Activity Oriented
  - iv) Used for planning, scheduling and controlling purposes
  - a) i and ii
  - b) ii and iii
  - c) iii and iv
  - d) i and iv
- 3) Which one of the following is captured in the Work Breakdown Structure (WBS)?
  - a) The life cycle phases
  - b) The logical order of tasks
  - c) The scope of the project
  - d) Project costs
- 4) The critical path \_\_\_\_\_.
  - a) Is a path that operates from the starting node to the end node
  - b) Is a mixture of all paths
  - c) Is the longest path
  - d) Is the shortest path
- 5) Free float for any activity is defined as the difference between \_\_\_\_\_.
  - a) its earliest finish time and earliest start time for its successor activity
  - b) its latest start time and earliest start time
  - c) its latest finish time and earliest start time for its successor activity
  - d) its earliest finish time and latest start time for its successor activity
- 6) The time with which direct cost does not reduce with the increase in time is known as \_\_\_\_\_.
  - a) crash time
  - b) normal time
  - c) optimistic time
  - d) standard time

- 7) Independent float is the amount of time by which:
- a) Start of the activity can be delayed without affecting EST of subsequent activity
  - b) reduces the float of subsequent activities
  - c) completion of an activity can be delayed beyond EFT without affecting EST
  - d) completion of an activity can be delayed beyond earliest possible finishing time
- 8) According to Heinrich \_\_\_\_\_ % are unsafe conditions and \_\_\_\_\_ % are unsafe acts which are preventable.
- a) 10, 88 respectively
  - b) 2, 98 respectively
  - c) 98, 2 respectively
  - d) 88, 10 respectively
- 9) The very first thing you should do if you are the first to witness or discover an accident on the job site is to \_\_\_\_\_.
- a) Go find at least one co-worker to help you so you can work as a team
  - b) Go to the scene and help the person(s) injured
  - c) Find and fill out the necessary forms to document the incident
  - d) Activate the emergency response system
- 10) The highway accidents occur mostly at \_\_\_\_\_.
- a) Both day and night
  - b) Early morning hours
  - c) Night time
  - d) Day time
- 11) Which of these causes the most construction site fatalities?
- a) Electrocution
  - b) Trench collapses
  - c) Falls
  - d) Contact with chemicals
- 12) Which of the following earth moving machines has the shortest cycle time?
- a) Dragline
  - b) Hoe
  - c) Clamshell
  - d) Power Shovel
- 13) A \_\_\_\_\_ is very useful equipment and it can be used for construction work like to clear the site of work, to make the land level, etc.
- a) Scraper
  - b) Grader
  - c) Excavator
  - d) Bulldozer
- 14) In the production of prefabricated structures how does the material used in construction affect the element?
- a) material quality and economic design
  - b) smaller members
  - c) disuniting of members
  - d) Joints



Seat No.	
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Set **P**

**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Construction Engineering, Management & Construction Practices**

Day &amp; Date: Tuesday, 31-01-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Figures to the right indicates full marks.

2) Q. No. 2 is compulsory. Attempt any two questions from Q. No.3 to Q. No. 5.

3) Q. No. 6 is compulsory. Attempt any two questions from Q. No.7 to Q. No. 9.

**Section – I**

**Q.2** Find Project details in the following table. **12**

Activity	Duration (Days)	Precedence
1-2	4	-
1-3	5	-
2-3	3	1-2
3-4	7	1-3, 2-3

- a) Draw the Bar Chart.
- b) Draw the CPM Network.
- c) Show the Critical Path and Duration of the Project.

**Q.3** Answer the following questions. **08**

- a) Explain stepwise procedure of network compression using suitable example.
- b) What are the three time estimates in PERT? Explain how to calculate expected time using these three time estimates.

**Q.4** Compare. **08**

- a) CPM with PERT
- b) Resource leveling with Resource smoothing

**Q.5** Answer following questions. **08**

- a) What is BIM? Which software is available as BIM? Explain the output of BIM.
- b) Explain reports possible using MS Project software.

**Section – II**

**Q.6** Write detailed Notes on. **12**

- a) Power Shovel
- b) Bulldozer
- c) Scraper

**Q.7** Explain. **08**

- a) Safety Measures in Construction
- b) Safety- against accidents

**Q.8 Compare.**

- a) Tunnel formwork with Mivan formwork
- b) Tower Crane with Mobile Crane

**Q.9 Explain.**

- a) Explain use of Dredging Equipment.
- b) Stepwise procedure for construction of Diaphragm wall.

Seat No.	
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Set Q
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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Construction Engineering, Management & Construction Practices**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) According to Heinrich \_\_\_\_\_ % are unsafe conditions and \_\_\_\_\_ % are unsafe acts which are preventable.
 

a) 10, 88 respectively	b) 2, 98 respectively
c) 98, 2 respectively	d) 88, 10 respectively
- 2) The very first thing you should do if you are the first to witness or discover an accident on the job site is to \_\_\_\_\_.
 

a) Go find at least one co-worker to help you so you can work as a team
b) Go to the scene and help the person(s) injured
c) Find and fill out the necessary forms to document the incident
d) Activate the emergency response system
- 3) The highway accidents occur mostly at \_\_\_\_\_.
 

a) Both day and night	b) Early morning hours
c) Night time	d) Day time
- 4) Which of these causes the most construction site fatalities?
 

a) Electrocution	b) Trench collapses
c) Falls	d) Contact with chemicals
- 5) Which of the following earth moving machines has the shortest cycle time?
 

a) Dragline	b) Hoe
c) Clamshell	d) Power Shovel
- 6) A \_\_\_\_\_ is very useful equipment and it can be used for construction work like to clear the site of work, to make the land level, etc.
 

a) Scraper	b) Grader
c) Excavator	d) Bulldozer
- 7) In the production of prefabricated structures how does the material used in construction affect the element?
 

a) material quality and economic design
b) smaller members
c) disuniting of members
d) Joints

- 8) Crashing is \_\_\_\_\_.  
a) Abandoning the project  
b) Completing the project with all possible haste  
c) Reduction in duration for few of the activities  
d) Reducing cost of the project with all possible modifications
- 9) CPM method of network analysis is \_\_\_\_\_.  
i) ideally suited for linearly extending works  
ii) Meant essentially for R and D activities  
iii) Activity Oriented  
iv) Used for planning, scheduling and controlling purposes  
a) i and ii  
b) ii and iii  
c) iii and iv  
d) i and iv
- 10) Which one of the following is captured in the Work Breakdown Structure (WBS)?  
a) The life cycle phases  
b) The logical order of tasks  
c) The scope of the project  
d) Project costs
- 11) The critical path \_\_\_\_\_.  
a) Is a path that operates from the starting node to the end node  
b) Is a mixture of all paths  
c) Is the longest path  
d) Is the shortest path
- 12) Free float for any activity is defined as the difference between \_\_\_\_\_.  
a) its earliest finish time and earliest start time for its successor activity  
b) its latest start time and earliest start time  
c) its latest finish time and earliest start time for its successor activity  
d) its earliest finish time and latest start time for its successor activity
- 13) The time with which direct cost does not reduce with the increase in time is known as \_\_\_\_\_.  
a) crash time  
b) normal time  
c) optimistic time  
d) standard time
- 14) Independent float is the amount of time by which:  
a) Start of the activity can be delayed without affecting EST of subsequent activity  
b) reduces the float of subsequent activities  
c) completion of an activity can be delayed beyond EFT without affecting EST  
d) completion of an activity can be delayed beyond earliest possible finishing time

Seat No.	
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Set Q
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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Construction Engineering, Management & Construction Practices**

Day & Date: Tuesday, 31-01-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Figures to the right indicates full marks.  
 2) Q. No. 2 is compulsory. Attempt any two questions from Q. No.3 to Q. No. 5.  
 3) Q. No. 6 is compulsory. Attempt any two questions from Q. No.7 to Q. No. 9.

**Section – I**

**Q.2** Find Project details in the following table. **12**

Activity	Duration (Days)	Precedence
1-2	4	-
1-3	5	-
2-3	3	1-2
3-4	7	1-3, 2-3

- Draw the Bar Chart.
- Draw the CPM Network.
- Show the Critical Path and Duration of the Project.

**Q.3** Answer the following questions. **08**

- Explain stepwise procedure of network compression using suitable example.
- What are the three time estimates in PERT? Explain how to calculate expected time using these three time estimates.

**Q.4** Compare. **08**

- CPM with PERT
- Resource leveling with Resource smoothing

**Q.5** Answer following questions. **08**

- What is BIM? Which software is available as BIM? Explain the output of BIM.
- Explain reports possible using MS Project software.

**Section – II**

**Q.6** Write detailed Notes on. **12**

- Power Shovel
- Bulldozer
- Scraper

**Q.7** Explain. **08**

- Safety Measures in Construction
- Safety- against accidents

**08****Q.8 Compare.**

- a) Tunnel formwork with Mivan formwork
- b) Tower Crane with Mobile Crane

**Q.9 Explain.****08**

- a) Explain use of Dredging Equipment.
- b) Stepwise procedure for construction of Diaphragm wall.

Seat No.	
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Set	R
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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Construction Engineering, Management & Construction Practices**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of these causes the most construction site fatalities?
  - a) Electrocution
  - b) Trench collapses
  - c) Falls
  - d) Contact with chemicals
- 2) Which of the following earth moving machines has the shortest cycle time?
  - a) Dragline
  - b) Hoe
  - c) Clamshell
  - d) Power Shovel
- 3) A \_\_\_\_\_ is very useful equipment and it can be used for construction work like to clear the site of work, to make the land level, etc.
  - a) Scraper
  - b) Grader
  - c) Excavator
  - d) Bulldozer
- 4) In the production of prefabricated structures how does the material used in construction affect the element?
  - a) material quality and economic design
  - b) smaller members
  - c) disuniting of members
  - d) Joints
- 5) Crashing is \_\_\_\_\_.
  - a) Abandoning the project
  - b) Completing the project with all possible haste
  - c) Reduction in duration for few of the activities
  - d) Reducing cost of the project with all possible modifications
- 6) CPM method of network analysis is \_\_\_\_\_.
  - i) ideally suited for linearly extending works
  - ii) Meant essentially for R and D activities
  - iii) Activity Oriented
  - iv) Used for planning, scheduling and controlling purposes
  - a) i and ii
  - b) ii and iii
  - c) iii and iv
  - d) i and iv

- 7) Which one of the following is captured in the Work Breakdown Structure (WBS)?
- a) The life cycle phases
  - b) The logical order of tasks
  - c) The scope of the project
  - d) Project costs
- 8) The critical path \_\_\_\_\_.  
a) Is a path that operates from the starting node to the end node  
b) Is a mixture of all paths  
c) Is the longest path  
d) Is the shortest path
- 9) Free float for any activity is defined as the difference between \_\_\_\_\_.  
a) its earliest finish time and earliest start time for its successor activity  
b) its latest start time and earliest start time  
c) its latest finish time and earliest start time for its successor activity  
d) its earliest finish time and latest start time for its successor activity
- 10) The time with which direct cost does not reduce with the increase in time is known as \_\_\_\_\_.  
a) crash time  
b) normal time  
c) optimistic time  
d) standard time
- 11) Independent float is the amount of time by which:  
a) Start of the activity can be delayed without affecting EST of subsequent activity  
b) reduces the float of subsequent activities  
c) completion of an activity can be delayed beyond EFT without affecting EST  
d) completion of an activity can be delayed beyond earliest possible finishing time
- 12) According to Heinrich \_\_\_\_\_ % are unsafe conditions and \_\_\_\_\_ % are unsafe acts which are preventable.  
a) 10, 88 respectively  
b) 2, 98 respectively  
c) 98, 2 respectively  
d) 88, 10 respectively
- 13) The very first thing you should do if you are the first to witness or discover an accident on the job site is to \_\_\_\_\_.  
a) Go find at least one co-worker to help you so you can work as a team  
b) Go to the scene and help the person(s) injured  
c) Find and fill out the necessary forms to document the incident  
d) Activate the emergency response system
- 14) The highway accidents occur mostly at \_\_\_\_\_.  
a) Both day and night  
b) Early morning hours  
c) Night time  
d) Day time



Seat No.	
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Set **R**

**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Construction Engineering, Management & Construction Practices**

Day &amp; Date: Tuesday, 31-01-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Figures to the right indicates full marks.  
 2) Q. No. 2 is compulsory. Attempt any two questions from Q. No.3 to Q. No. 5.  
 3) Q. No. 6 is compulsory. Attempt any two questions from Q. No.7 to Q. No. 9.

**Section – I**

**Q.2** Find Project details in the following table. **12**

Activity	Duration (Days)	Precedence
1-2	4	-
1-3	5	-
2-3	3	1-2
3-4	7	1-3, 2-3

- Draw the Bar Chart.
- Draw the CPM Network.
- Show the Critical Path and Duration of the Project.

**Q.3** Answer the following questions. **08**

- Explain stepwise procedure of network compression using suitable example.
- What are the three time estimates in PERT? Explain how to calculate expected time using these three time estimates.

**Q.4** Compare. **08**

- CPM with PERT
- Resource leveling with Resource smoothing

**Q.5** Answer following questions. **08**

- What is BIM? Which software is available as BIM? Explain the output of BIM.
- Explain reports possible using MS Project software.

**Section – II**

**Q.6** Write detailed Notes on. **12**

- Power Shovel
- Bulldozer
- Scraper

**Q.7** Explain. **08**

- Safety Measures in Construction
- Safety- against accidents

**08****Q.8 Compare.**

- a) Tunnel formwork with Mivan formwork
- b) Tower Crane with Mobile Crane

**08****Q.9 Explain.**

- a) Explain use of Dredging Equipment.
- b) Stepwise procedure for construction of Diaphragm wall.

<b>Seat No.</b>	
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## Construction Engineering, Management & Construction Practices

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- 1) The time with which direct cost does not reduce with the increase in time is known as \_\_\_\_\_.
  - a) crash time
  - b) normal time
  - c) optimistic time
  - d) standard time
- 2) Independent float is the amount of time by which:
  - a) Start of the activity can be delayed without affecting EST of subsequent activity
  - b) reduces the float of subsequent activities
  - c) completion of an activity can be delayed beyond EFT without affecting EST
  - d) completion of an activity can be delayed beyond earliest possible finishing time
- 3) According to Heinrich \_\_\_\_\_ % are unsafe conditions and \_\_\_\_\_ % are unsafe acts which are preventable.
  - a) 10, 88 respectively
  - b) 2, 98 respectively
  - c) 98, 2 respectively
  - d) 88, 10 respectively
- 4) The very first thing you should do if you are the first to witness or discover an accident on the job site is to \_\_\_\_\_.
  - a) Go find at least one co-worker to help you so you can work as a team
  - b) Go to the scene and help the person(s) injured
  - c) Find and fill out the necessary forms to document the incident
  - d) Activate the emergency response system
- 5) The highway accidents occur mostly at \_\_\_\_\_.
  - a) Both day and night
  - b) Early morning hours
  - c) Night time
  - d) Day time
- 6) Which of these causes the most construction site fatalities?
  - a) Electrocution
  - b) Trench collapses
  - c) Falls
  - d) Contact with chemicals

- 7) Which of the following earth moving machines has the shortest cycle time?
- a) Dragline
  - b) Hoe
  - c) Clamshell
  - d) Power Shovel
- 8) A \_\_\_\_\_ is very useful equipment and it can be used for construction work like to clear the site of work, to make the land level, etc.
- a) Scraper
  - b) Grader
  - c) Excavator
  - d) Bulldozer
- 9) In the production of prefabricated structures how does the material used in construction affect the element?
- a) material quality and economic design
  - b) smaller members
  - c) disuniting of members
  - d) Joints
- 10) Crashing is \_\_\_\_\_.
- a) Abandoning the project
  - b) Completing the project with all possible haste
  - c) Reduction in duration for few of the activities
  - d) Reducing cost of the project with all possible modifications
- 11) CPM method of network analysis is \_\_\_\_\_.
- i) ideally suited for linearly extending works
  - ii) Meant essentially for R and D activities
  - iii) Activity Oriented
  - iv) Used for planning, scheduling and controlling purposes
- a) i and ii
  - b) ii and iii
  - c) iii and iv
  - d) i and iv
- 12) Which one of the following is captured in the Work Breakdown Structure (WBS)?
- a) The life cycle phases
  - b) The logical order of tasks
  - c) The scope of the project
  - d) Project costs
- 13) The critical path \_\_\_\_\_.
- a) Is a path that operates from the starting node to the end node
  - b) Is a mixture of all paths
  - c) Is the longest path
  - d) Is the shortest path
- 14) Free float for any activity is defined as the difference between \_\_\_\_\_.
- a) its earliest finish time and earliest start time for its successor activity
  - b) its latest start time and earliest start time
  - c) its latest finish time and earliest start time for its successor activity
  - d) its earliest finish time and latest start time for its successor activity

Seat No.	
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Set	S
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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Construction Engineering, Management & Construction Practices**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks.  
 2) Q. No. 2 is compulsory. Attempt any two questions from Q. No.3 to Q. No. 5.  
 3) Q. No. 6 is compulsory. Attempt any two questions from Q. No.7 to Q. No. 9.

**Section – I**

**Q.2** Find Project details in the following table. **12**

Activity	Duration (Days)	Precedence
1-2	4	-
1-3	5	-
2-3	3	1-2
3-4	7	1-3, 2-3

- Draw the Bar Chart.
- Draw the CPM Network.
- Show the Critical Path and Duration of the Project.

**Q.3** Answer the following questions. **08**

- Explain stepwise procedure of network compression using suitable example.
- What are the three time estimates in PERT? Explain how to calculate expected time using these three time estimates.

**Q.4** Compare. **08**

- CPM with PERT
- Resource leveling with Resource smoothing

**Q.5** Answer following questions. **08**

- What is BIM? Which software is available as BIM? Explain the output of BIM.
- Explain reports possible using MS Project software.

**Section – II**

**Q.6** Write detailed Notes on. **12**

- Power Shovel
- Bulldozer
- Scraper

**Q.7** Explain. **08**

- Safety Measures in Construction
- Safety- against accidents

**Q.8 Compare.**

- a) Tunnel formwork with Mivan formwork
- b) Tower Crane with Mobile Crane

**Q.9 Explain.**

- a) Explain use of Dredging Equipment.
- b) Stepwise procedure for construction of Diaphragm wall.

Seat No.	
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Set	P
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures - II**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book).  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Write the correct option for each question.  
 4) While solving MCQ IS 456-2000, IS 1343 are not allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**
- 1) In design of a footing, the depth considering bending moment is checked at \_\_\_\_\_. **01**
    - a) The free end of footing
    - b) Face of the column
    - c) A distance  $d/2$  (half of the effective depth) from the face of the column
    - d) None of these
  - 2) For the design of vertical wall of height H for a circular tank the cantilever action considered for a height 'h' is \_\_\_\_\_ from the bottom of tank. **01**
    - a)  $H/3$
    - b) 1 m
    - c) Both a and b
    - d)  $H/3$  or 1 m whichever is more
  - 3) The horizontal portion of a step in a stairs case, is known as \_\_\_\_\_. **01**
    - a) Rise
    - b) Tread
    - c) Winder
    - d) Flight
  - 4) In a counter fort retaining wall, the main reinforcement in the stem at mid span is provided on \_\_\_\_\_. **01**
    - a) Front face only
    - b) Inner face only
    - c) Both front face and inner face
    - d) None of the above
  - 5) The minimum width of stem slab at bottom is \_\_\_\_\_. **01**
    - a)  $H/15$
    - b)  $H/12$
    - c)  $H/18$
    - d)  $H/20$
  - 6) Line along which the total resultant prestressing force acts is called as \_\_\_\_\_. **01**
    - a) Kern point
    - b) Cable profile
    - c) Cable line
    - d) Cable
  - 7) A pre-stressed concrete member is preferred because \_\_\_\_\_. **01**
    - a) Its dimensions are not decided from the diagonal tensile stress
    - b) Large size of long beams carrying large shear force need not be adopted
    - c) Removal of cracks in the members due to shrinkage
    - d) All the above

- 8) The algebraic sum of bending moments due to prestress and external loads is called as \_\_\_\_\_. **01**  
a) Primary prestressing moment      b) Secondary prestressing moment  
c) Resulting moment                      d) All of above
- 9) A square isolated footing for a square column of size 300mm x 300mm is made to transfer the characteristic load,  $P = 800\text{kN}$  to the ground. Consider weight of footing as 10% of the characteristic axial load. The safe bearing capacity of soil is  $155\text{ kN/m}^2$ . The dimension of the square footing should not be less than \_\_\_\_\_. **02**  
a) 956mm                                      b) 1434mm  
c) 1912mm                                      d) 2390mm
- 10) A rectangular pretensioned prestressed concrete beam has straight concentric force with a prestressing force of 1000 kN. The beam is 300 mm X 500 mm in section. M20 grade concrete is used. The loss of prestress due to elastic shortening is \_\_\_\_\_. **02**  
a) 22.37 MPa                                      b) 32.47 MPa  
c) 48.33 MPa                                      d) 52.33 MPa
- 11) The floor to floor height of a building is 3.0m. The tread depth of a step is 250mm and the rise height of a step is 150mm. The total number of steps to be provided for accessing next floor is equal to \_\_\_\_\_. **02**  
a) 18    b) 19  
c) 20    d) 21



<b>Seat No.</b>	
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures- II**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Draw neat sketch's where required and Assume suitable data if required and slate it clearly.  
 2) Figures to the right indicates full marks  
 3) Q. No. 2 and Q. No. 6 are compulsory.  
 4) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 from each section.  
 5) Use of IS 456, IS 1343 and IS 3370 part IV and non-programmable calculator is allowed.

**Section – I**

- Q.2** The dog-legged staircase for building in which the vertical distance between floors is 3.2 m. The live load is taken as 4 kN/m<sup>2</sup> including floor finish. Assume 150 mm riser and 250 mm tread and width of stair is 1.20 m. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. Stair is supported by beams of width 230 mm at the end of landing slab. **08**
- Q.3** Design the stem slab of a cantilever retaining wall to retain an earth embankment with a horizontal top 3.6 m above ground level. SBC of soil is 220 kN/m<sup>2</sup>, angle of friction  $\phi = 30^\circ$  and density of earth 17 kN/m<sup>3</sup>. coefficient of friction between concrete and ground 0.5. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**
- Q.4** A square column 420 mm X 420 mm carries an axial load of 1400 kN. Design square footing to support the column. The SBC of soil is 200 kN/m<sup>2</sup>. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **10**
- Q.5** Design a water tank having capacity 52200 liters, resting on firm ground is free at top, bottom as well as vertical edges are fixed, the depth of water is 3.2 m, Assume free board of 300 mm and solve by IS code method. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**

**Section – II**

- Q.6** A prestressed concrete beam 400 mm x 600 mm in section has a span 6 m and is subjected to a uniformly distributed load of 6 kN/m and a concentrated load of 150 kN at mid span. The prestressing tendons are located at 150 mm from bottom of the section. If prestressing force is 1200 kN, calculate the extreme stresses in concrete for the mid span section. Solve by following methods: stress concept method, strain concept method, load balancing concept. **08**
- Q.7** A rectangular prestressed concrete beam has span of 10 m and has to carry a live load of 16 kN/m excluding the self weight of beam. Given  $f_c = 15 \text{ N/mm}^2$  and  $f_s = 1000 \text{ N/mm}^2$ . Design the beam using 6 mm tendons. Weight of concrete is 24 kN/m<sup>3</sup> **10**

- Q.8** A prestressed concrete beam 250 wide and 650 mm deep is subjected to an effective prestressing force of 1345 kN along the longitudinal centroidal axis. The cable may be assumed to be symmetrically placed over mild steel anchor plate in an area 150 mm X 350 mm. Design the end block by IS code method. **10**
- Q.9** A pretensioned beam 250 mm wide and 360 mm deep is prestressed by 10 wires of 8 mm diameter initially stressed to 1050 N/mm<sup>2</sup>. The centroid of the steel wires is located at 100 mm from the soffit. Determine the maximum stress in the concrete immediately after transfer allowing elastic shortening of concrete only at the level of the centroid of steel. If, however the concrete is subject to additional shortening due to creep and shrinkage and the steel is subject to a relaxation of stress of 5 percent, find the final percentage loss of stress in the steel wires. Take  $E_s = 210 \text{ N/mm}^2$ ,  $E_c = 36.85 \text{ N/mm}^2$ , creep coefficient  $\phi = 1.60$ , total residual shrinkage strain =  $3 \times 10^{-4}$ . **10**

**Seat  
No.**

## Design of Concrete Structures - II

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book).
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Write the correct option for each question.
- 4) While solving MCQ IS 456-2000, IS 1343 are not allowed.

### MCQ/Objective Type Questions

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The minimum width of stem slab at bottom is \_\_\_\_\_. **01**

a)  $H/15$                                   b)  $H/12$   
c)  $H/18$                                   d)  $H/20$
- 2) Line along which the total resultant prestressing force acts is called as \_\_\_\_\_. **01**

a) Kern point                              b) Cable profile  
c) Cable line                                d) Cable
- 3) A pre-stressed concrete member is preferred because \_\_\_\_\_. **01**

a) Its dimensions are not decided from the diagonal tensile stress  
b) Large size of long beams carrying large shear force need not be adopted  
c) Removal of cracks in the members due to shrinkage  
d) All the above
- 4) The algebraic sum of bending moments due to prestress and external loads is called as \_\_\_\_\_. **01**

a) Primary prestressing moment      b) Secondary prestressing moment  
c) Resulting moment                    d) All of above
- 5) In design of a footing, the depth considering bending moment is checked at \_\_\_\_\_. **01**

a) The free end of footing  
b) Face of the column  
c) A distance  $d/2$  (half of the effective depth) from the face of the column  
d) None of these
- 6) For the design of vertical wall of height H for a circular tank the cantilever action considered for a height 'h' is \_\_\_\_\_ from the bottom of tank. **01**

a)  $H/3$                                         b) 1 m  
c) Both a and b                            d)  $H/3$  or 1 m whichever is more
- 7) The horizontal portion of a step in a stairs case, is known as \_\_\_\_\_. **01**

a) Rise                                        b) Tread  
c) Winder                                    d) Flight

- 8) In a counter fort retaining wall, the main reinforcement in the stem at mid span is provided on \_\_\_\_\_. **01**  
a) Front face only                      b) Inner face only  
c) Both front face and inner face    d) None of the above
- 9) A rectangular pretensioned prestressed concrete beam has straight concentric force with a prestressing force of 1000 kN. The beam is 300 mm X 500 mm in section. M20 grade concrete is used. The loss of prestress due to elastic shortening is \_\_\_\_\_. **02**  
a) 22.37 MPa                              b) 32.47 MPa  
c) 48.33 MPa                              d) 52.33 MPa
- 10) The floor to floor height of a building is 3.0m. The tread depth of a step is 250mm and the rise height of a step is 150mm. The total number of steps to be provided for accessing next floor is equal to \_\_\_\_\_. **02**  
a) 18    b) 19  
c) 20    d) 21
- 11) A square isolated footing for a square column of size 300mm x 300mm is made to transfer the characteristic load,  $P = 800\text{kN}$  to the ground. Consider weight of footing as 10% of the characteristic axial load. The safe bearing capacity of soil is  $155\text{ kN/m}^2$ . The dimension of the square footing should not be less than \_\_\_\_\_. **02**  
a) 956mm                                    b) 1434mm  
c) 1912mm                                   d) 2390mm

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures- II**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Draw neat sketch's where required and Assume suitable data if required and slate it clearly.  
 2) Figures to the right indicates full marks  
 3) Q. No. 2 and Q. No. 6 are compulsory.  
 4) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 from each section.  
 5) Use of IS 456, IS 1343 and IS 3370 part IV and non-programmable calculator is allowed.

**Section – I**

- Q.2** The dog-legged staircase for building in which the vertical distance between floors is 3.2 m. The live load is taken as 4 kN/m<sup>2</sup> including floor finish. Assume 150 mm riser and 250 mm tread and width of stair is 1.20 m. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. Stair is supported by beams of width 230 mm at the end of landing slab. **08**
- Q.3** Design the stem slab of a cantilever retaining wall to retain an earth embankment with a horizontal top 3.6 m above ground level. SBC of soil is 220 kN/m<sup>2</sup>, angle of friction  $\phi = 30^\circ$  and density of earth 17 kN/m<sup>3</sup>. coefficient of friction between concrete and ground 0.5. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**
- Q.4** A square column 420 mm X 420 mm carries an axial load of 1400 kN. Design square footing to support the column. The SBC of soil is 200 kN/m<sup>2</sup>. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **10**
- Q.5** Design a water tank having capacity 52200 liters, resting on firm ground is free at top, bottom as well as vertical edges are fixed, the depth of water is 3.2 m, Assume free board of 300 mm and solve by IS code method. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**

**Section – II**

- Q.6** A prestressed concrete beam 400 mm x 600 mm in section has a span 6 m and is subjected to a uniformly distributed load of 6 kN/m and a concentrated load of 150 kN at mid span. The prestressing tendons are located at 150 mm from bottom of the section. If prestressing force is 1200 kN, calculate the extreme stresses in concrete for the mid span section. Solve by following methods: stress concept method, strain concept method, load balancing concept. **08**
- Q.7** A rectangular prestressed concrete beam has span of 10 m and has to carry a live load of 16 kN/m excluding the self weight of beam. Given  $f_c = 15 \text{ N/mm}^2$  and  $f_s = 1000 \text{ N/mm}^2$ . Design the beam using 6 mm tendons. Weight of concrete is 24 kN/m<sup>3</sup> **10**

- Q.8** A prestressed concrete beam 250 wide and 650 mm deep is subjected to an effective prestressing force of 1345 kN along the longitudinal centroidal axis. The cable may be assumed to be symmetrically placed over mild steel anchor plate in an area 150 mm X 350 mm. Design the end block by IS code method. **10**
- Q.9** A pretensioned beam 250 mm wide and 360 mm deep is prestressed by 10 wires of 8 mm diameter initially stressed to 1050 N/mm<sup>2</sup>. The centroid of the steel wires is located at 100 mm from the soffit. Determine the maximum stress in the concrete immediately after transfer allowing elastic shortening of concrete only at the level of the centroid of steel. If, however the concrete is subject to additional shortening due to creep and shrinkage and the steel is subject to a relaxation of stress of 5 percent, find the final percentage loss of stress in the steel wires. Take  $E_s = 210 \text{ N/mm}^2$ ,  $E_c = 36.85 \text{ N/mm}^2$ , creep coefficient  $\phi = 1.60$ , total residual shrinkage strain =  $3 \times 10^{-4}$ . **10**

**Seat  
No.**

## Design of Concrete Structures - II

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book).
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Write the correct option for each question.
- 4) While solving MCQ IS 456-2000, IS 1343 are not allowed.

### MCQ/Objective Type Questions

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The horizontal portion of a step in a stairs case, is known as \_\_\_\_\_. **01**

a) Rise                                      b) Tread  
c) Winder                                  d) Flight
- 2) In a counter fort retaining wall, the main reinforcement in the stem at mid span is provided on \_\_\_\_\_. **01**

a) Front face only                      b) Inner face only  
c) Both front face and inner face    d) None of the above
- 3) The minimum width of stem slab at bottom is \_\_\_\_\_. **01**

a) H/15                                      b) H/12  
c) H/18                                      d) H/20
- 4) Line along which the total resultant prestressing force acts is called as \_\_\_\_\_. **01**

a) Kern point                              b) Cable profile  
c) Cable line                                d) Cable
- 5) A pre-stressed concrete member is preferred because \_\_\_\_\_. **01**

a) Its dimensions are not decided from the diagonal tensile stress  
b) Large size of long beams carrying large shear force need not be adopted  
c) Removal of cracks in the members due to shrinkage  
d) All the above
- 6) The algebraic sum of bending moments due to prestress and external loads is called as \_\_\_\_\_. **01**

a) Primary prestressing moment      b) Secondary prestressing moment  
c) Resulting moment                    d) All of above
- 7) In design of a footing, the depth considering bending moment is checked at \_\_\_\_\_. **01**

a) The free end of footing  
b) Face of the column  
c) A distance  $d/2$  (half of the effective depth) from the face of the column  
d) None of these

- 8)** For the design of vertical wall of height H for a circular tank the cantilever action considered for a height 'h' is \_\_\_\_\_ from the bottom of tank. **01**

  - H/3
  - 1 m
  - Both a and b
  - H/3 or 1 m whichever is more

**9)** The floor to floor height of a building is 3.0m. The tread depth of a step is 250mm and the rise height of a step is 150mm. The total number of steps to be provided for accessing next floor is equal to \_\_\_\_\_. **02**

  - 18
  - 19
  - 20
  - 21

**10)** A square isolated footing for a square column of size 300mm x 300mm is made to transfer the characteristic load, P = 800kN to the ground. Consider weight of footing as 10% of the characteristic axial load. The safe bearing capacity of soil is 155 kN/m<sup>2</sup>. The dimension of the square footing should not be less than \_\_\_\_\_. **02**

  - 956mm
  - 1434mm
  - 1912mm
  - 2390mm

**11)** A rectangular pretensioned prestressed concrete beam has straight concentric force with a prestressing force of 1000 kN. The beam is 300 mm X 500 mm in section. M20 grade concrete is used. The loss of prestress due to elastic shortening is \_\_\_\_\_. **02**

  - 22.37 MPa
  - 32.47 MPa
  - 48.33 MPa
  - 52.33 MPa



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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures- II**

Day &amp; Date: Friday, 17-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Draw neat sketch's where required and Assume suitable data if required and slate it clearly.  
 2) Figures to the right indicates full marks  
 3) Q. No. 2 and Q. No. 6 are compulsory.  
 4) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 from each section.  
 5) Use of IS 456, IS 1343 and IS 3370 part IV and non-programmable calculator is allowed.

**Section – I**

- Q.2** The dog-legged staircase for building in which the vertical distance between floors is 3.2 m. The live load is taken as 4 kN/m<sup>2</sup> including floor finish. Assume 150 mm riser and 250 mm tread and width of stair is 1.20 m. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. Stair is supported by beams of width 230 mm at the end of landing slab. **08**
- Q.3** Design the stem slab of a cantilever retaining wall to retain an earth embankment with a horizontal top 3.6 m above ground level. SBC of soil is 220 kN/m<sup>2</sup>, angle of friction  $\phi = 30^\circ$  and density of earth 17 kN/m<sup>3</sup>. coefficient of friction between concrete and ground 0.5. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**
- Q.4** A square column 420 mm X 420 mm carries an axial load of 1400 kN. Design square footing to support the column. The SBC of soil is 200 kN/m<sup>2</sup>. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **10**
- Q.5** Design a water tank having capacity 52200 liters, resting on firm ground is free at top, bottom as well as vertical edges are fixed, the depth of water is 3.2 m, Assume free board of 300 mm and solve by IS code method. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**

**Section – II**

- Q.6** A prestressed concrete beam 400 mm x 600 mm in section has a span 6 m and is subjected to a uniformly distributed load of 6 kN/m and a concentrated load of 150 kN at mid span. The prestressing tendons are located at 150 mm from bottom of the section. If prestressing force is 1200 kN, calculate the extreme stresses in concrete for the mid span section. Solve by following methods: stress concept method, strain concept method, load balancing concept. **08**
- Q.7** A rectangular prestressed concrete beam has span of 10 m and has to carry a live load of 16 kN/m excluding the self weight of beam. Given  $f_c = 15 \text{ N/mm}^2$  and  $f_s = 1000 \text{ N/mm}^2$ . Design the beam using 6 mm tendons. Weight of concrete is 24 kN/m<sup>3</sup> **10**

- Q.8** A prestressed concrete beam 250 wide and 650 mm deep is subjected to an effective prestressing force of 1345 kN along the longitudinal centroidal axis. The cable may be assumed to be symmetrically placed over mild steel anchor plate in an area 150 mm X 350 mm. Design the end block by IS code method. **10**
- Q.9** A pretensioned beam 250 mm wide and 360 mm deep is prestressed by 10 wires of 8 mm diameter initially stressed to 1050 N/mm<sup>2</sup>. The centroid of the steel wires is located at 100 mm from the soffit. Determine the maximum stress in the concrete immediately after transfer allowing elastic shortening of concrete only at the level of the centroid of steel. If, however the concrete is subject to additional shortening due to creep and shrinkage and the steel is subject to a relaxation of stress of 5 percent, find the final percentage loss of stress in the steel wires. Take  $E_s = 210 \text{ N/mm}^2$ ,  $E_c = 36.85 \text{ N/mm}^2$ , creep coefficient  $\phi = 1.60$ , total residual shrinkage strain =  $3 \times 10^{-4}$ . **10**

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**  
**Design of Concrete Structures - II**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book).  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Write the correct option for each question.  
 4) While solving MCQ IS 456-2000, IS 1343 are not allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) A pre-stressed concrete member is preferred because \_\_\_\_\_. **01**
  - a) Its dimensions are not decided from the diagonal tensile stress
  - b) Large size of long beams carrying large shear force need not be adopted
  - c) Removal of cracks in the members due to shrinkage
  - d) All the above
- 2) The algebraic sum of bending moments due to prestress and external loads is called as \_\_\_\_\_. **01**
  - a) Primary prestressing moment
  - b) Secondary prestressing moment
  - c) Resulting moment
  - d) All of above
- 3) In design of a footing, the depth considering bending moment is checked at \_\_\_\_\_. **01**
  - a) The free end of footing
  - b) Face of the column
  - c) A distance  $d/2$  (half of the effective depth) from the face of the column
  - d) None of these
- 4) For the design of vertical wall of height H for a circular tank the cantilever action considered for a height 'h' is \_\_\_\_\_ from the bottom of tank. **01**
  - a)  $H/3$
  - b) 1 m
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  - d)  $H/3$  or 1 m whichever is more
- 5) The horizontal portion of a step in a stairs case, is known as \_\_\_\_\_. **01**
  - a) Rise
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- 6) In a counter fort retaining wall, the main reinforcement in the stem at mid span is provided on \_\_\_\_\_. **01**
  - a) Front face only
  - b) Inner face only
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  - d) None of the above
- 7) The minimum width of stem slab at bottom is \_\_\_\_\_. **01**
  - a)  $H/15$
  - b)  $H/12$
  - c)  $H/18$
  - d)  $H/20$

- 8)** Line along which the total resultant prestressing force acts is called as \_\_\_\_\_. **01**

a) Kern point                                      b) Cable profile  
c) Cable line                                        d) Cable

**9)** A square isolated footing for a square column of size 300mm x 300mm is made to transfer the characteristic load,  $P = 800\text{kN}$  to the ground. Consider weight of footing as 10% of the characteristic axial load. The safe bearing capacity of soil is  $155 \text{ kN/m}^2$ . The dimension of the square footing should not be less than \_\_\_\_\_. **02**

a) 956mm    b) 1434mm  
c) 1912mm                                        d) 2390mm

**10)** A rectangular pretensioned prestressed concrete beam has straight concentric force with a prestressing force of 1000 kN. The beam is 300 mm X 500 mm in section. M20 grade concrete is used. The loss of prestress due to elastic shortening is \_\_\_\_\_. **02**

a) 22.37 MPa                                      b) 32.47 MPa  
c) 48.33 MPa                                      d) 52.33 MPa

**11)** The floor to floor height of a building is 3.0m. The tread depth of a step is 250mm and the rise height of a step is 150mm. The total number of steps to be provided for accessing next floor is equal to \_\_\_\_\_. **02**

a) 18    b) 19  
c) 20    d) 21

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**CIVIL ENGINEERING**

**Design of Concrete Structures- II**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Draw neat sketch's where required and Assume suitable data if required and slate it clearly.  
 2) Figures to the right indicates full marks  
 3) Q. No. 2 and Q. No. 6 are compulsory.  
 4) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 from each section.  
 5) Use of IS 456, IS 1343 and IS 3370 part IV and non-programmable calculator is allowed.

**Section – I**

- Q.2** The dog-legged staircase for building in which the vertical distance between floors is 3.2 m. The live load is taken as 4 kN/m<sup>2</sup> including floor finish. Assume 150 mm riser and 250 mm tread and width of stair is 1.20 m. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. Stair is supported by beams of width 230 mm at the end of landing slab. **08**
- Q.3** Design the stem slab of a cantilever retaining wall to retain an earth embankment with a horizontal top 3.6 m above ground level. SBC of soil is 220 kN/m<sup>2</sup>, angle of friction  $\phi = 30^\circ$  and density of earth 17 kN/m<sup>3</sup>. coefficient of friction between concrete and ground 0.5. Use M<sub>25</sub> concrete and Fe<sub>500</sub> steel. **10**
- Q.4** A square column 420 mm X 420 mm carries an axial load of 1400 kN. Design square footing to support the column. The SBC of soil is 200 kN/m<sup>2</sup>. Use M<sub>20</sub> concrete and Fe<sub>415</sub> steel. **10**
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**Section – II**

- Q.6** A prestressed concrete beam 400 mm x 600 mm in section has a span 6 m and is subjected to a uniformly distributed load of 6 kN/m and a concentrated load of 150 kN at mid span. The prestressing tendons are located at 150 mm from bottom of the section. If prestressing force is 1200 kN, calculate the extreme stresses in concrete for the mid span section. Solve by following methods: stress concept method, strain concept method, load balancing concept. **08**
- Q.7** A rectangular prestressed concrete beam has span of 10 m and has to carry a live load of 16 kN/m excluding the self weight of beam. Given  $f_c = 15 \text{ N/mm}^2$  and  $f_s = 1000 \text{ N/mm}^2$ . Design the beam using 6 mm tendons. Weight of concrete is 24 kN/m<sup>3</sup> **10**

- Q.8** A prestressed concrete beam 250 wide and 650 mm deep is subjected to an effective prestressing force of 1345 kN along the longitudinal centroidal axis. The cable may be assumed to be symmetrically placed over mild steel anchor plate in an area 150 mm X 350 mm. Design the end block by IS code method. **10**
- Q.9** A pretensioned beam 250 mm wide and 360 mm deep is prestressed by 10 wires of 8 mm diameter initially stressed to 1050 N/mm<sup>2</sup>. The centroid of the steel wires is located at 100 mm from the soffit. Determine the maximum stress in the concrete immediately after transfer allowing elastic shortening of concrete only at the level of the centroid of steel. If, however the concrete is subject to additional shortening due to creep and shrinkage and the steel is subject to a relaxation of stress of 5 percent, find the final percentage loss of stress in the steel wires. Take  $E_s = 210 \text{ N/mm}^2$ ,  $E_c = 36.85 \text{ N/mm}^2$ , creep coefficient  $\phi = 1.60$ , total residual shrinkage strain =  $3 \times 10^{-4}$ . **10**

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Earthquake Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book).  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Each MCQ carries two marks each.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The transmissibility is zero at the frequency ratio ( $\omega / \omega_n$ ) equal to
  - a) 0.5
  - b) 1.0
  - c)  $\sqrt{2}$
  - d)  $2^2$
- 2) The response is greatly affected by damping in the region
  - a)  $\omega / \omega_n < 0.5$
  - b)  $\omega / \omega_n > 1.5$
  - c)  $\omega / \omega_n = 0$
  - d)  $\omega / \omega_n = 1$
- 3) The increase in damping in a dynamic system, the transmissibility when the frequency ratio is equal to  $\sqrt{2}$ .
  - a) Decreases
  - b) Increases
  - c) Has no effect
  - d) None of above
- 4) A building structure suffers torsion under seismic action when
  - a) The centre of gravity does not coincide with the centre of rigidity
  - b) The centre of gravity does not coincide with the centre of stiffness
  - c) The centre of rigidity does not coincide with the centre of stiffness
  - d) The centre of gravity coincides with the centre of stiffness
- 5) \_\_\_\_\_ is the building structure which has least lateral force resistance.
  - a) Ordinary moment-resisting RCC frame
  - b) Special moment-resisting RCC frame
  - c) Shear wall structure
  - d) Masonry structure
- 6) The slenderness ratio of masonry is the ratio of
  - a) Length of wall to height of wall
  - b) Length of wall to thickness
  - c) Height of wall to area of cross-section
  - d) None of above
- 7) Special confining reinforcement is provided in the form of
  - a) Longitudinal reinforcement
  - b) Temperature reinforcement
  - c) Lateral reinforcement
  - d) Shrinkage reinforcement

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Earthquake Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

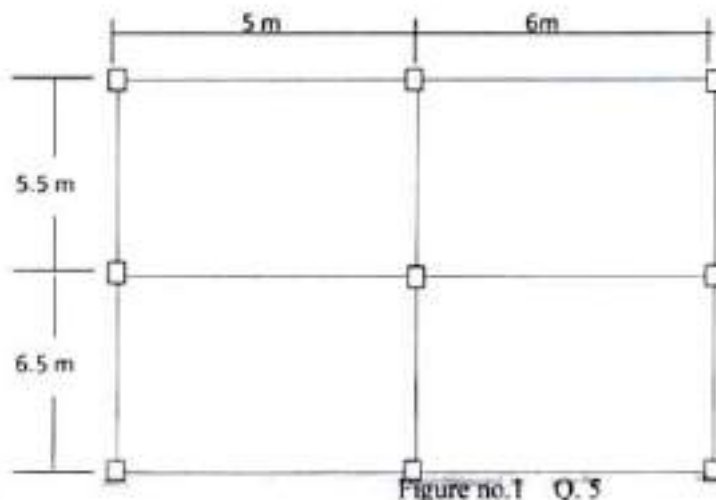
- Instructions:** 1) Q. 1 & Q. 5 are compulsory.  
 2) Attempt any two questions from the remaining of each section.  
 3) Use of only IS 1893:2016 is allowed.  
 4) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.1** Write detailed note on internal structure of Earth. **10**
- Q.2** From first principle derive the governing differential equation for forced vibration of a Undamped SDOF system. Obtain the general solution of this differential equation. **09**
- Q.3** What do you understand by force transmissibility? Derive an expression for force transmissibility to the foundation of a SDOF system subjected to harmonic force. **09**
- Q.4** a) Explain the step by step procedure of construction of response spectrum. **05**  
 b) What is combined spectrum? What are its characteristics? **04**

**Section – II**

- Q.5** It is proposed to construct a R.C.C. three storied residential building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 300 × 550 mm & beams sizes are 300 × 450 mm. The slab thickness is 120mm & thk. of walls is 230mm. The ht. of floor is 3.0 m & Live load is 3.5 kN/m<sup>2</sup>. IS 13920 provisions are incorporated in the structure. The strata is Medium. **10**





- Q.6** What do you understand by a response reduction factor? Why it is incorporated in the expression for evaluating seismic forces? **09**
- Q.7** Explain how rational ductility of singly reinforced and doubly reinforced RCC section is evaluated? **09**
- Q.8** Explain the strengthening arrangements for masonry construction. **09**

Seat No.	
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Set	Q
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Earthquake Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book).  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Each MCQ carries two marks each.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A building structure suffers torsion under seismic action when
  - a) The centre of gravity does not coincide with the centre of rigidity
  - b) The centre of gravity does not coincide with the centre of stiffness
  - c) The centre of rigidity does not coincide with the centre of stiffness
  - d) The centre of gravity coincides with the centre of stiffness
- 2) \_\_\_\_\_ is the building structure which has least lateral force resistance.
  - a) Ordinary moment-resisting RCC frame
  - b) Special moment-resisting RCC frame
  - c) Shear wall structure
  - d) Masonry structure
- 3) The slenderness ratio of masonry is the ratio of
  - a) Length of wall to height of wall
  - b) Length of wall to thickness
  - c) Height of wall to area of cross-section
  - d) None of above
- 4) Special confining reinforcement is provided in the form of
 

a) Longitudinal reinforcement	b) Temperature reinforcement
c) Lateral reinforcement	d) Shrinkage reinforcement
- 5) The transmissibility is zero at the frequency ratio ( $\omega / \omega_n$ ) equal to
 

a) 0.5	b) 1.0
c) $\sqrt{2}$	d) $2^2$
- 6) The response is greatly affected by damping in the region
 

a) $\omega / \omega_n < 0.5$	b) $\omega / \omega_n > 1.5$
c) $\omega / \omega_n = 0$	d) $\omega / \omega_n = 1$
- 7) The increase in damping in a dynamic system, the transmissibility when the frequency ratio is equal to  $\sqrt{2}$ .
 

a) Decreases	b) Increases
c) Has no effect	d) None of above

Seat No.	
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Set Q
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Earthquake Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

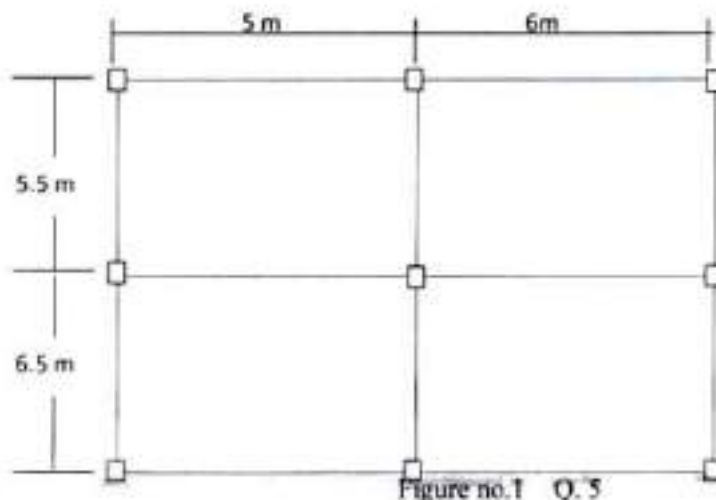
- Instructions:** 1) Q. 1 & Q. 5 are compulsory.  
 2) Attempt any two questions from the remaining of each section.  
 3) Use of only IS 1893:2016 is allowed.  
 4) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.1** Write detailed note on internal structure of Earth. **10**
- Q.2** From first principle derive the governing differential equation for forced vibration of a Undamped SDOF system. Obtain the general solution of this differential equation. **09**
- Q.3** What do you understand by force transmissibility? Derive an expression for force transmissibility to the foundation of a SDOF system subjected to harmonic force. **09**
- Q.4** a) Explain the step by step procedure of construction of response spectrum. **05**  
 b) What is combined spectrum? What are its characteristics? **04**

**Section – II**

- Q.5** It is proposed to construct a R.C.C. three storied residential building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 300 × 550 mm & beams sizes are 300 × 450 mm. The slab thickness is 120mm & thk. of walls is 230mm. The ht. of floor is 3.0 m & Live load is 3.5 kN/m<sup>2</sup>. IS 13920 provisions are incorporated in the structure. The strata is Medium. **10**



- Q.6** What do you understand by a response reduction factor? Why it is incorporated in the expression for evaluating seismic forces? **09**
- Q.7** Explain how rational ductility of singly reinforced and doubly reinforced RCC section is evaluated? **09**
- Q.8** Explain the strengthening arrangements for masonry construction. **09**

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Earthquake Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book).  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Each MCQ carries two marks each.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The slenderness ratio of masonry is the ratio of
  - a) Length of wall to height of wall
  - b) Length of wall to thickness
  - c) Height of wall to area of cross-section
  - d) None of above
- 2) Special confining reinforcement is provided in the form of
  - a) Longitudinal reinforcement      b) Temperature reinforcement
  - c) Lateral reinforcement              d) Shrinkage reinforcement
- 3) The transmissibility is zero at the frequency ratio ( $\omega / \omega_n$ ) equal to
  - a) 0.5                                      b) 1.0
  - c)  $\sqrt{2}$                                       d)  $2^2$
- 4) The response is greatly affected by damping in the region
  - a)  $\omega / \omega_n < 0.5$                               b)  $\omega / \omega_n > 1.5$
  - c)  $\omega / \omega_n = 0$                               d)  $\omega / \omega_n = 1$
- 5) The increase in damping in a dynamic system, the transmissibility when the frequency ratio is equal to  $\sqrt{2}$ .
  - a) Decreases                              b) Increases
  - c) Has no effect                              d) None of above
- 6) A building structure suffers torsion under seismic action when
  - a) The centre of gravity does not coincide with the centre of rigidity
  - b) The centre of gravity does not coincide with the centre of stiffness
  - c) The centre of rigidity does not coincide with the centre of stiffness
  - d) The centre of gravity coincides with the centre of stiffness
- 7) \_\_\_\_\_ is the building structure which has least lateral force resistance.
  - a) Ordinary moment-resisting RCC frame
  - b) Special moment-resisting RCC frame
  - c) Shear wall structure
  - d) Masonry structure

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Earthquake Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

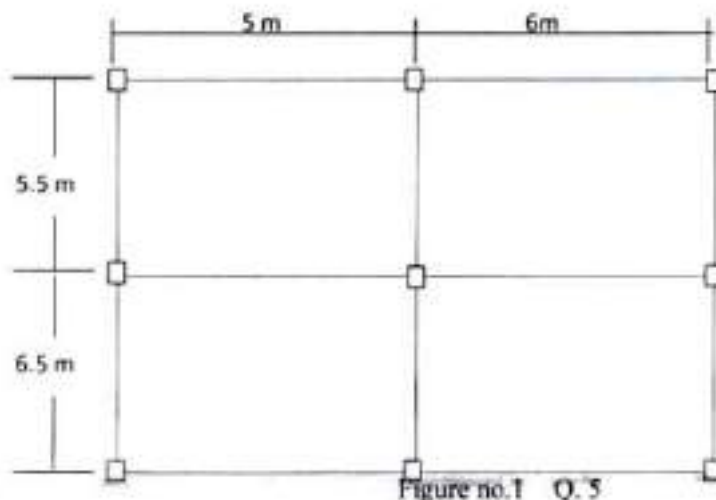
- Instructions:** 1) Q. 1 & Q. 5 are compulsory.  
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 3) Use of only IS 1893:2016 is allowed.  
 4) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.1** Write detailed note on internal structure of Earth. **10**
- Q.2** From first principle derive the governing differential equation for forced vibration of a Undamped SDOF system. Obtain the general solution of this differential equation. **09**
- Q.3** What do you understand by force transmissibility? Derive an expression for force transmissibility to the foundation of a SDOF system subjected to harmonic force. **09**
- Q.4** a) Explain the step by step procedure of construction of response spectrum. **05**  
 b) What is combined spectrum? What are its characteristics? **04**

**Section – II**

- Q.5** It is proposed to construct a R.C.C. three storied residential building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 300 × 550 mm & beams sizes are 300 × 450 mm. The slab thickness is 120mm & thk. of walls is 230mm. The ht. of floor is 3.0 m & Live load is 3.5 kN/m<sup>2</sup>. IS 13920 provisions are incorporated in the structure. The strata is Medium. **10**



- Q.6** What do you understand by a response reduction factor? Why it is incorporated in the expression for evaluating seismic forces? **09**
- Q.7** Explain how rational ductility of singly reinforced and doubly reinforced RCC section is evaluated? **09**
- Q.8** Explain the strengthening arrangements for masonry construction. **09**

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Earthquake Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book).  
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 3) Each MCQ carries two marks each.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The response is greatly affected by damping in the region
  - a)  $\omega / \omega_n < 0.5$
  - b)  $\omega / \omega_n > 1.5$
  - c)  $\omega / \omega_n = 0$
  - d)  $\omega / \omega_n = 1$
- 2) The increase in damping in a dynamic system, the transmissibility when the frequency ratio is equal to  $\sqrt{2}$ .
  - a) Decreases
  - b) Increases
  - c) Has no effect
  - d) None of above
- 3) A building structure suffers torsion under seismic action when
  - a) The centre of gravity does not coincide with the centre of rigidity
  - b) The centre of gravity does not coincide with the centre of stiffness
  - c) The centre of rigidity does not coincide with the centre of stiffness
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- 4) \_\_\_\_\_ is the building structure which has least lateral force resistance.
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  - a) Longitudinal reinforcement
  - b) Temperature reinforcement
  - c) Lateral reinforcement
  - d) Shrinkage reinforcement
- 7) The transmissibility is zero at the frequency ratio ( $\omega / \omega_n$ ) equal to
  - a) 0.5
  - b) 1.0
  - c)  $\sqrt{2}$
  - d)  $2^2$



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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Earthquake Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

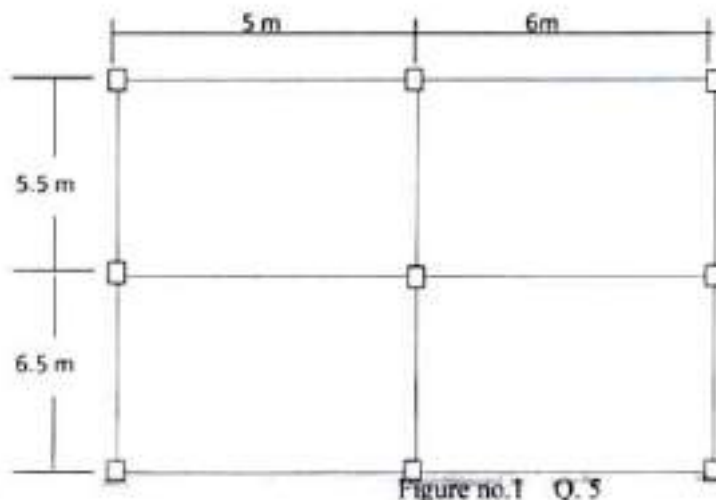
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**Section – I**

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**Section – II**

- Q.5** It is proposed to construct a R.C.C. three storied residential building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 300 × 550 mm & beams sizes are 300 × 450 mm. The slab thickness is 120mm & thk. of walls is 230mm. The ht. of floor is 3.0 m & Live load is 3.5 kN/m<sup>2</sup>. IS 13920 provisions are incorporated in the structure. The strata is Medium. **10**



- Q.6** What do you understand by a response reduction factor? Why it is incorporated in the expression for evaluating seismic forces? **09**
- Q.7** Explain how rational ductility of singly reinforced and doubly reinforced RCC section is evaluated? **09**
- Q.8** Explain the strengthening arrangements for masonry construction. **09**

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**Fourth. Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Civil ENGINEERING**

**Traffic Engineering and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Select the correct statement,
  - a) Traffic volume should always be more than traffic capacity
  - b) Traffic capacity should be always be more than traffic volume
  - c) Spot seed is the average speed of a vehicle at a specified section
  - d) 85<sup>th</sup> percentile speed is more than 98<sup>th</sup> percentile speed
- 2) The diagram which shows the approximate path of vehicles and pedestrians involved in accident is known as,
  - a) Spot maps
  - b) Pie charts
  - c) Condition diagram
  - d) Collision diagram
- 3) If the space headway is 7m, then the jam density in vehicle/km is \_\_\_\_\_.
  - a) 142
  - b) 144
  - c) 145
  - d) 146
- 4) If the jam density is 145vehicles/km, and velocity is 60kph then the capacity flow is \_\_\_\_\_.
  - a) 2175
  - b) 2200
  - c) 2375
  - d) 2500
- 5) Level of Service A and F represents \_\_\_\_\_.
  - a) Forced Flow and Free Flow respectively
  - b) Free Flow and Forced Flow respectively
  - c) Both are free flow
  - d) Both are Forced flow
- 6) With increase in speed of the traffic stream, the maximum capacity of the lane \_\_\_\_\_.
  - a) Increase
  - b) Decreases
  - c) first increases and then decreases after reaching a maximum value at optimum speed
  - d) first decreases and then increases after reaching a maximum value at optimum speed



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Set **P**

**Fourth. Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Civil ENGINEERING**

**Traffic Engineering and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any two questions (each carry 7 marks)**

**14**

- a) What are the objects and scope of traffic engineering? Explain briefly.  
 b) From an in-out survey conducted for a parking area consisting of 40 bays, the initial count was found to be 25. **Table-1** gives the result of the survey. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the **Table-1** below. Find the accumulation, total parking load, average occupancy and efficiency of the parking lot.

**Table-1-In-Out Survey data**

In-out survey data			In-out survey data		
Time	In	Out	Time	In	Out
5	3	2	35	2	7
10	2	4	40	4	2
15	4	2	45	6	4
20	5	4	50	4	1
25	7	3	55	3	3
30	8	2	60	2	5

- c) Explain Spot speed, running speed, Space-mean speed, time mean speed and average speed.  
 d) Write a short note on any two.  
 1) Level of Service  
 2) Passenger Car Unit  
 3) Collision and Condition Diagram  
 4) O-D survey

**Q.3 Answer any TWO questions (each carry 7 marks)**

**14**

- a) Explain the relationship between speed, travel time, volume, density and capacity?  
 b) Discuss the various types of on street parking with their advantages and disadvantages.  
 c) Define the term capacity. Explain terms basic capacity, possible capacity and practical capacity.  
 d) A vehicle skids through a distance equal to 40m before colliding with another parked vehicle, the weight of which is 60% of the former. After collision both the vehicles skid through 12m before stopping. Compute the initial speed of moving vehicle, assuming average friction coefficient,  $f=0.6$ .

## Section – II

**Q.4 Answer any two questions (each carry 7 marks)****14**

- a) Explain general principles governing application of speed limits in Rural and Urban area.
- b) With neat sketches show some of the important types of warning signs and mention the functions of each.
- c) Write a short note on ITS applications in urban transport system.
- d) A fixed type 2 - phase signal is to be provided at an intersection having a North - South and an East - West Road, where only straight-ahead traffic is permitted. The design hour flows from the various arms and the saturation flows for these arms are given in the following table.

Design hour	North	South	East	West
flow(q) in PCU s/hour	800	400	750	600
Saturation flow (s) in PCU s /hour	2400	2000	3000	3000

Calculate the optimum cycle time and green times for the minimum overall delay. Use Webster's method. Assume time lost per phase due to starting delays as 2 seconds and value of amber period is 2 seconds. Sketch the timing diagram for each phase.

**Q.5 Answer any TWO questions (each carry 7 marks)****14**

- a) What are the objects of highway lighting? Explain various design factors to be considered in road lighting.
- b) Marks the different signs for below locations as per IRC-67-2001.
- 1) Three arm priority junction
  - 2) Four arm priority junction
  - 3) Flyover approach in rural section
  - 4) Curve delineation in divided highway
- c) Explain with neat sketch.
- 1) Roadway Delineators
  - 2) Hazard Markers
  - 3) Safety Barriers

<b>Seat No.</b>	
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# Traffic Engineering and Management

Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

## 14

- Page 5 of 16

- 8) Select the correct statement,  
a) Traffic volume should always be more than traffic capacity  
b) Traffic capacity should be always be more than traffic volume  
c) Spot seed is the average speed of a vehicle at a specified section  
d) 85<sup>th</sup> percentile speed is more than 98<sup>th</sup> percentile speed
- 9) The diagram which shows the approximate path of vehicles and pedestrians involved in accident is known as,  
a) Spot maps  
b) Pie charts  
c) Condition diagram  
d) Collision diagram
- 10) If the space headway is 7m, then the jam density in vehicle/km is \_\_\_\_\_.  
a) 142  
b) 144  
c) 145  
d) 146
- 11) If the jam density is 145vehicles/km, and velocity is 60kph then the capacity flow is \_\_\_\_\_.  
a) 2175  
b) 2200  
c) 2375  
d) 2500
- 12) Level of Service A and F represents \_\_\_\_\_.  
a) Forced Flow and Free Flow respectively  
b) Free Flow and Forced Flow respectively  
c) Both are free flow  
d) Both are Forced flow
- 13) With increase in speed of the traffic stream, the maximum capacity of the lane \_\_\_\_\_.  
a) Increase  
b) Decreases  
c) first increases and then decreases after reaching a maximum value at optimum speed  
d) first decreases and then increases after reaching a maximum value at optimum speed
- 14) In signal design as per Indian Roads Congress specifications, if the sum of the ratios of normal flows to saturation flow of two directional traffic flows is 0.50 and the total lost time per cycle is 10 seconds, the optimum cycle length in seconds is \_\_\_\_\_.  
a) 100  
b) 80  
c) 60  
d) 40



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Set **Q**

**Fourth. Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Civil ENGINEERING**

**Traffic Engineering and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Answer any two questions (each carry 7 marks)**

**14**

- a) What are the objects and scope of traffic engineering? Explain briefly.  
 b) From an in-out survey conducted for a parking area consisting of 40 bays, the initial count was found to be 25. **Table-1** gives the result of the survey. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the **Table-1** below. Find the accumulation, total parking load, average occupancy and efficiency of the parking lot.

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25	7	3	55	3	3
30	8	2	60	2	5

- c) Explain Spot speed, running speed, Space-mean speed, time mean speed and average speed.  
 d) Write a short note on any two.  
 1) Level of Service  
 2) Passenger Car Unit  
 3) Collision and Condition Diagram  
 4) O-D survey

**Q.3 Answer any TWO questions (each carry 7 marks)**

**14**

- a) Explain the relationship between speed, travel time, volume, density and capacity?  
 b) Discuss the various types of on street parking with their advantages and disadvantages.  
 c) Define the term capacity. Explain terms basic capacity, possible capacity and practical capacity.  
 d) A vehicle skids through a distance equal to 40m before colliding with another parked vehicle, the weight of which is 60% of the former. After collision both the vehicles skid through 12m before stopping. Compute the initial speed of moving vehicle, assuming average friction coefficient,  $f=0.6$ .

## Section – II

**Q.4 Answer any two questions (each carry 7 marks)****14**

- a) Explain general principles governing application of speed limits in Rural and Urban area.
- b) With neat sketches show some of the important types of warning signs and mention the functions of each.
- c) Write a short note on ITS applications in urban transport system.
- d) A fixed type 2 - phase signal is to be provided at an intersection having a North - South and an East - West Road, where only straight-ahead traffic is permitted. The design hour flows from the various arms and the saturation flows for these arms are given in the following table.

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	800	400	750	600
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**Q.5 Answer any TWO questions (each carry 7 marks)****14**

- a) What are the objects of highway lighting? Explain various design factors to be considered in road lighting.
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  - 1) Three arm priority junction
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  - 3) Flyover approach in rural section
  - 4) Curve delineation in divided highway
- c) Explain with neat sketch.
  - 1) Roadway Delineators
  - 2) Hazard Markers
  - 3) Safety Barriers

<b>Seat No.</b>	
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**Fourth. Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Civil ENGINEERING**

**Traffic Engineering and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Speed regulations on roads is decided on the basis of \_\_\_\_\_.  
 a) 60<sup>th</sup> percentile cumulative frequency  
 b) 85<sup>th</sup> percentile cumulative frequency  
 c) 55<sup>th</sup> percentile cumulative frequency  
 d) 98<sup>th</sup> percentile cumulative frequency
- 2) On a road the free speed was 65 kmph and the space headway at jam density was 6.25m. What is the maximum flow which could be expected on this road?  
 a) 2600 vph  
 b) 1625 vph  
 c) 1300 vph  
 d) 406 vph
- 3) If present ADT is 5000 vehicles and annual increase is 10%, the average future flow after 5 years will be \_\_\_\_\_.  
 a) 6050 vehicles  
 b) 7050 vehicles  
 c) 8050 vehicles  
 d) 9050 vehicles
- 4) A traffic stream in a particular direction of a two-lane road is moving with a constant speed of 50 kmph, with an average headway of 2.52 seconds. The longitudinal distance between two consecutive vehicles is \_\_\_\_\_.  
 a) 30m  
 b) 35m  
 c) 38m  
 d) 42m
- 5) Select the correct statement,  
 a) Traffic volume should always be more than traffic capacity  
 b) Traffic capacity should be always be more than traffic volume  
 c) Spot seed is the average speed of a vehicle at a specified section  
 d) 85<sup>th</sup> percentile speed is more than 98<sup>th</sup> percentile speed
- 6) The diagram which shows the approximate path of vehicles and pedestrians involved in accident is known as,  
 a) Spot maps  
 b) Pie charts  
 c) Condition diagram  
 d) Collision diagram
- 7) If the space headway is 7m, then the jam density in vehicle/km is \_\_\_\_\_.  
 a) 142  
 b) 144  
 c) 145  
 d) 146



Seat No.	
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Set **R**

**Fourth. Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Civil ENGINEERING**

**Traffic Engineering and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any two questions (each carry 7 marks)**

**14**

- a) What are the objects and scope of traffic engineering? Explain briefly.  
 b) From an in-out survey conducted for a parking area consisting of 40 bays, the initial count was found to be 25. **Table-1** gives the result of the survey. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the **Table-1** below. Find the accumulation, total parking load, average occupancy and efficiency of the parking lot.

**Table-1-In-Out Survey data**

In-out survey data			In-out survey data		
Time	In	Out	Time	In	Out
5	3	2	35	2	7
10	2	4	40	4	2
15	4	2	45	6	4
20	5	4	50	4	1
25	7	3	55	3	3
30	8	2	60	2	5

- c) Explain Spot speed, running speed, Space-mean speed, time mean speed and average speed.  
 d) Write a short note on any two.  
 1) Level of Service  
 2) Passenger Car Unit  
 3) Collision and Condition Diagram  
 4) O-D survey

**Q.3 Answer any TWO questions (each carry 7 marks)**

**14**

- a) Explain the relationship between speed, travel time, volume, density and capacity?  
 b) Discuss the various types of on street parking with their advantages and disadvantages.  
 c) Define the term capacity. Explain terms basic capacity, possible capacity and practical capacity.  
 d) A vehicle skids through a distance equal to 40m before colliding with another parked vehicle, the weight of which is 60% of the former. After collision both the vehicles skid through 12m before stopping. Compute the initial speed of moving vehicle, assuming average friction coefficient,  $f=0.6$ .

## Section – II

**Q.4 Answer any two questions (each carry 7 marks)****14**

- a) Explain general principles governing application of speed limits in Rural and Urban area.
- b) With neat sketches show some of the important types of warning signs and mention the functions of each.
- c) Write a short note on ITS applications in urban transport system.
- d) A fixed type 2 - phase signal is to be provided at an intersection having a North - South and an East - West Road, where only straight-ahead traffic is permitted. The design hour flows from the various arms and the saturation flows for these arms are given in the following table.

Design hour	North	South	East	West
flow(q) in PCU s/hour	800	400	750	600
Saturation flow (s) in PCU s /hour	2400	2000	3000	3000

Calculate the optimum cycle time and green times for the minimum overall delay. Use Webster's method. Assume time lost per phase due to starting delays as 2 seconds and value of amber period is 2 seconds. Sketch the timing diagram for each phase.

**Q.5 Answer any TWO questions (each carry 7 marks)****14**

- a) What are the objects of highway lighting? Explain various design factors to be considered in road lighting.
- b) Marks the different signs for below locations as per IRC-67-2001.
  - 1) Three arm priority junction
  - 2) Four arm priority junction
  - 3) Flyover approach in rural section
  - 4) Curve delineation in divided highway
- c) Explain with neat sketch.
  - 1) Roadway Delineators
  - 2) Hazard Markers
  - 3) Safety Barriers

Seat No.	
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Set	S
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**Fourth. Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Civil ENGINEERING**

**Traffic Engineering and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) With increase in speed of the traffic stream, the maximum capacity of the lane \_\_\_\_\_.  
 a) Increase  
 b) Decreases  
 c) first increases and then decreases after reaching a maximum value at optimum speed  
 d) first decreases and then increases after reaching a maximum value at optimum speed
- 2) In signal design as per Indian Roads Congress specifications, if the sum of the ratios of normal flows to saturation flow of two directional traffic flows is 0.50 and the total lost time per cycle is 10 seconds, the optimum cycle length in seconds is \_\_\_\_\_.  
 a) 100  
 b) 80  
 c) 60  
 d) 40
- 3) Two broken yellow line marking at center of road indicates \_\_\_\_\_.  
 a) No passing allowed on both side  
 b) Passing allowed on one side  
 c) Passing allowed on both side  
 d) Passing allowed only for left side vehicle
- 4) Maximum number of vehicles can be parked with \_\_\_\_\_.  
 a) Parallel parking  
 b) 30° angle parking  
 c) 45° angle parking  
 d) 90° angle parking
- 5) When volume of the road reaches maximum flow or the capacity, the volume capacity ratio approaches to a value of \_\_\_\_\_.  
 a) 1.0  
 b) 1.5  
 c) 0.0  
 d) 0.5
- 6) Speed regulations on roads is decided on the basis of \_\_\_\_\_.  
 a) 60<sup>th</sup> percentile cumulative frequency  
 b) 85<sup>th</sup> percentile cumulative frequency  
 c) 55<sup>th</sup> percentile cumulative frequency  
 d) 98<sup>th</sup> percentile cumulative frequency

- 7) On a road the free speed was 65 kmph and the space headway at jam density was 6.25m. What is the maximum flow which could be expected on this road?  
a) 2600 vph  
b) 1625 vph  
c) 1300 vph  
d) 406 vph
- 8) If present ADT is 5000 vehicles and annual increase is 10%, the average future flow after 5 years will be \_\_\_\_\_.  
a) 6050 vehicles  
b) 7050 vehicles  
c) 8050 vehicles  
d) 9050 vehicles
- 9) A traffic stream in a particular direction of a two-lane road is moving with a constant speed of 50 kmph, with an average headway of 2.52 seconds. The longitudinal distance between two consecutive vehicles is \_\_\_\_\_.  
a) 30m  
b) 35m  
c) 38m  
d) 42m
- 10) Select the correct statement,  
a) Traffic volume should always be more than traffic capacity  
b) Traffic capacity should be always be more than traffic volume  
c) Spot seed is the average speed of a vehicle at a specified section  
d) 85<sup>th</sup> percentile speed is more than 98<sup>th</sup> percentile speed
- 11) The diagram which shows the approximate path of vehicles and pedestrians involved in accident is known as,  
a) Spot maps  
b) Pie charts  
c) Condition diagram  
d) Collision diagram
- 12) If the space headway is 7m, then the jam density in vehicle/km is \_\_\_\_\_.  
a) 142  
b) 144  
c) 145  
d) 146
- 13) If the jam density is 145vehicles/km, and velocity is 60kph then the capacity flow is \_\_\_\_\_.  
a) 2175  
b) 2200  
c) 2375  
d) 2500
- 14) Level of Service A and F represents \_\_\_\_\_.  
a) Forced Flow and Free Flow respectively  
b) Free Flow and Forced Flow respectively  
c) Both are free flow  
d) Both are Forced flow



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**Fourth. Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Civil ENGINEERING**

**Traffic Engineering and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any two questions (each carry 7 marks)**

**14**

- What are the objects and scope of traffic engineering? Explain briefly.
- From an in-out survey conducted for a parking area consisting of 40 bays, the initial count was found to be 25. **Table-1** gives the result of the survey. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the **Table-1** below. Find the accumulation, total parking load, average occupancy and efficiency of the parking lot.

**Table-1-In-Out Survey data**

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15	4	2	45	6	4
20	5	4	50	4	1
25	7	3	55	3	3
30	8	2	60	2	5

- Explain Spot speed, running speed, Space-mean speed, time mean speed and average speed.
- Write a short note on any two.
  - Level of Service
  - Passenger Car Unit
  - Collision and Condition Diagram
  - O-D survey

**Q.3 Answer any TWO questions (each carry 7 marks)**

**14**

- Explain the relationship between speed, travel time, volume, density and capacity?
- Discuss the various types of on street parking with their advantages and disadvantages.
- Define the term capacity. Explain terms basic capacity, possible capacity and practical capacity.
- A vehicle skids through a distance equal to 40m before colliding with another parked vehicle, the weight of which is 60% of the former. After collision both the vehicles skid through 12m before stopping. Compute the initial speed of moving vehicle, assuming average friction coefficient,  $f=0.6$ .

## Section – II

**Q.4 Answer any two questions (each carry 7 marks)****14**

- a) Explain general principles governing application of speed limits in Rural and Urban area.
- b) With neat sketches show some of the important types of warning signs and mention the functions of each.
- c) Write a short note on ITS applications in urban transport system.
- d) A fixed type 2 - phase signal is to be provided at an intersection having a North - South and an East - West Road, where only straight-ahead traffic is permitted. The design hour flows from the various arms and the saturation flows for these arms are given in the following table.

Design hour flow(q) in PCU s/hour	North	South	East	West
	800	400	750	600
Saturation flow (s) in PCU s /hour	2400	2000	3000	3000

Calculate the optimum cycle time and green times for the minimum overall delay. Use Webster's method. Assume time lost per phase due to starting delays as 2 seconds and value of amber period is 2 seconds. Sketch the timing diagram for each phase.

**Q.5 Answer any TWO questions (each carry 7 marks)****14**

- a) What are the objects of highway lighting? Explain various design factors to be considered in road lighting.
- b) Marks the different signs for below locations as per IRC-67-2001.
  - 1) Three arm priority junction
  - 2) Four arm priority junction
  - 3) Flyover approach in rural section
  - 4) Curve delineation in divided highway
- c) Explain with neat sketch.
  - 1) Roadway Delineators
  - 2) Hazard Markers
  - 3) Safety Barriers

<b>Seat No.</b>	
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<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Railway Track**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Question No. 2 is compulsory and attempt any two from the remaining.  
 2) Question No. 8 is compulsory and attempt any two from the remaining.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain the following:  | <b>06</b> |
|            | 1) On- Track Maintenance  |           |
|            | 2) Mobile Maintenance Unit  |           |
|            | 3) Sectional Gangs  |           |
|            | <b>b)</b> With the help of diagram, illustrate the tamping procedure  | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Explain Preliminary Works for Track Renewal.  | <b>04</b> |
|            | <b>b)</b> Explain the renewal of Sleepers.  | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Elaborate the inspection of Level crossing.   | <b>04</b> |
|            | <b>b)</b> Explain signs of Destressing in Group-I and Group-II Bridges.   | <b>05</b> |
| <b>Q.5</b> | <b>a)</b> Describe the chemical and mechanical composition of all types of steel used in Indian Railway tracks. | <b>05</b> |
|            | <b>b)</b> Explain the handling process of rails.  | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Illustrate the reasons behind defects found in Rails.  | <b>04</b> |
|            | <b>b)</b> Elaborate with the help of a diagram details of LWR.   | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> With the help of diagram explain Alumina Thermite process.   | <b>04</b> |
|            | <b>b)</b> Identify the various types of derailments and mention the aspects of derailments.  | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> Explain diamond crossing with help of diagram.   | <b>05</b> |
|            | <b>b)</b> A main line track on BG is having LWR of 52 kgs Laid at 40°C. The maximum rail temperature is 60°C and the minimum rail temperature is 0°C. Calculate the following: | <b>05</b> |
|            | 1) Tension in rail   |           |
|            | 2) compression in rail   |           |
|            | 3) tensile stress and  |           |
|            | 4) compressive stress  |           |
| <b>Q.9</b> | <b>a)</b> Illustrate the requirement of Railway station, (at least six points).  | <b>04</b> |
|            | <b>b)</b> Discuss Nadal's Formula and its application.   | <b>05</b> |

<b>Seat No.</b>	
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- 9) Indication post for detonators should be provide data at a distance of \_\_\_\_\_ m & \_\_\_\_\_m for B.G.
- a) 400 m & 800 m                      b) 500 m & 1200 m  
c) 600 m & 1200 m                      d) 600 m & 1000 m
- 10) For protection of level crossing gate in an emergency on BG, Double line, the gateman should place one detonator at one place & three detonator at subsequent place at a distance of \_\_\_\_\_ m & \_\_\_\_\_ m respectively.
- a) 400 m & 800 m                      b) 600 m & 1200 m  
c) 500 m & 1000 m                      d) 300 m & 900 m
- 11) In an unmanned Level crossing, stop board should be provided at a distance of from the centre of nearest track \_\_\_\_\_.
- a) 5 m                                      b) 10 m  
c) 7.5 m                                      d) None of these
- 12) Replacement of swing gates by lifting barrier existing manned Level Crossings shall be carried out where TVU is more than \_\_\_\_\_.
- a) 4000                                      b) 50,000  
c) 40,000                                      d) 60,000
- 13) TSR is recommended when the %age of unserviceable sleeper become more than \_\_\_\_\_.
- a) 20%                                      b) 40%  
c) 30%                                      d) None of these
- 14) Through renewal of rubber pads shall be planned after \_\_\_\_\_ years.
- a) 7    b) 6  
c) 5    d) 4

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Railway Track**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Question No. 2 is compulsory and attempt any two from the remaining.  
 2) Question No. 8 is compulsory and attempt any two from the remaining.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain the following:  | <b>06</b> |
|            | 1) On- Track Maintenance  |           |
|            | 2) Mobile Maintenance Unit  |           |
|            | 3) Sectional Gangs  |           |
|            | <b>b)</b> With the help of diagram, illustrate the tamping procedure  | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Explain Preliminary Works for Track Renewal.  | <b>04</b> |
|            | <b>b)</b> Explain the renewal of Sleepers.  | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Elaborate the inspection of Level crossing.   | <b>04</b> |
|            | <b>b)</b> Explain signs of Destressing in Group-I and Group-II Bridges.   | <b>05</b> |
| <b>Q.5</b> | <b>a)</b> Describe the chemical and mechanical composition of all types of steel used in Indian Railway tracks. | <b>05</b> |
|            | <b>b)</b> Explain the handling process of rails.  | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Illustrate the reasons behind defects found in Rails.  | <b>04</b> |
|            | <b>b)</b> Elaborate with the help of a diagram details of LWR.   | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> With the help of diagram explain Alumina Thermite process.   | <b>04</b> |
|            | <b>b)</b> Identify the various types of derailments and mention the aspects of derailments.  | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> Explain diamond crossing with help of diagram.   | <b>05</b> |
|            | <b>b)</b> A main line track on BG is having LWR of 52 kgs Laid at 40°C. The maximum rail temperature is 60°C and the minimum rail temperature is 0°C. Calculate the following: | <b>05</b> |
|            | 1) Tension in rail   |           |
|            | 2) compression in rail   |           |
|            | 3) tensile stress and  |           |
|            | 4) compressive stress  |           |
| <b>Q.9</b> | <b>a)</b> Illustrate the requirement of Railway station, (at least six points).  | <b>04</b> |
|            | <b>b)</b> Discuss Nadal's Formula and its application.   | <b>05</b> |



<b>Seat No.</b>	
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Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.

## Marks: 14

14

- Page 7 of 13

- 8) In an unmanned Level crossing, stop board should be provided at a distance of from the centre of nearest track \_\_\_\_\_.  
a) 5 m  
b) 10 m  
c) 7.5 m  
d) None of these
- 9) Replacement of swing gates by lifting barrier existing manned Level Crossings shall be carried out where TVU is more than \_\_\_\_\_.  
a) 4000  
b) 50,000  
c) 40,000  
d) 60,000
- 10) TSR is recommended when the %age of unserviceable sleeper become more than \_\_\_\_\_.  
a) 20%  
b) 40%  
c) 30%  
d) None of these
- 11) Through renewal of rubber pads shall be planned after \_\_\_\_\_ years.  
a) 7  
b) 6  
c) 5  
d) 4
- 12) Minimum shoulder ballast in tangential track of LWR: \_\_\_\_\_.  
a) 300mm  
b) 350mm  
c) 600mm  
d) 500m
- 13) LWR/CWR can be laid on vertical curve where algebraic difference between two grades is: \_\_\_\_\_.  
a) 2mm/m  
b) 4mm/m  
c) 3mm/m  
d) 5mm/m
- 14) SEJ must not fall on curves having radius \_\_\_\_\_.  
a) > 3500m  
b) <3500m  
c) 440m  
d) >440m

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Railway Track**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Question No. 2 is compulsory and attempt any two from the remaining.  
 2) Question No. 8 is compulsory and attempt any two from the remaining.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain the following:  | <b>06</b> |
|            | 1) On- Track Maintenance  |           |
|            | 2) Mobile Maintenance Unit  |           |
|            | 3) Sectional Gangs  |           |
|            | <b>b)</b> With the help of diagram, illustrate the tamping procedure  | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Explain Preliminary Works for Track Renewal.  | <b>04</b> |
|            | <b>b)</b> Explain the renewal of Sleepers.  | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Elaborate the inspection of Level crossing.   | <b>04</b> |
|            | <b>b)</b> Explain signs of Destressing in Group-I and Group-II Bridges.   | <b>05</b> |
| <b>Q.5</b> | <b>a)</b> Describe the chemical and mechanical composition of all types of steel used in Indian Railway tracks. | <b>05</b> |
|            | <b>b)</b> Explain the handling process of rails.  | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Illustrate the reasons behind defects found in Rails.  | <b>04</b> |
|            | <b>b)</b> Elaborate with the help of a diagram details of LWR.   | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> With the help of diagram explain Alumina Thermite process.   | <b>04</b> |
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| <b>Q.8</b> | <b>a)</b> Explain diamond crossing with help of diagram.   | <b>05</b> |
|            | <b>b)</b> A main line track on BG is having LWR of 52 kgs Laid at 40°C. The maximum rail temperature is 60°C and the minimum rail temperature is 0°C. Calculate the following: | <b>05</b> |
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| <b>Q.9</b> | <b>a)</b> Illustrate the requirement of Railway station, (at least six points).  | <b>04</b> |
|            | <b>b)</b> Discuss Nadal's Formula and its application.   | <b>05</b> |

<b>Seat No.</b>	
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<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Railway Track**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Question No. 2 is compulsory and attempt any two from the remaining.  
 2) Question No. 8 is compulsory and attempt any two from the remaining.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain the following:  | <b>06</b> |
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**Section – II**

- |            |  |           |
|------------|--|-----------|
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|            | 4) compressive stress  |           |
| <b>Q.9</b> | <b>a)</b> Illustrate the requirement of Railway station, (at least six points).  | <b>04</b> |

**b)** Discuss Nadal's Formula and its application.

**05**

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Construction Productivity**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Productivity measurement is complicated by
  - a) the competition's output
  - b) the fact that precise units of measure are often unavailable
  - c) stable quality
  - d) the workforce size
- 2) Production improvement spending will be mostly on
 

a) Direct Labour	b) Indirect labour
c) Material	d) Overhead
- 3) The single-factor productivity measures
 

a) Output per labor hour	b) Output per machine
c) Output per ton of material	d) Any one of these
- 4) Total work content =
  - a) Basic work content + Excess time
  - b) Basic work content - Excess time
  - c) Basic work content + Ineffective time
  - d) Basic work content – Ineffective time
- 5) Which of the following adds idle time due to short runs?
 

a) Excessive product variety	b) Lack of Standardization
c) Both (A) and (B)	d) Design changes
- 6) Preventive maintenance improves
 

a) Material productivity	b) Labour productivity
c) Machine productivity	d) Capital productivity
- 7) Productivity =
 

a) Input / Output	b) Output / Input
c) Output – Input	d) Input – Output
- 8) The elimination of which of the following will improve industrial productivity
 

a) Excess time	b) Ineffective time
c) Both (A) and (B)	d) None of the above



- 9) The time for which the worker or machine or both remain idle due to the shortcomings of the management or workers is known as
- a) Excess time
  - b) Idle time
  - c) Ineffective time
  - d) Work content
- 10) Productivity can be increased by
- a) By increasing the output from the same input
  - b) By reducing the input for the same output
  - c) Both (A) and (B)
  - d) None of the above
- 11) Raw material productivity can be increased by
- a) Proper choice of design
  - b) Reuse of material
  - c) Scrap control
  - d) All of the above
- 12) Productivity can be measured in which of the following input resource(s)
- a) Material input
  - b) Capital and Land Input
  - c) All of the above
  - d) None of these
- 13) The resources utilized for production are
- a) Materials, Machines, Manpower
  - b) Materials, Methods, Machines
  - c) Machines, Manpower, Methods
  - d) Methods, Machine, Manpower
- 14) Productivity is the \_\_\_\_ of production system.
- a) Measurement
  - b) Efficiency
  - c) Both (A) and (B)
  - d) None of the above

Seat No.	
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Set **P**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Construction Productivity**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) In Section – I, all questions are compulsory.  
 2) In Section – II, Question No. 5 is compulsory and Solve any two of remaining questions.  
 3) Figures to right indicate full marks.

**Section – I**

- Q.2 Solve the following.** **12**
- a) 1200 Sqm of construction of Solid block masonry without finishing is proposed to be done by 4 crews each of 1 mason and 1 helper. The standard productivity is 20 Sqm/day/crew. Working time is 8Hr/day. How much duration will be required for completing the work?
  - b) Compare the following two categories of productivity loss
    - 1) losses that result from a reduction in an organization's ability to execute on its primary value proposition
    - 2) losses that result from personnel being paid but unable to perform their duties
- Q.3 Answer the following.** **08**
- a) What are the factors influencing employee performance?
  - b) How to measure productivity?
- Q.4 Write Notes On** **08**
- a) Labour Productivity improvement with new Technologies
  - b) Advantages due to increased labour productivity

**Section – II**

- Q.5 Explain the following.** **12**
- a) Factors influencing Productivity
  - b) Sources of Lost time
  - c) Tools to identify Productivity loss
- Q.6 Write Notes on** **08**
- a) Influence of Human Factors on productivity
  - b) Methods of Motivating for improved productivity
- Q.7 Explain the following** **08**
- a) Work sampling
  - b) Compare Tour approach with Crew Approach
- Q.8 Write Notes on** **08**
- a) Crew Balance Chart
  - b) Flow Diagrams

Seat No.	
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Set Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Construction Productivity**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The elimination of which of the following will improve industrial productivity
  - a) Excess time
  - b) Ineffective time
  - c) Both (A) and (B)
  - d) None of the above
- 2) The time for which the worker or machine or both remain idle due to the shortcomings of the management or workers is known as
  - a) Excess time
  - b) Idle time
  - c) Ineffective time
  - d) Work content
- 3) Productivity can be increased by
  - a) By increasing the output from the same input
  - b) By reducing the input for the same output
  - c) Both (A) and (B)
  - d) None of the above
- 4) Raw material productivity can be increased by
  - a) Proper choice of design
  - b) Reuse of material
  - c) Scrap control
  - d) All of the above
- 5) Productivity can be measured in which of the following input resource(s)
  - a) Material input
  - b) Capital and Land Input
  - c) All of the above
  - d) None of these
- 6) The resources utilized for production are
  - a) Materials, Machines, Manpower
  - b) Materials, Methods, Machines
  - c) Machines, Manpower, Methods
  - d) Methods, Machine, Manpower
- 7) Productivity is the \_\_\_\_\_ of production system.
  - a) Measurement
  - b) Efficiency
  - c) Both (A) and (B)
  - d) None of the above

- 8) Productivity measurement is complicated by
- a) the competition's output
  - b) the fact that precise units of measure are often unavailable
  - c) stable quality
  - d) the workforce size
- 9) Production improvement spending will be mostly on
- a) Direct Labour
  - b) Indirect labour
  - c) Material
  - d) Overhead
- 10) The single-factor productivity measures
- a) Output per labor hour
  - b) Output per machine
  - c) Output per ton of material
  - d) Any one of these
- 11) Total work content =
- a) Basic work content + Excess time
  - b) Basic work content - Excess time
  - c) Basic work content + Ineffective time
  - d) Basic work content – Ineffective time
- 12) Which of the following adds idle time due to short runs?
- a) Excessive product variety
  - b) Lack of Standardization
  - c) Both (A) and (B)
  - d) Design changes
- 13) Preventive maintenance improves
- a) Material productivity
  - b) Labour productivity
  - c) Machine productivity
  - d) Capital productivity
- 14) Productivity =
- a) Input / Output
  - b) Output / Input
  - c) Output – Input
  - d) Input – Output

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Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Construction Productivity**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) In Section – I, all questions are compulsory.  
 2) In Section – II, Question No. 5 is compulsory and Solve any two of remaining questions.  
 3) Figures to right indicate full marks.

**Section – I**

- Q.2 Solve the following.** **12**
- a) 1200 Sqm of construction of Solid block masonry without finishing is proposed to be done by 4 crews each of 1 mason and 1 helper. The standard productivity is 20 Sqm/day/crew. Working time is 8Hr/day. How much duration will be required for completing the work?
  - b) Compare the following two categories of productivity loss
    - 1) losses that result from a reduction in an organization's ability to execute on its primary value proposition
    - 2) losses that result from personnel being paid but unable to perform their duties
- Q.3 Answer the following.** **08**
- a) What are the factors influencing employee performance?
  - b) How to measure productivity?
- Q.4 Write Notes On** **08**
- a) Labour Productivity improvement with new Technologies
  - b) Advantages due to increased labour productivity

**Section – II**

- Q.5 Explain the following.** **12**
- a) Factors influencing Productivity
  - b) Sources of Lost time
  - c) Tools to identify Productivity loss
- Q.6 Write Notes on** **08**
- a) Influence of Human Factors on productivity
  - b) Methods of Motivating for improved productivity
- Q.7 Explain the following** **08**
- a) Work sampling
  - b) Compare Tour approach with Crew Approach
- Q.8 Write Notes on** **08**
- a) Crew Balance Chart
  - b) Flow Diagrams

Seat No.	
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Set **R**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Construction Productivity**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Raw material productivity can be increased by
  - a) Proper choice of design
  - b) Reuse of material
  - c) Scrap control
  - d) All of the above
- 2) Productivity can be measured in which of the following input resource(s)
  - a) Material input
  - b) Capital and Land Input
  - c) All of the above
  - d) None of these
- 3) The resources utilized for production are
  - a) Materials, Machines, Manpower
  - b) Materials, Methods, Machines
  - c) Machines, Manpower, Methods
  - d) Methods, Machine, Manpower
- 4) Productivity is the \_\_\_\_ of production system.
  - a) Measurement
  - b) Efficiency
  - c) Both (A) and (B)
  - d) None of the above
- 5) Productivity measurement is complicated by
  - a) the competition's output
  - b) the fact that precise units of measure are often unavailable
  - c) stable quality
  - d) the workforce size
- 6) Production improvement spending will be mostly on
  - a) Direct Labour
  - b) Indirect labour
  - c) Material
  - d) Overhead
- 7) The single-factor productivity measures
  - a) Output per labor hour
  - b) Output per machine
  - c) Output per ton of material
  - d) Any one of these
- 8) Total work content =
  - a) Basic work content + Excess time
  - b) Basic work content - Excess time
  - c) Basic work content + Ineffective time
  - d) Basic work content – Ineffective time

- 9) Which of the following adds idle time due to short runs?
- a) Excessive product variety      b) Lack of Standardization
  - c) Both (A) and (B)                  d) Design changes
- 10) Preventive maintenance improves
- a) Material productivity                  b) Labour productivity
  - c) Machine productivity                 d) Capital productivity
- 11) Productivity =
- a) Input / Output                          b) Output / Input
  - c) Output – Input                         d) Input – Output
- 12) The elimination of which of the following will improve industrial productivity
- a) Excess time                              b) Ineffective time
  - c) Both (A) and (B)                      d) None of the above
- 13) The time for which the worker or machine or both remain idle due to the shortcomings of the management or workers is known as
- a) Excess time                              b) Idle time
  - c) Ineffective time                         d) Work content
- 14) Productivity can be increased by
- a) By increasing the output from the same input
  - b) By reducing the input for the same output
  - c) Both (A) and (B)
  - d) None of the above

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R
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Construction Productivity**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) In Section – I, all questions are compulsory.  
 2) In Section – II, Question No. 5 is compulsory and Solve any two of remaining questions.  
 3) Figures to right indicate full marks.

**Section – I**

- Q.2 Solve the following.** **12**
- 1200 Sqm of construction of Solid block masonry without finishing is proposed to be done by 4 crews each of 1 mason and 1 helper. The standard productivity is 20 Sqm/day/crew. Working time is 8Hr/day. How much duration will be required for completing the work?
  - Compare the following two categories of productivity loss
    - losses that result from a reduction in an organization's ability to execute on its primary value proposition
    - losses that result from personnel being paid but unable to perform their duties
- Q.3 Answer the following.** **08**
- What are the factors influencing employee performance?
  - How to measure productivity?
- Q.4 Write Notes On** **08**
- Labour Productivity improvement with new Technologies
  - Advantages due to increased labour productivity

**Section – II**

- Q.5 Explain the following.** **12**
- Factors influencing Productivity
  - Sources of Lost time
  - Tools to identify Productivity loss
- Q.6 Write Notes on** **08**
- Influence of Human Factors on productivity
  - Methods of Motivating for improved productivity
- Q.7 Explain the following** **08**
- Work sampling
  - Compare Tour approach with Crew Approach
- Q.8 Write Notes on** **08**
- Crew Balance Chart
  - Flow Diagrams



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Construction Productivity**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Preventive maintenance improves
  - a) Material productivity
  - b) Labour productivity
  - c) Machine productivity
  - d) Capital productivity
- 2) Productivity =
  - a) Input / Output
  - b) Output / Input
  - c) Output – Input
  - d) Input – Output
- 3) The elimination of which of the following will improve industrial productivity
  - a) Excess time
  - b) Ineffective time
  - c) Both (A) and (B)
  - d) None of the above
- 4) The time for which the worker or machine or both remain idle due to the shortcomings of the management or workers is known as
  - a) Excess time
  - b) Idle time
  - c) Ineffective time
  - d) Work content
- 5) Productivity can be increased by
  - a) By increasing the output from the same input
  - b) By reducing the input for the same output
  - c) Both (A) and (B)
  - d) None of the above
- 6) Raw material productivity can be increased by
  - a) Proper choice of design
  - b) Reuse of material
  - c) Scrap control
  - d) All of the above
- 7) Productivity can be measured in which of the following input resource(s)
  - a) Material input
  - b) Capital and Land Input
  - c) All of the above
  - d) None of these
- 8) The resources utilized for production are
  - a) Materials, Machines, Manpower
  - b) Materials, Methods, Machines
  - c) Machines, Manpower, Methods
  - d) Methods, Machine, Manpower

- 9) Productivity is the \_\_\_\_\_ of production system.

a) Measurement	b) Efficiency
c) Both (A) and (B)	d) None of the above
- 10) Productivity measurement is complicated by

a) the competition's output
b) the fact that precise units of measure are often unavailable
c) stable quality
d) the workforce size
- 11) Production improvement spending will be mostly on

a) Direct Labour	b) Indirect labour
c) Material	d) Overhead
- 12) The single-factor productivity measures

a) Output per labor hour	b) Output per machine
c) Output per ton of material	d) Any one of these
- 13) Total work content =

a) Basic work content + Excess time
b) Basic work content - Excess time
c) Basic work content + Ineffective time
d) Basic work content – Ineffective time
- 14) Which of the following adds idle time due to short runs?

a) Excessive product variety	b) Lack of Standardization
c) Both (A) and (B)	d) Design changes

Seat No.	
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Set **S**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Construction Productivity**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) In Section – I, all questions are compulsory.  
 2) In Section – II, Question No. 5 is compulsory and Solve any two of remaining questions.  
 3) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve the following.** **12**

- a) 1200 Sqm of construction of Solid block masonry without finishing is proposed to be done by 4 crews each of 1 mason and 1 helper. The standard productivity is 20 Sqm/day/crew. Working time is 8Hr/day. How much duration will be required for completing the work?
- b) Compare the following two categories of productivity loss
  - 1) losses that result from a reduction in an organization's ability to execute on its primary value proposition
  - 2) losses that result from personnel being paid but unable to perform their duties

**Q.3 Answer the following.** **08**

- a) What are the factors influencing employee performance?
- b) How to measure productivity?

**Q.4 Write Notes On** **08**

- a) Labour Productivity improvement with new Technologies
- b) Advantages due to increased labour productivity

**Section – II**

**Q.5 Explain the following.** **12**

- a) Factors influencing Productivity
- b) Sources of Lost time
- c) Tools to identify Productivity loss

**Q.6 Write Notes on** **08**

- a) Influence of Human Factors on productivity
- b) Methods of Motivating for improved productivity

**Q.7 Explain the following** **08**

- a) Work sampling
- b) Compare Tour approach with Crew Approach

**Q.8 Write Notes on** **08**

- a) Crew Balance Chart
- b) Flow Diagrams

Seat No.	
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Set	P
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Systems**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly .

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) System approach provides the \_\_\_\_\_ scheme that makes involvement accessible.
 

a) Life cycle planning	b) Life cycle integration
c) Decision making	d) Integrated Training
- 2) \_\_\_\_\_ is an art of obtaining the best results in design, construction and planning of any engineering system.
 

a) Optimization	b) Simulation methods
c) CPM or PERT	d) Optimal design
- 3) \_\_\_\_\_ is a mathematical technique suitable for optimization of multistage decision problems
 

a) Dynamic programming	b) Queuing theory
c) Design of Experiments	d) Game Theory
- 4) \_\_\_\_\_ is a method for numerical procedure solving differential equations associated with field problems.
 

a) Mathematic Programming	
b) Finite elements	
c) Stochastic process	
d) Statistical methods	
- 5) \_\_\_\_\_ is an organizational level or layer of nature which consist lowest level of all biotic and abiotic elements.
 

a) Environment	b) Ecology
c) Ecosystem	d) Biology
- 6) \_\_\_\_\_ includes testing and experimentation models as a iterative process.
 

a) System approach	b) System Programming
c) Statistical analysis	d) System analysis
- 7) The \_\_\_\_\_ is used to convey changes in the numbers, age class distribution, sex ratio and behavior of population through time and space.
 

a) Population density	b) Population dynamics
c) Population dispersion	d) Population Chemistry

- 8) The \_\_\_\_\_ model provides easy access to data for the formation and implementation to effective solid waste management.
- a) Integrated waste model
  - b) Municipal waste management
  - c) Sustainable waste management
  - d) Environmental waste management
- 9) Internal flow like recirculation released with pumps fulfill the requirements in \_\_\_\_\_ models.
- a) Flow variable
  - b) Statistical Flow
  - c) Laminar flow
  - d) Gravitational How
- 10) For a model modification the transformation factor between total suspended solids and COD is \_\_\_\_\_.
- a) 0.5
  - b) 0.75
  - c) 1.5
  - d) 2.5
- 11) \_\_\_\_\_ are the interfaces between inflow and outflow.
- a) Venturimetr
  - b) Orifice
  - c) Connectors
  - d) Junction box
- 12) The \_\_\_\_\_ examines the extreme points in a systematic manner, repeating the algorithm until optimal solution is reached.
- a) Graphical method
  - b) Optimal method
  - c) Statistical method
  - d) Simplex method
- 13) \_\_\_\_\_ is a combined meteorology and diffusion model.
- a) Meteorological model
  - b) Gaussian plume model
  - c) Dispersion Model
  - d) Atmospheric dispersion model
- 14) \_\_\_\_\_ estimates temporal and spatial emission based on per unit of activity and meteorology.
- a) Emission model
  - b) Receptor model
  - c) Source dispersion model
  - d) Plume Behavior

Seat No.	
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P

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Systems**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it dearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain with neat sketch the scope of system approach.          | <b>05</b> |
|            | <b>b)</b> Explain the characteristics of Integrated Waste Management.     | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain three basic models which are used in system approach.   | <b>05</b> |
|            | <b>b)</b> Explain what is building modeling.                              | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain ecological modeling of an ecosystem.                    | <b>04</b> |
|            | <b>b)</b> Explain the research methodology of Effective Waste Management. | <b>05</b> |
| <b>Q.5</b> | <b>Write Short Notes</b>  |           |
|            | <b>a)</b> Characteristics of Population Ecology                           | <b>05</b> |
|            | <b>b)</b> Reuse and Recovery of Paper                                     | <b>04</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.6</b> | <b>a)</b> What is Linear Programming and discuss the application of LP in civil Engineering | <b>05</b> |
|            | <b>b)</b> Explain the basic concept of Wastewater model.                                    | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Explain the pollutant standard index criteria.                                    | <b>04</b> |
|            | <b>b)</b> Explain the point source Gaussian plume model.                                    | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> Explain the wastewater treatment process (Aerobic Process).                       | <b>05</b> |
|            | <b>b)</b> Explain the salient features of Optimization.                                     | <b>04</b> |
| <b>Q.9</b> | <b>Write Short Notes</b>  |           |
|            | <b>a)</b> Motor Vehicle Emission  | <b>05</b> |
|            | <b>b)</b> Inflow Model  | <b>04</b> |

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Systems**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly .

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The \_\_\_\_\_ model provides easy access to data for the formation and implementation to effective solid waste management.
  - a) Integrated waste model
  - b) Municipal waste management
  - c) Sustainable waste management
  - d) Environmental waste management
- 2) Internal flow like recirculation released with pumps fulfill the requirements in \_\_\_\_\_ models.
  - a) Flow variable
  - b) Statistical Flow
  - c) Laminar flow
  - d) Gravitational How
- 3) For a model modification the transformation factor between total suspended solids and COD is \_\_\_\_\_.
  - a) 0.5
  - b) 0.75
  - c) 1.5
  - d) 2.5
- 4) \_\_\_\_\_ are the interfaces between inflow and outflow.
  - a) Venturimeter
  - b) Orifice
  - c) Connectors
  - d) Junction box
- 5) The \_\_\_\_\_ examines the extreme points in a systematic manner, repeating the algorithm until optimal solution is reached.
  - a) Graphical method
  - b) Optimal method
  - c) Statistical method
  - d) Simplex method
- 6) \_\_\_\_\_ is a combined meteorology and diffusion model.
  - a) Meteorological model
  - b) Gaussian plume model
  - c) Dispersion Model
  - d) Atmospheric dispersion model
- 7) \_\_\_\_\_ estimates temporal and spatial emission based on per unit of activity and meteorology.
  - a) Emission model
  - b) Receptor model
  - c) Source dispersion model
  - d) Plume Behavior

- 8) System approach provides the \_\_\_\_\_ scheme that makes involvement accessible.
- a) Life cycle planning
  - b) Life cycle integration
  - c) Decision making
  - d) Integrated Training
- 9) \_\_\_\_\_ is an art of obtaining the best results in design, construction and planning of any engineering system.
- a) Optimization
  - b) Simulation methods
  - c) CPM or PERT
  - d) Optimal design
- 10) \_\_\_\_\_ is a mathematical technique suitable for optimization of multistage decision problems
- a) Dynamic programming
  - b) Queuing theory
  - c) Design of Experiments
  - d) Game Theory
- 11) \_\_\_\_\_ is a method for numerical procedure solving differential equations associated with field problems.
- a) Mathematic Programming
  - b) Finite elements
  - c) Stochastic process
  - d) Statistical methods
- 12) \_\_\_\_\_ is an organizational level or layer of nature which consist lowest level of all biotic and abiotic elements.
- a) Environment
  - b) Ecology
  - c) Ecosystem
  - d) Biology
- 13) \_\_\_\_\_ includes testing and experimentation models as a iterative process.
- a) System approach
  - b) System Programming
  - c) Statistical analysis
  - d) System analysis
- 14) The \_\_\_\_\_ is used to convey changes in the numbers, age class distribution, sex ratio and behavior of population through time and space.
- a) Population density
  - b) Population dynamics
  - c) Population dispersion
  - d) Population Chemistry



Seat No.	
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Set	Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Systems**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it dearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain with neat sketch the scope of system approach.          | <b>05</b> |
|            | <b>b)</b> Explain the characteristics of Integrated Waste Management.     | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain three basic models which are used in system approach.   | <b>05</b> |
|            | <b>b)</b> Explain what is building modeling.                              | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain ecological modeling of an ecosystem.                    | <b>04</b> |
|            | <b>b)</b> Explain the research methodology of Effective Waste Management. | <b>05</b> |
| <b>Q.5</b> | <b>Write Short Notes</b>  |           |
|            | <b>a)</b> Characteristics of Population Ecology                           | <b>05</b> |
|            | <b>b)</b> Reuse and Recovery of Paper                                     | <b>04</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.6</b> | <b>a)</b> What is Linear Programming and discuss the application of LP in civil Engineering | <b>05</b> |
|            | <b>b)</b> Explain the basic concept of Wastewater model.                                    | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Explain the pollutant standard index criteria.                                    | <b>04</b> |
|            | <b>b)</b> Explain the point source Gaussian plume model.                                    | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> Explain the wastewater treatment process (Aerobic Process).                       | <b>05</b> |
|            | <b>b)</b> Explain the salient features of Optimization.                                     | <b>04</b> |
| <b>Q.9</b> | <b>Write Short Notes</b>  |           |
|            | <b>a)</b> Motor Vehicle Emission  | <b>05</b> |
|            | <b>b)</b> Inflow Model  | <b>04</b> |

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Systems**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly .

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ are the interfaces between inflow and outflow.
 

a) Venturimeter	b) Orifice
c) Connectors	d) Junction box
- 2) The \_\_\_\_\_ examines the extreme points in a systematic manner, repeating the algorithm until optimal solution is reached.
 

a) Graphical method	b) Optimal method
c) Statistical method	d) Simplex method
- 3) \_\_\_\_\_ is a combined meteorology and diffusion model.
 

a) Meteorological model	b) Gaussian plume model
c) Dispersion Model	d) Atmospheric dispersion model
- 4) \_\_\_\_\_ estimates temporal and spatial emission based on per unit of activity and meteorology.
 

a) Emission model	b) Receptor model
c) Source dispersion model	d) Plume Behavior
- 5) System approach provides the \_\_\_\_\_ scheme that makes involvement accessible.
 

a) Life cycle planning	b) Life cycle integration
c) Decision making	d) Integrated Training
- 6) \_\_\_\_\_ is an art of obtaining the best results in design, construction and planning of any engineering system.
 

a) Optimization	b) Simulation methods
c) CPM or PERT	d) Optimal design
- 7) \_\_\_\_\_ is a mathematical technique suitable for optimization of multistage decision problems
 

a) Dynamic programming	b) Queuing theory
c) Design of Experiments	d) Game Theory

- 8) \_\_\_\_\_ is a method for numerical procedure solving differential equations associated with field problems.
- a) Mathematic Programming
  - b) Finite elements
  - c) Stochastic process
  - d) Statistical methods
- 9) \_\_\_\_\_ is an organizational level or layer of nature which consist lowest level of all biotic and abiotic elements.
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  - b) System Programming
  - c) Statistical analysis
  - d) System analysis
- 11) The \_\_\_\_\_ is used to convey changes in the numbers, age class distribution, sex ratio and behavior of population through time and space.
- a) Population density
  - b) Population dynamics
  - c) Population dispersion
  - d) Population Chemistry
- 12) The \_\_\_\_\_ model provides easy access to data for the formation and implementation to effective solid waste management.
- a) Integrated waste model
  - b) Municipal waste management
  - c) Sustainable waste management
  - d) Environmental waste management
- 13) Internal flow like recirculation released with pumps fulfill the requirements in \_\_\_\_\_ models.
- a) Flow variable
  - b) Statistical Flow
  - c) Laminar flow
  - d) Gravitational How
- 14) For a model modification the transformation factor between total suspended solids and COD is \_\_\_\_\_.
- a) 0.5
  - b) 0.75
  - c) 1.5
  - d) 2.5

Seat No.	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Systems**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
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 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain with neat sketch the scope of system approach.          | <b>05</b> |
|            | <b>b)</b> Explain the characteristics of Integrated Waste Management.     | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain three basic models which are used in system approach.   | <b>05</b> |
|            | <b>b)</b> Explain what is building modeling.                              | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain ecological modeling of an ecosystem.                    | <b>04</b> |
|            | <b>b)</b> Explain the research methodology of Effective Waste Management. | <b>05</b> |
| <b>Q.5</b> | <b>Write Short Notes</b>  |           |
|            | <b>a)</b> Characteristics of Population Ecology                           | <b>05</b> |
|            | <b>b)</b> Reuse and Recovery of Paper                                     | <b>04</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.6</b> | <b>a)</b> What is Linear Programming and discuss the application of LP in civil Engineering | <b>05</b> |
|            | <b>b)</b> Explain the basic concept of Wastewater model.                                    | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Explain the pollutant standard index criteria.                                    | <b>04</b> |
|            | <b>b)</b> Explain the point source Gaussian plume model.                                    | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> Explain the wastewater treatment process (Aerobic Process).                       | <b>05</b> |
|            | <b>b)</b> Explain the salient features of Optimization.                                     | <b>04</b> |
| <b>Q.9</b> | <b>Write Short Notes</b>  |           |
|            | <b>a)</b> Motor Vehicle Emission  | <b>05</b> |
|            | <b>b)</b> Inflow Model  | <b>04</b> |

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Systems**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ includes testing and experimentation models as a iterative process.
 

a) System approach	b) System Programming
c) Statistical analysis	d) System analysis
- 2) The \_\_\_\_\_ is used to convey changes in the numbers, age class distribution, sex ratio and behavior of population through time and space.
 

a) Population density	b) Population dynamics
c) Population dispersion	d) Population Chemistry
- 3) The \_\_\_\_\_ model provides easy access to data for the formation and implementation to effective solid waste management.
 

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c) 1.5	d) 2.5
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  - b) Simulation methods
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  - d) Game Theory
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  - b) Finite elements
  - c) Stochastic process
  - d) Statistical methods
- 14) \_\_\_\_\_ is an organizational level or layer of nature which consist lowest level of all biotic and abiotic elements.
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  - b) Ecology
  - c) Ecosystem
  - d) Biology

Seat No.	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Systems**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it dearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain with neat sketch the scope of system approach.          | <b>05</b> |
|            | <b>b)</b> Explain the characteristics of Integrated Waste Management.     | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain three basic models which are used in system approach.   | <b>05</b> |
|            | <b>b)</b> Explain what is building modeling.                              | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain ecological modeling of an ecosystem.                    | <b>04</b> |
|            | <b>b)</b> Explain the research methodology of Effective Waste Management. | <b>05</b> |
| <b>Q.5</b> | <b>Write Short Notes</b>  |           |
|            | <b>a)</b> Characteristics of Population Ecology                           | <b>05</b> |
|            | <b>b)</b> Reuse and Recovery of Paper                                     | <b>04</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.6</b> | <b>a)</b> What is Linear Programming and discuss the application of LP in civil Engineering | <b>05</b> |
|            | <b>b)</b> Explain the basic concept of Wastewater model.                                    | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Explain the pollutant standard index criteria.                                    | <b>04</b> |
|            | <b>b)</b> Explain the point source Gaussian plume model.                                    | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> Explain the wastewater treatment process (Aerobic Process).                       | <b>05</b> |
|            | <b>b)</b> Explain the salient features of Optimization.                                     | <b>04</b> |
| <b>Q.9</b> | <b>Write Short Notes</b>  |           |
|            | <b>a)</b> Motor Vehicle Emission  | <b>05</b> |
|            | <b>b)</b> Inflow Model  | <b>04</b> |

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Power Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) Annual depreciation of the plant is proportional to the earning capacity of the plant void \_\_\_\_\_.  
 a) sinking fund depreciation      b) straight line depreciation  
 c) reducing balance depreciation      d) none of above
- 2) A nuclear power plant is variably used as a \_\_\_\_\_.  
 a) base load plant      b) peak load plant  
 c) stand by plant      d) none
- 3) The load factor for the peak day of the year determines the required \_\_\_\_\_.  
 a) Water storage      b) Pondage  
 c) Generating capacity      d) None
- 4) Water hammer process in penstock result in \_\_\_\_\_.  
 a) pressure decreases  
 b) noise decreases  
 c) noise increases, pressure increases, velocity decreases  
 d) None
- 5) Minimum pressure occurs in fall flowing power tunnel at the time of \_\_\_\_\_.  
 a) load rejection      b) load acceptance  
 c) head race      d) fail race
- 6) Unit power in a turbine is \_\_\_\_\_.  
 a)  $p/H^{1/2}$       b)  $P/H$   
 c)  $P/H^{3/2}$       d)  $P/H^{3/4}$
- 7) On what factors does the selection of a water turbine depends?  
 a) Speed      b) Nature of load  
 c) Working head      d) All



- 8) Pump storage scheme are used to improve the \_\_\_\_\_.  
a) load factor  
b) power factor  
c) delivery factor  
d) plant capacity factor as well as load factor of the power system
- 9) A turbine is called reaction turbine if at the inlet of turbine, the total energy is \_\_\_\_\_.  
a) kinetic  
b) pressure  
c) kinetic and pressure  
d) none
- 10) When a gate valve, installed in a pressure pipe is suddenly closed, water hammer pressure is caused on the pipe shell, in the portion \_\_\_\_\_.  
a) Downstream of the valve  
b) upstream of the valve  
c) both a & b  
d) none
- 11) In hydro electric power station what is an enlarge body of water just above the intake and used as a regulating reservoir called \_\_\_\_\_.  
a) penstock  
b) spillways  
c) reservoir  
d) fore bay
- 12) Jet ratio 'm' is defined as the ratio of \_\_\_\_\_.  
a) Diameter of jet of water to diameter of pelton wheel  
b) Velocity of vane to velocity of jet of water  
c) Velocity of flow to velocity of jet of water  
d) Diameter of pelton wheel to diameter of jet
- 13) The draft tube is provided to \_\_\_\_\_.  
a) reduce the effect of water hammer  
b) raise the water surface of the stream to create an artificial head  
c) increase the acting head on the water wheel  
d) None of the above
- 14) Surge tank is necessarily provided \_\_\_\_\_.  
a) long penstocks  
b) short length penstocks  
c) surface penstocks  
d) embedded penstocks

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Power Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Use only non-programmable calculator is allowed.  
 4) Draw neat labelled diagrams whenever necessary.

**Section – I**

**Q.2 Solve any four. 16**

- a) What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?
- b) Discuss the merits and demerits of Hydropower as compared to other power plants.
- c) When runoff river plant operates as peak load station with weekly factor of 25% what will be the minimum flow in the river so that the station serve as peak load station? With installed capacity 12000 KN, operating head 15 M and plant efficiency as 85%.
- d) Common load shared by two stations base load plant with 50 MW capacity and other being standby plant with 55 MW capacity. The yearly output for base load station is  $200 \times 10^6$  KWh, and for standby station is  $20 \times 10^6$  KWh. The peak load taken by standby station is 18 MW which works for 2400 hrs during the year. The base load station takes peak load as 30 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.
- e) What do you understand by base load and peak load power plants?

**Q.3 Solve any two. 12**

- a) What do you understand by Run of river plants? What are the parts and arrangement of such plants? Draw a neat sketch.
- b) A penstock, with an internal diameter 1.20 m, supplies water at a head equivalent to  $17.0 \text{ kg/cm}^2$ . There is a possibility of 20% in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be  $1000 \text{ kg/cm}^2$  and 85% resp. Find the wall thickness of penstock.
- c) The 95% dependable discharge of river is  $20 \text{ m}^3/\text{sec}$ . if the head utilized is 25m, calculate.
  - 1) Theoretical HP, and Kw
  - 2) Approximate amount of power outputs
  - 3) Total yearly developable energy
  - 4) Actual capacity that may be installed to utilize all average flow and energy

**Section – II****Q.4 Solve any four.****16**

- a) What are the advantages of reaction turbine over the Pelton wheel turbine in respect of efficiency, size, cost and maintenance?
- b) Explain the function of Anchor block and enlist the forces acting on it.
- c) A power canal, bed width 15m, may be assumed to be rectangular in shape with a steady state of flow of 3m. The canal supplies water to a power house with three turbines, each turbine rated at a discharge of 30 m<sup>3</sup>/s. If the in the power house is suddenly thrown off so that two of the turbines have to be shut down, what would be the height of the surge in the canal.
- d) Power house is equipped with 4 units of vertical shaft Pelton turbines to be coupled with 70000kVA, 3 phase. 50 hertz generation. The generation are provided with 10 pairs of poles. The gross design head is 505m and transmission efficiency of head race tunnel and penstocks together is to be 94percent. The four units together will provide for a power of 348000hp at a guaranteed efficiency of 91 percent. The nozzle efficiency is 0.98.  
Find:
  - 1) the design discharge for the turbine
  - 2) jet dia. and no. of jets
  - 3) the nozzle tip diameter
  - 4) the pitch circle dia. of the wheel
  - 5) the specific speed and
  - 6) number of buckets on the wheel
- e) Enlist the different types of Draft tubes. Sketch any two and write the advantages of them.

**Q.5 Solve any two.****12**

- a) What topographical features are in favour of adopting underground power plant? What are its types? Draw neat layout.
- b) A Closed cycle power plant with gross head 400 m has head race tunnel of 4.5 m dia. and 800 m long. Flow velocity is 8.5m/s and coefficient of friction 0.02 overall efficiency of pumping and generation at 85% and 90% respectively. Calculate plant efficiency.
- c) Describe how ocean tides one generated? also state the limitations of tidal power generation.

Seat No.	
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Set Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Power Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Pump storage scheme are used to improve the \_\_\_\_\_.  
 a) load factor  
 b) power factor  
 c) delivery factor  
 d) plant capacity factor as well as load factor of the power system
- 2) A turbine is called reaction turbine if at the inlet of turbine, the total energy is \_\_\_\_\_.  
 a) kinetic  
 b) pressure  
 c) kinetic and pressure  
 d) none
- 3) When a gate valve, installed in a pressure pipe is suddenly closed, water hammer pressure is caused on the pipe shell, in the portion \_\_\_\_\_.  
 a) Downstream of the valve  
 b) upstream of the valve  
 c) both a & b  
 d) none
- 4) In hydro electric power station what is an enlarge body of water just above the intake and used as a regulating reservoir called \_\_\_\_\_.  
 a) penstock  
 b) spillways  
 c) reservoir  
 d) fore bay
- 5) Jet ratio 'm' is defined as the ratio of \_\_\_\_\_.  
 a) Diameter of jet of water to diameter of pelton wheel  
 b) Velocity of vane to velocity of jet of water  
 c) Velocity of flow to velocity of jet of water  
 d) Diameter of pelton wheel to diameter of jet
- 6) The draft tube is provided to \_\_\_\_\_.  
 a) reduce the effect of water hammer  
 b) raise the water surface of the stream to create an artificial head  
 c) increase the acting head on the water wheel  
 d) None of the above
- 7) Surge tank is necessarily provided \_\_\_\_\_.  
 a) long penstocks  
 b) short length penstocks  
 c) surface penstocks  
 d) embedded penstocks

- 8) Annual depreciation of the plant is proportional to the earning capacity of the plant void \_\_\_\_\_.  
a) sinking fund depreciation      b) straight line depreciation  
c) reducing balance depreciation      d) none of above
- 9) A nuclear power plant is variably used as a \_\_\_\_\_.  
a) base load plant      b) peak load plant  
c) stand by plant      d) none
- 10) The load factor for the peak day of the year determines the required \_\_\_\_\_.  
a) Water storage      b) Pondage  
c) Generating capacity      d) None
- 11) Water hammer process in penstock result in \_\_\_\_\_.  
a) pressure decreases  
b) noise decreases  
c) noise increases, pressure increases, velocity decreases  
d) None
- 12) Minimum pressure occurs in fall flowing power tunnel at the time of \_\_\_\_\_.  
a) load rejection      b) load acceptance  
c) head race      d) fail race
- 13) Unit power in a turbine is \_\_\_\_\_.  
a)  $p/H^{1/2}$       b)  $P/H$   
c)  $P/H^{3/2}$       d)  $P/H^{3/4}$
- 14) On what factors does the selection of a water turbine depends?  
a) Speed      b) Nature of load  
c) Working head      d) All

Seat No.	
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Set	Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Power Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Use only non-programmable calculator is allowed.  
 4) Draw neat labelled diagrams whenever necessary.

**Section – I**

**Q.2 Solve any four. 16**

- a) What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?
- b) Discuss the merits and demerits of Hydropower as compared to other power plants.
- c) When runoff river plant operates as peak load station with weekly factor of 25% what will be the minimum flow in the river so that the station serve as peak load station? With installed capacity 12000 KN, operating head 15 M and plant efficiency as 85%.
- d) Common load shared by two stations base load plant with 50 MW capacity and other being standby plant with 55 MW capacity. The yearly output for base load station is  $200 \times 10^6$  KWh, and for standby station is  $20 \times 10^6$  KWh. The peak load taken by standby station is 18 MW which works for 2400 hrs during the year. The base load station takes peak load as 30 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.
- e) What do you understand by base load and peak load power plants?

**Q.3 Solve any two. 12**

- a) What do you understand by Run of river plants? What are the parts and arrangement of such plants? Draw a neat sketch.
- b) A penstock, with an internal diameter 1.20 m, supplies water at a head equivalent to  $17.0 \text{ kg/cm}^2$ . There is a possibility of 20% in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be  $1000 \text{ kg/cm}^2$  and 85% resp. Find the wall thickness of penstock.
- c) The 95% dependable discharge of river is  $20 \text{ m}^3/\text{sec}$ . if the head utilized is 25m, calculate.
  - 1) Theoretical HP, and Kw
  - 2) Approximate amount of power outputs
  - 3) Total yearly developable energy
  - 4) Actual capacity that may be installed to utilize all average flow and energy

**Section – II****Q.4 Solve any four.****16**

- a) What are the advantages of reaction turbine over the Pelton wheel turbine in respect of efficiency, size, cost and maintenance?
- b) Explain the function of Anchor block and enlist the forces acting on it.
- c) A power canal, bed width 15m, may be assumed to be rectangular in shape with a steady state of flow of 3m. The canal supplies water to a power house with three turbines, each turbine rated at a discharge of 30 m<sup>3</sup>/s. If the in the power house is suddenly thrown off so that two of the turbines have to be shut down, what would be the height of the surge in the canal.
- d) Power house is equipped with 4 units of vertical shaft Pelton turbines to be coupled with 70000kVA, 3 phase. 50 hertz generation. The generation are provided with 10 pairs of poles. The gross design head is 505m and transmission efficiency of head race tunnel and penstocks together is to be 94percent. The four units together will provide for a power of 348000hp at a guaranteed efficiency of 91 percent. The nozzle efficiency is 0.98.  
Find:
  - 1) the design discharge for the turbine
  - 2) jet dia. and no. of jets
  - 3) the nozzle tip diameter
  - 4) the pitch circle dia. of the wheel
  - 5) the specific speed and
  - 6) number of buckets on the wheel
- e) Enlist the different types of Draft tubes. Sketch any two and write the advantages of them.

**Q.5 Solve any two.****12**

- a) What topographical features are in favour of adopting underground power plant? What are its types? Draw neat layout.
- b) A Closed cycle power plant with gross head 400 m has head race tunnel of 4.5 m dia. and 800 m long. Flow velocity is 8.5m/s and coefficient of friction 0.02 overall efficiency of pumping and generation at 85% and 90% respectively. Calculate plant efficiency.
- c) Describe how ocean tides one generated? also state the limitations of tidal power generation.

**Seat  
No.**

Set	R
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## Max. Marks: 70

Marks: 14

14

- Page 9 of 16



- 8) Water hammer process in penstock result in \_\_\_\_\_.  
a) pressure decreases  
b) noise decreases  
c) noise increases, pressure increases, velocity decreases  
d) None
- 9) Minimum pressure occurs in fall flowing power tunnel at the time of \_\_\_\_\_.  
a) load rejection  
b) load acceptance  
c) head race  
d) tail race
- 10) Unit power in a turbine is \_\_\_\_\_.  
a)  $p/H^{1/2}$   
b)  $P/H$   
c)  $P/H^{3/2}$   
d)  $P/H^{3/4}$
- 11) On what factors does the selection of a water turbine depends?  
a) Speed  
b) Nature of load  
c) Working head  
d) All
- 12) Pump storage scheme are used to improve the \_\_\_\_\_.  
a) load factor  
b) power factor  
c) delivery factor  
d) plant capacity factor as well as load factor of the power system
- 13) A turbine is called reaction turbine if at the inlet of turbine, the total energy is \_\_\_\_\_.  
a) kinetic  
b) pressure  
c) kinetic and pressure  
d) none
- 14) When a gate valve, installed in a pressure pipe is suddenly closed, water hammer pressure is caused on the pipe shell, in the portion \_\_\_\_\_.  
a) Downstream of the valve  
b) upstream of the valve  
c) both a & b  
d) none

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Power Engineering**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Assume suitable data wherever needed and mention it clearly.  
3) Use only non-programmable calculator is allowed.  
4) Draw neat labelled diagrams whenever necessary.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?
- b) Discuss the merits and demerits of Hydropower as compared to other power plants.
- c) When runoff river plant operates as peak load station with weekly factor of 25% what will be the minimum flow in the river so that the station serve as peak load station? With installed capacity 12000 KN, operating head 15 M and plant efficiency as 85%.
- d) Common load shared by two stations base load plant with 50 MW capacity and other being standby plant with 55 MW capacity. The yearly output for base load station is  $200 \times 10^6$  KWh, and for standby station is  $20 \times 10^6$  KWh. The peak load taken by standby station is 18 MW which works for 2400 hrs during the year. The base load station takes peak load as 30 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.
- e) What do you understand by base load and peak load power plants?

**Q.3 Solve any two.** **12**

- a) What do you understand by Run of river plants? What are the parts and arrangement of such plants? Draw a neat sketch.
- b) A penstock, with an internal diameter 1.20 m, supplies water at a head equivalent to  $17.0 \text{ kg/cm}^2$ . There is a possibility of 20% in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be  $1000 \text{ kg/cm}^2$  and 85% resp. Find the wall thickness of penstock.
- c) The 95% dependable discharge of river is  $20 \text{ m}^3/\text{sec}$ . if the head utilized is 25m, calculate.
  - 1) Theoretical HP, and Kw
  - 2) Approximate amount of power outputs
  - 3) Total yearly developable energy
  - 4) Actual capacity that may be installed to utilize all average flow and energy

**Section – II****Q.4 Solve any four.****16**

- a) What are the advantages of reaction turbine over the Pelton wheel turbine in respect of efficiency, size, cost and maintenance?
- b) Explain the function of Anchor block and enlist the forces acting on it.
- c) A power canal, bed width 15m, may be assumed to be rectangular in shape with a steady state of flow of 3m. The canal supplies water to a power house with three turbines, each turbine rated at a discharge of 30 m<sup>3</sup>/s. If the in the power house is suddenly thrown off so that two of the turbines have to be shut down, what would be the height of the surge in the canal.
- d) Power house is equipped with 4 units of vertical shaft Pelton turbines to be coupled with 70000kVA, 3 phase. 50 hertz generation. The generation are provided with 10 pairs of poles. The gross design head is 505m and transmission efficiency of head race tunnel and penstocks together is to be 94percent. The four units together will provide for a power of 348000hp at a guaranteed efficiency of 91 percent. The nozzle efficiency is 0.98.  
Find:
  - 1) the design discharge for the turbine
  - 2) jet dia. and no. of jets
  - 3) the nozzle tip diameter
  - 4) the pitch circle dia. of the wheel
  - 5) the specific speed and
  - 6) number of buckets on the wheel
- e) Enlist the different types of Draft tubes. Sketch any two and write the advantages of them.

**Q.5 Solve any two.****12**

- a) What topographical features are in favour of adopting underground power plant? What are its types? Draw neat layout.
- b) A Closed cycle power plant with gross head 400 m has head race tunnel of 4.5 m dia. and 800 m long. Flow velocity is 8.5m/s and coefficient of friction 0.02 overall efficiency of pumping and generation at 85% and 90% respectively. Calculate plant efficiency.
- c) Describe how ocean tides one generated? also state the limitations of tidal power generation.

<b>Seat No.</b>	
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- 8) The draft tube is provided to \_\_\_\_\_.  
a) reduce the effect of water hammer  
b) raise the water surface of the stream to create an artificial head  
c) increase the acting head on the water wheel  
d) None of the above
- 9) Surge tank is necessarily provided \_\_\_\_\_.  
a) long penstocks                      b) short length penstocks  
c) surface penstocks                  d) embedded penstocks
- 10) Annual depreciation of the plant is proportional to the earning capacity of the plant void \_\_\_\_\_.  
a) sinking fund depreciation              b) straight line depreciation  
c) reducing balance depreciation      d) none of above
- 11) A nuclear power plant is variably used as a \_\_\_\_\_.  
a) base load plant                      b) peak load plant  
c) stand by plant                      d) none
- 12) The load factor for the peak day of the year determines the required \_\_\_\_\_.  
a) Water storage                      b) Pondage  
c) Generating capacity                  d) None
- 13) Water hammer process in penstock result in \_\_\_\_\_.  
a) pressure decreases  
b) noise decreases  
c) noise increases, pressure increases, velocity decreases  
d) None
- 14) Minimum pressure occurs in fall flowing power tunnel at the time of \_\_\_\_\_.  
a) load rejection                      b) load acceptance  
c) head race                              d) fail race

<b>Seat No.</b>	
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**Set S**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Power Engineering**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Assume suitable data wherever needed and mention it clearly.  
3) Use only non-programmable calculator is allowed.  
4) Draw neat labelled diagrams whenever necessary.

**Section – I**

**Q.2 Solve any four. 16**

- a) What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?
- b) Discuss the merits and demerits of Hydropower as compared to other power plants.
- c) When runoff river plant operates as peak load station with weekly factor of 25% what will be the minimum flow in the river so that the station serve as peak load station? With installed capacity 12000 KN, operating head 15 M and plant efficiency as 85%.
- d) Common load shared by two stations base load plant with 50 MW capacity and other being standby plant with 55 MW capacity. The yearly output for base load station is  $200 \times 10^6$  KWh, and for standby station is  $20 \times 10^6$  KWh. The peak load taken by standby station is 18 MW which works for 2400 hrs during the year. The base load station takes peak load as 30 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.
- e) What do you understand by base load and peak load power plants?

**Q.3 Solve any two. 12**

- a) What do you understand by Run of river plants? What are the parts and arrangement of such plants? Draw a neat sketch.
- b) A penstock, with an internal diameter 1.20 m, supplies water at a head equivalent to  $17.0 \text{ kg/cm}^2$ . There is a possibility of 20% in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be  $1000 \text{ kg/cm}^2$  and 85% resp. Find the wall thickness of penstock.
- c) The 95% dependable discharge of river is  $20 \text{ m}^3/\text{sec}$ . if the head utilized is 25m, calculate.
  - 1) Theoretical HP, and Kw
  - 2) Approximate amount of power outputs
  - 3) Total yearly developable energy
  - 4) Actual capacity that may be installed to utilize all average flow and energy

**Section – II****Q.4 Solve any four.****16**

- a) What are the advantages of reaction turbine over the Pelton wheel turbine in respect of efficiency, size, cost and maintenance?
- b) Explain the function of Anchor block and enlist the forces acting on it.
- c) A power canal, bed width 15m, may be assumed to be rectangular in shape with a steady state of flow of 3m. The canal supplies water to a power house with three turbines, each turbine rated at a discharge of 30 m<sup>3</sup>/s. If the in the power house is suddenly thrown off so that two of the turbines have to be shut down, what would be the height of the surge in the canal.
- d) Power house is equipped with 4 units of vertical shaft Pelton turbines to be coupled with 70000kVA, 3 phase. 50 hertz generation. The generation are provided with 10 pairs of poles. The gross design head is 505m and transmission efficiency of head race tunnel and penstocks together is to be 94percent. The four units together will provide for a power of 348000hp at a guaranteed efficiency of 91 percent. The nozzle efficiency is 0.98.  
Find:
  - 1) the design discharge for the turbine
  - 2) jet dia. and no. of jets
  - 3) the nozzle tip diameter
  - 4) the pitch circle dia. of the wheel
  - 5) the specific speed and
  - 6) number of buckets on the wheel
- e) Enlist the different types of Draft tubes. Sketch any two and write the advantages of them.

**Q.5 Solve any two.****12**

- a) What topographical features are in favour of adopting underground power plant? What are its types? Draw neat layout.
- b) A Closed cycle power plant with gross head 400 m has head race tunnel of 4.5 m dia. and 800 m long. Flow velocity is 8.5m/s and coefficient of friction 0.02 overall efficiency of pumping and generation at 85% and 90% respectively. Calculate plant efficiency.
- c) Describe how ocean tides one generated? also state the limitations of tidal power generation.

Seat No.	
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Set	P
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Repairs and Rehabilitation of Structures**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figure on right indicates full marks.
  - 4) Assume suitable data wherever needed & mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option.**

**14**

- 1) Who is responsible for the combination of the polymer particles?
  - a) monomer
  - b) nanomer
  - c) tetramer
  - d) crystal
- 2) Which metal is used for making a foamed concrete?
  - a) Aluminum
  - b) Zinc
  - c) a & b both
  - d) none of the above
- 3) Process of maintaining different components of building so that it can provide proper service throughout its working life is known as \_\_\_\_\_.
  - a) Building Maintenance
  - b) Building Management
  - c) Building Service
  - d) All of the above
- 4) \_\_\_\_\_ type of plaster defect generates a series of hair cracks inside the plaster.
  - a) Crazing
  - b) Blistering
  - c) Flaking
  - d) Popping
- 5) Honey combing in concrete is caused due to \_\_\_\_\_.
  - a) Inadequate compaction
  - b) Chemical reaction
  - c) Shock waves
  - d) Lack of curing
- 6) Bacterial concrete is a \_\_\_\_\_ concrete.
  - a) Porous
  - b) Self-healing
  - c) foamed
  - d) vacuum
- 7) Epoxy resins have \_\_\_\_\_.
  - a) poor mechanical strength
  - b) poor thermal strength
  - c) low tensile strength
  - d) none of the above
- 8) One of the testing equipment used for inspection is \_\_\_\_\_.
  - a) Strain Gauge
  - b) Measuring Jar
  - c) Test Tubes
  - d) None of these



- 9) Which NDT test work on the principle of rebound of the elastic mass?
- a) Hammer test
  - b) Ultrasonic test
  - c) Chloride test
  - d) None of the above
- 10) In case of damaged prestressed concrete I girders, \_\_\_\_\_ are used for restoring strength.
- a) Pre-tensioning
  - b) Post-tensioning
  - c) Chemicals
  - d) Dies
- 11) The corrosion of reinforcement due to extreme exposure is common for structure located in \_\_\_\_\_.
- a) Dry conditions
  - b) Costal zones
  - c) Regional zones
  - d) Hot condition
- 12) The structural concrete slab panels can be repaired by \_\_\_\_\_.
- a) Internal Bonding
  - b) External Bonding
  - c) Stress Bonding
  - d) Layered bonding
- 13) A fire detector cannot detect \_\_\_\_\_.
- a) Radiation
  - b) Heat
  - c) Light
  - d) Smoke
- 14) In case of dormant cracks, wider than about 1 mm, it is more economical to use \_\_\_\_\_ technique.
- a) Epoxy resin
  - b) Grouting and sealing
  - c) Tensioning
  - d) Ranging

<b>Seat No.</b>	
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Repairs and Rehabilitation of Structures**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Answer any two questions: 12**
- a) Write a note on fiber reinforced concrete.
  - b) Write a note on methods of repairs of cracks in concrete.
  - c) Describe causes of distress in concrete structures.
- Q.3 Answer any two questions: 16**
- a) Describe Shotcrete and Guniting.
  - b) Explain underpinning and shoring.
  - c) Explain about the importance of maintenance and various facets of maintenance of a concrete structure in detail.

**Section – II**

- Q.4 Answer any two questions: 12**
- a) Write a note on Jacketing of column.
  - b) Write a note on repairs in underwater structures.
  - c) Explain the term Retrofitting and Rehabilitation.
- Q.5 Answer any two questions: 16**
- a) Explain use of sensors for building instrumentation.
  - b) Describe engineered demolition techniques for dilapidated structures.
  - c) Describe with sketches the strengthening methods - Retrofitting, Jacketing used for structures.

<b>Seat No.</b>	
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## Repairs and Rehabilitation of Structures

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
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  - 4) Assume suitable data wherever needed & mention it clearly.

Marks: 14

14

- 1) One of the testing equipment used for inspection is \_\_\_\_\_.
  - a) Strain Gauge
  - b) Measuring Jar
  - c) Test Tubes
  - d) None of these
- 2) Which NDT test work on the principle of rebound of the elastic mass?
  - a) Hammer test
  - b) Ultrasonic test
  - c) Chloride test
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- 3) In case of damaged prestressed concrete I girders, \_\_\_\_\_ are used for restoring strength.
  - a) Pre-tensioning
  - b) Post-tensioning
  - c) Chemicals
  - d) Dies
- 4) The corrosion of reinforcement due to extreme exposure is common for structure located in \_\_\_\_\_.
  - a) Dry conditions
  - b) Coastal zones
  - c) Regional zones
  - d) Hot condition
- 5) The structural concrete slab panels can be repaired by \_\_\_\_\_.
  - a) Internal Bonding
  - b) External Bonding
  - c) Stress Bonding
  - d) Layered bonding
- 6) A fire detector cannot detect \_\_\_\_\_.
  - a) Radiation
  - b) Heat
  - c) Light
  - d) Smoke
- 7) In case of dormant cracks, wider than about 1 mm, it is more economical to use \_\_\_\_\_ technique.
  - a) Epoxy resin
  - b) Grouting and sealing
  - c) Tensioning
  - d) Ranging

- 8) Who is responsible for the combination of the polymer particles?
  - a) monomer
  - b) nanomer
  - c) tetramer
  - d) crystal
- 9) Which metal is used for making a foamed concrete?
  - a) Aluminum
  - b) Zinc
  - c) a & b both
  - d) none of the above
- 10) Process of maintaining different components of building so that it can provide proper service throughout its working life is known as \_\_\_\_\_.
  - a) Building Maintenance
  - b) Building Management
  - c) Building Service
  - d) All of the above
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  - b) poor thermal strength
  - c) low tensile strength
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Seat No.	
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Repairs and Rehabilitation of Structures**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions: 12**

- Write a note on fiber reinforced concrete.
- Write a note on methods of repairs of cracks in concrete.
- Describe causes of distress in concrete structures.

**Q.3 Answer any two questions: 16**

- Describe Shotcrete and Guniting.
- Explain underpinning and shoring.
- Explain about the importance of maintenance and various facets of maintenance of a concrete structure in detail.

**Section – II**

**Q.4 Answer any two questions: 12**

- Write a note on Jacketing of column.
- Write a note on repairs in underwater structures.
- Explain the term Retrofitting and Rehabilitation.

**Q.5 Answer any two questions: 16**

- Explain use of sensors for building instrumentation.
- Describe engineered demolition techniques for dilapidated structures.
- Describe with sketches the strengthening methods - Retrofitting, Jacketing used for structures.

<b>Seat No.</b>	
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Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
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- 3) Figure on right indicates full marks.
- 4) Assume suitable data wherever needed & mention it clearly.

## Marks: 14

14

- 1) The corrosion of reinforcement due to extreme exposure is common for structure located in \_\_\_\_\_.  
a) Dry conditions  
b) Costal zones  
c) Regional zones  
d) Hot condition
- 2) The structural concrete slab panels can be repaired by \_\_\_\_\_.  
a) Internal Bonding  
b) External Bonding  
c) Stress Bonding  
d) Layered bonding
- 3) A fire detector cannot detect \_\_\_\_\_.  
a) Radiation  
b) Heat  
c) Light  
d) Smoke
- 4) In case of dormant cracks, wider than about 1 mm, it is more economical to use \_\_\_\_\_ technique.  
a) Epoxy resin  
b) Grouting and sealing  
c) Tensioning  
d) Ranging
- 5) Who is responsible for the combination of the polymer particles?  
a) monomer  
b) nanomer  
c) tetramer  
d) crystal
- 6) Which metal is used for making a foamed concrete?  
a) Aluminum  
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c) a & b both  
d) none of the above
- 7) Process of maintaining different components of building so that it can provide proper service throughout its working life is known as \_\_\_\_\_.  
a) Building Maintenance  
b) Building Management  
c) Building Service  
d) All of the above

- 8) \_\_\_\_\_ type of plaster defect generates a series of hair cracks inside the plaster.
- |            |               |
|------------|---------------|
| a) Crazing | b) Blistering |
| c) Flaking | d) Popping    |
- 9) Honey combing in concrete is caused due to \_\_\_\_\_.
- |                          |                      |
|--------------------------|----------------------|
| a) Inadequate compaction | b) Chemical reaction |
| c) Shock waves           | d) Lack of curing    |
- 10) Bacterial concrete is a \_\_\_\_\_ concrete.
- |           |                 |
|-----------|-----------------|
| a) Porous | b) Self-healing |
| c) foamed | d) vacuum       |
- 11) Epoxy resins have \_\_\_\_\_.
- |                             |                          |
|-----------------------------|--------------------------|
| a) poor mechanical strength | b) poor thermal strength |
| c) low tensile strength     | d) none of the above     |
- 12) One of the testing equipment used for inspection is \_\_\_\_\_.
- |                 |                  |
|-----------------|------------------|
| a) Strain Gauge | b) Measuring Jar |
| c) Test Tubes   | d) None of these |
- 13) Which NDT test work on the principle of rebound of the elastic mass?
- |                  |                      |
|------------------|----------------------|
| a) Hammer test   | b) Ultrasonic test   |
| c) Chloride test | d) None of the above |
- 14) In case of damaged prestressed concrete I girders, \_\_\_\_\_ are used for restoring strength.
- |                   |                    |
|-------------------|--------------------|
| a) Pre-tensioning | b) Post-tensioning |
| c) Chemicals      | d) Dies            |

<b>Seat No.</b>	
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**Set R**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Repairs and Rehabilitation of Structures**

Day &amp; Date: Tuesday, 14-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any two questions: 12**

- a) Write a note on fiber reinforced concrete.
- b) Write a note on methods of repairs of cracks in concrete.
- c) Describe causes of distress in concrete structures.

**Q.3 Answer any two questions: 16**

- a) Describe Shotcrete and Guniting.
- b) Explain underpinning and shoring.
- c) Explain about the importance of maintenance and various facets of maintenance of a concrete structure in detail.

**Section – II**

**Q.4 Answer any two questions: 12**

- a) Write a note on Jacketing of column.
- b) Write a note on repairs in underwater structures.
- c) Explain the term Retrofitting and Rehabilitation.

**Q.5 Answer any two questions: 16**

- a) Explain use of sensors for building instrumentation.
- b) Describe engineered demolition techniques for dilapidated structures.
- c) Describe with sketches the strengthening methods - Retrofitting, Jacketing used for structures.



Seat No.	
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Set	S
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Repairs and Rehabilitation of Structures**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figure on right indicates full marks.  
4) Assume suitable data wherever needed & mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option.**

**14**

- 1) Bacterial concrete is a \_\_\_\_\_ concrete.
 

a) Porous	b) Self-healing
c) foamed	d) vacuum
- 2) Epoxy resins have \_\_\_\_\_.
 

a) poor mechanical strength	b) poor thermal strength
c) low tensile strength	d) none of the above
- 3) One of the testing equipment used for inspection is \_\_\_\_\_.
 

a) Strain Gauge	b) Measuring Jar
c) Test Tubes	d) None of these
- 4) Which NDT test work on the principle of rebound of the elastic mass?
 

a) Hammer test	b) Ultrasonic test
c) Chloride test	d) None of the above
- 5) In case of damaged prestressed concrete I girders, \_\_\_\_\_ are used for restoring strength.
 

a) Pre-tensioning	b) Post-tensioning
c) Chemicals	d) Dies
- 6) The corrosion of reinforcement due to extreme exposure is common for structure located in \_\_\_\_\_.
 

a) Dry conditions	b) Coastal zones
c) Regional zones	d) Hot condition
- 7) The structural concrete slab panels can be repaired by \_\_\_\_\_.
 

a) Internal Bonding	b) External Bonding
c) Stress Bonding	d) Layered bonding
- 8) A fire detector cannot detect \_\_\_\_\_.
 

a) Radiation	b) Heat
c) Light	d) Smoke

- 9) In case of dormant cracks, wider than about 1 m, it is more economical to use \_\_\_\_\_ technique.
- |                |                         |
|----------------|-------------------------|
| a) Epoxy resin | b) Grouting and sealing |
| c) Tensioning  | d) Ranging              |
- 10) Who is responsible for the combination of the polymer particles?
- |             |            |
|-------------|------------|
| a) monomer  | b) nanomer |
| c) tetramer | d) crystal |
- 11) Which metal is used for making a foamed concrete?
- |               |                      |
|---------------|----------------------|
| a) Aluminum   | b) Zinc              |
| c) a & b both | d) none of the above |
- 12) Process of maintaining different components of building so that it can provide proper service throughout its working life is known as \_\_\_\_\_.
- |                         |                        |
|-------------------------|------------------------|
| a) Building Maintenance | b) Building Management |
| c) Building Service     | d) All of the above    |
- 13) \_\_\_\_\_ type of plaster defect generates a series of hair cracks inside the plaster.
- |            |               |
|------------|---------------|
| a) Crazing | b) Blistering |
| c) Flaking | d) Popping    |
- 14) Honey combing in concrete is caused due to \_\_\_\_\_.
- |                          |                      |
|--------------------------|----------------------|
| a) Inadequate compaction | b) Chemical reaction |
| c) Shock waves           | d) Lack of curing    |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Repairs and Rehabilitation of Structures**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Answer any two questions: 12**
- a) Write a note on fiber reinforced concrete.
  - b) Write a note on methods of repairs of cracks in concrete.
  - c) Describe causes of distress in concrete structures.
- Q.3 Answer any two questions: 16**
- a) Describe Shotcrete and Guniting.
  - b) Explain underpinning and shoring.
  - c) Explain about the importance of maintenance and various facets of maintenance of a concrete structure in detail.

**Section – II**

- Q.4 Answer any two questions: 12**
- a) Write a note on Jacketing of column.
  - b) Write a note on repairs in underwater structures.
  - c) Explain the term Retrofitting and Rehabilitation.
- Q.5 Answer any two questions: 16**
- a) Explain use of sensors for building instrumentation.
  - b) Describe engineered demolition techniques for dilapidated structures.
  - c) Describe with sketches the strengthening methods - Retrofitting, Jacketing used for structures.

Seat No.	
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Set **P**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Air & Noise Pollution and Control**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option.**

**14**

- 1) Seasonal Changes affect the thickness of \_\_\_\_\_ of atmosphere.
  - a) Stratosphere
  - b) Troposphere
  - c) Mesosphere
  - d) Hydrosphere
- 2) The change of air temperature with height influence the upward lift of air pollutant discharge into atmosphere is also known as \_\_\_\_\_.
  - a) Subsidence inversion
  - b) Sub adiabatic lapse rate
  - c) Temperature gradient
  - d) Adiabatic lapse rate
- 3) Instruments used for wind speed record is \_\_\_\_\_.
  - a) Thermometer
  - b) Barometer
  - c) Anemometers
  - d) Solariometer
- 4) The Photochemical smog formation at Los Angeles is a typical example of \_\_\_\_\_ on air pollution.
  - a) Humidity
  - b) Solar Radiation
  - c) Precipitation
  - d) Mixing Height
- 5) \_\_\_\_\_ type of plume is emitted under extreme inversion condition.
  - a) Fanning
  - b) Coning
  - c) Looping
  - d) Lofting
- 6) \_\_\_\_\_ diagram shows the prevailing direction of wind.
  - a) Stack effluent Theories
  - b) Dispersion Model
  - c) Wind Rose
  - d) Stack Height
- 7) The prime factors in order to minimize air pollution problems by site selection are \_\_\_\_\_.
  - a) Potential effects of surrounding area
  - b) Meteorological factors and climate
  - c) Clean air available
  - d) Topographical features
- 8) \_\_\_\_\_ diseases like bronchitis and asthma are aggravated by high concentration of particulate matter, SO<sub>2</sub>, NO<sub>2</sub> and Photochemical Smog.
  - a) Chronic Pulmonary
  - b) Eye Irritation
  - c) Nose and Throat Irritation
  - d) Cancer

- 9) Cyclone Separator works on the principle of \_\_\_\_\_.
  - a) Gravity Force
  - b) Inertia Force
  - c) Centrifugal Force
  - d) None of these
- 10) \_\_\_\_\_ removes both gaseous and Particulate Contaminants.
  - a) Venturi Scrubber
  - b) Gravitational settling Chamber
  - c) Electrostatic Precipitator
  - d) Wet Scrubber
- 11) The Ringelmann scale is a scale for measuring the apparent density of \_\_\_\_\_.
  - a) odour
  - b) noise
  - c) gas
  - d) smoke
- 12) When did Central Pollution Control board establish?
  - a) 1954
  - b) 1964
  - c) 1974
  - d) 1994
- 13) The Unit used for measuring noise pollution is \_\_\_\_\_.
  - a) Joule
  - b) Decibel
  - c) Newton
  - d) Nano Unit
- 14) According to Noise Pollution Rule 2000, the night time noise standard for the educational institute is \_\_\_\_\_.
  - a) 55 dB
  - b) 45 dB
  - c) 50 dB
  - d) 40 dB

Seat No.	
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Set

P

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Air & Noise Pollution and Control**

Day &amp; Date: Tuesday, 14-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:**
- 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
  - 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
  - 3) Use of non-programmable calculator is allowed.
  - 4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain Global effects of Air Pollution and its Climate Change.  | <b>05</b> |
|            | <b>b)</b> Explain meteorological factors influencing air pollution.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain scope of Air Pollution and its sources of Air Pollution.   | <b>05</b> |
|            | <b>b)</b> Explain with neat sketch "Plume Behavior".   | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> What is photochemical smog and explain the theory of formation of smog with respect to nitrogen dioxide? | <b>05</b> |
|            | <b>b)</b> Explain the Mechanism action of air pollutants on Human Health.  | <b>04</b> |
| <b>Q.5</b> | <b>a)</b> Explain in 'Emission Standards' in detail.   | <b>05</b> |
|            | <b>b)</b> Write a short note on 'Acid Rain'.   | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Explain the advantages and disadvantages of Electrostatic Precipitator.  | <b>05</b> |
|            | <b>b)</b> Describe the sources and control of Noise Pollution.   | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> A fabric filter is to be constructed using bags having 30 cm diameter and 5.5 m height. The bag having is to receive 12.7 m <sup>3</sup> /sec air and filtering velocity is restricted to 2.3 m/min. Determine the number of bags required for continuously cleaned operation. | <b>05</b> |
|            | <b>b)</b> Explain with neat sketch and working operation of Settling Chamber.  | <b>04</b> |
| <b>Q.8</b> | <b>a)</b> Explain the causes and effects of Noise Pollution.   | <b>05</b> |
|            | <b>b)</b> Explain the basic concepts of Noise Pollution Standards.   | <b>04</b> |
| <b>Q.9</b> | <b>a)</b> Explain 'Sound Pressure' in detail.  | <b>05</b> |
|            | <b>b)</b> Write a short note on 'Packed Towers' with the help of neat diagram.   | <b>04</b> |

Seat No.	
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Set Q
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Air & Noise Pollution and Control**

Day & Date: Tuesday, 14-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option.**

**14**

- 1) \_\_\_\_\_ diseases like bronchitis and asthma are aggravated by high concentration of particulate matter, SO<sub>2</sub>, NO<sub>2</sub> and Photochemical Smog.
 

a) Chronic Pulmonary	b) Eye Irritation
c) Nose and Throat Irritation	d) Cancer
- 2) Cyclone Separator works on the principle of \_\_\_\_\_.
 

a) Gravity Force	b) Inertia Force
c) Centrifugal Force	d) None of these
- 3) \_\_\_\_\_ removes both gaseous and Particulate Contaminants.
 

a) Venturi Scrubber	b) Gravitational settling Chamber
c) Electrostatic Precipitator	d) Wet Scrubber
- 4) The Ringelmann scale is a scale for measuring the apparent density of \_\_\_\_\_.
 

a) odour	b) noise
c) gas	d) smoke
- 5) When did Central Pollution Control board establish?
 

a) 1954	b) 1964
c) 1974	d) 1994
- 6) The Unit used for measuring noise pollution is \_\_\_\_\_.
 

a) Joule	b) Decibel
c) Newton	d) Nano Unit
- 7) According to Noise Pollution Rule 2000, the night time noise standard for the educational institute is \_\_\_\_\_.
 

a) 55 dB	b) 45 dB
c) 50 dB	d) 40 dB
- 8) Seasonal Changes affect the thickness of \_\_\_\_\_ of atmosphere.
 

a) Stratosphere	b) Troposphere
c) Mesosphere	d) Hydrosphere

- 9) The change of air temperature with height influence the upward lift of air pollutant discharge into atmosphere is also known as \_\_\_\_\_.  
a) Subsidence inversion                      b) Sub adiabatic lapse rate  
c) Temperature gradient                      d) Adiabatic lapse rate
- 10) Instruments used for wind speed record is \_\_\_\_\_.  
a) Thermometer                                  b) Barometer  
c) Anemometers                                  d) Solariometer
- 11) The Photochemical smog formation at Los Angeles is a typical example of \_\_\_\_\_ on air pollution.  
a) Humidity    b) Solar Radiation  
c) Precipitation                                      d) Mixing Height
- 12) \_\_\_\_\_ type of plume is emitted under extreme inversion condition.  
a) Fanning    b) Coning  
c) Looping    d) Lofting
- 13) \_\_\_\_\_ diagram shows the prevailing direction of wind.  
a) Stack effluent Theories                      b) Dispersion Model  
c) Wind Rose    d) Stack Height
- 14) The prime factors in order to minimize air pollution problems by site selection are \_\_\_\_\_.  
a) Potential effects of surrounding area  
b) Meteorological factors and climate  
c) Clean air available  
d) Topographical features



Seat No.	
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Set	Q
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Air & Noise Pollution and Control**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:**
- 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
  - 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
  - 3) Use of non-programmable calculator is allowed.
  - 4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain Global effects of Air Pollution and its Climate Change.  | <b>05</b> |
|            | <b>b)</b> Explain meteorological factors influencing air pollution.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain scope of Air Pollution and its sources of Air Pollution.   | <b>05</b> |
|            | <b>b)</b> Explain with neat sketch "Plume Behavior".   | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> What is photochemical smog and explain the theory of formation of smog with respect to nitrogen dioxide? | <b>05</b> |
|            | <b>b)</b> Explain the Mechanism action of air pollutants on Human Health.  | <b>04</b> |
| <b>Q.5</b> | <b>a)</b> Explain in 'Emission Standards' in detail.   | <b>05</b> |
|            | <b>b)</b> Write a short note on 'Acid Rain'.   | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Explain the advantages and disadvantages of Electrostatic Precipitator.  | <b>05</b> |
|            | <b>b)</b> Describe the sources and control of Noise Pollution.   | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> A fabric filter is to be constructed using bags having 30 cm diameter and 5.5 m height. The bag having is to receive 12.7 m <sup>3</sup> /sec air and filtering velocity is restricted to 2.3 m/min. Determine the number of bags required for continuously cleaned operation. | <b>05</b> |
|            | <b>b)</b> Explain with neat sketch and working operation of Settling Chamber.  | <b>04</b> |
| <b>Q.8</b> | <b>a)</b> Explain the causes and effects of Noise Pollution.   | <b>05</b> |
|            | <b>b)</b> Explain the basic concepts of Noise Pollution Standards.   | <b>04</b> |
| <b>Q.9</b> | <b>a)</b> Explain 'Sound Pressure' in detail.  | <b>05</b> |
|            | <b>b)</b> Write a short note on 'Packed Towers' with the help of neat diagram.   | <b>04</b> |

Set	R
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Max. Marks: 70

Marks: 14

14

- 10) \_\_\_\_\_ diagram shows the prevailing direction of wind.
- a) Stack effluent Theories                      b) Dispersion Model
  - c) Wind Rose                                      d) Stack Height
- 11) The prime factors in order to minimize air pollution problems by site selection are \_\_\_\_\_.
- a) Potential effects of surrounding area
  - b) Meteorological factors and climate
  - c) Clean air available
  - d) Topographical features
- 12) \_\_\_\_\_ diseases like bronchitis and asthma are aggravated by high concentration of particulate matter, SO<sub>2</sub>, NO<sub>2</sub> and Photochemical Smog.
- a) Chronic Pulmonary                      b) Eye Irritation
  - c) Nose and Throat Irritation              d) Cancer
- 13) Cyclone Separator works on the principle of \_\_\_\_\_.
- a) Gravity Force                              b) Inertia Force
  - c) Centrifugal Force                      d) None of these
- 14) \_\_\_\_\_ removes both gaseous and Particulate Contaminants.
- a) Venturi Scrubber                      b) Gravitational settling Chamber
  - c) Electrostatic Precipitator              d) Wet Scrubber

Seat No.	
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Set	R
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Air & Noise Pollution and Control**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:**
- 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
  - 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
  - 3) Use of non-programmable calculator is allowed.
  - 4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain Global effects of Air Pollution and its Climate Change.  | <b>05</b> |
|            | <b>b)</b> Explain meteorological factors influencing air pollution.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain scope of Air Pollution and its sources of Air Pollution.   | <b>05</b> |
|            | <b>b)</b> Explain with neat sketch "Plume Behavior".   | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> What is photochemical smog and explain the theory of formation of smog with respect to nitrogen dioxide? | <b>05</b> |
|            | <b>b)</b> Explain the Mechanism action of air pollutants on Human Health.  | <b>04</b> |
| <b>Q.5</b> | <b>a)</b> Explain in 'Emission Standards' in detail.   | <b>05</b> |
|            | <b>b)</b> Write a short note on 'Acid Rain'.   | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Explain the advantages and disadvantages of Electrostatic Precipitator.  | <b>05</b> |
|            | <b>b)</b> Describe the sources and control of Noise Pollution.   | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> A fabric filter is to be constructed using bags having 30 cm diameter and 5.5 m height. The bag having is to receive 12.7 m <sup>3</sup> /sec air and filtering velocity is restricted to 2.3 m/min. Determine the number of bags required for continuously cleaned operation. | <b>05</b> |
|            | <b>b)</b> Explain with neat sketch and working operation of Settling Chamber.  | <b>04</b> |
| <b>Q.8</b> | <b>a)</b> Explain the causes and effects of Noise Pollution.   | <b>05</b> |
|            | <b>b)</b> Explain the basic concepts of Noise Pollution Standards.   | <b>04</b> |
| <b>Q.9</b> | <b>a)</b> Explain 'Sound Pressure' in detail.  | <b>05</b> |
|            | <b>b)</b> Write a short note on 'Packed Towers' with the help of neat diagram.   | <b>04</b> |

Seat No.	
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Set	S
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Air & Noise Pollution and Control**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option.**

**14**

- 1) \_\_\_\_\_ diagram shows the prevailing direction of wind.
 

a) Stack effluent Theories	b) Dispersion Model
c) Wind Rose	d) Stack Height
- 2) The prime factors in order to minimize air pollution problems by site selection are \_\_\_\_\_.
 

a) Potential effects of surrounding area
b) Meteorological factors and climate
c) Clean air available
d) Topographical features
- 3) \_\_\_\_\_ diseases like bronchitis and asthma are aggravated by high concentration of particulate matter, SO<sub>2</sub>, NO<sub>2</sub> and Photochemical Smog.
 

a) Chronic Pulmonary	b) Eye Irritation
c) Nose and Throat Irritation	d) Cancer
- 4) Cyclone Separator works on the principle of \_\_\_\_\_.
 

a) Gravity Force	b) Inertia Force
c) Centrifugal Force	d) None of these
- 5) \_\_\_\_\_ removes both gaseous and Particulate Contaminants.
 

a) Venturi Scrubber	b) Gravitational settling Chamber
c) Electrostatic Precipitator	d) Wet Scrubber
- 6) The Ringelmann scale is a scale for measuring the apparent density of \_\_\_\_\_.
 

a) odour	b) noise
c) gas	d) smoke
- 7) When did Central Pollution Control board establish?
 

a) 1954	b) 1964
c) 1974	d) 1994
- 8) The Unit used for measuring noise pollution is \_\_\_\_\_.
 

a) Joule	b) Decibel
c) Newton	d) Nano Unit

- 9) According to Noise Pollution Rule 2000, the night time noise standard for the educational institute is \_\_\_\_\_.
  - a) 55 dB
  - b) 45 dB
  - c) 50 dB
  - d) 40 dB
- 10) Seasonal Changes affect the thickness of \_\_\_\_\_ of atmosphere.
  - a) Stratosphere
  - b) Troposphere
  - c) Mesosphere
  - d) Hydrosphere
- 11) The change of air temperature with height influence the upward lift of air pollutant discharge into atmosphere is also known as \_\_\_\_\_.
  - a) Subsidence inversion
  - b) Sub adiabatic lapse rate
  - c) Temperature gradient
  - d) Adiabatic lapse rate
- 12) Instruments used for wind speed record is \_\_\_\_\_.
  - a) Thermometer
  - b) Barometer
  - c) Anemometers
  - d) Solariometer
- 13) The Photochemical smog formation at Los Angeles is a typical example of \_\_\_\_\_ on air pollution.
  - a) Humidity
  - b) Solar Radiation
  - c) Precipitation
  - d) Mixing Height
- 14) \_\_\_\_\_ type of plume is emitted under extreme inversion condition.
  - a) Fanning
  - b) Coning
  - c) Looping
  - d) Lofting

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Air & Noise Pollution and Control**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:**
- 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
  - 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
  - 3) Use of non-programmable calculator is allowed.
  - 4) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain Global effects of Air Pollution and its Climate Change.  | <b>05</b> |
|            | <b>b)</b> Explain meteorological factors influencing air pollution.  | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain scope of Air Pollution and its sources of Air Pollution.   | <b>05</b> |
|            | <b>b)</b> Explain with neat sketch "Plume Behavior".   | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> What is photochemical smog and explain the theory of formation of smog with respect to nitrogen dioxide? | <b>05</b> |
|            | <b>b)</b> Explain the Mechanism action of air pollutants on Human Health.  | <b>04</b> |
| <b>Q.5</b> | <b>a)</b> Explain in 'Emission Standards' in detail.   | <b>05</b> |
|            | <b>b)</b> Write a short note on 'Acid Rain'.   | <b>04</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | <b>a)</b> Explain the advantages and disadvantages of Electrostatic Precipitator.  | <b>05</b> |
|            | <b>b)</b> Describe the sources and control of Noise Pollution.   | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> A fabric filter is to be constructed using bags having 30 cm diameter and 5.5 m height. The bag having is to receive 12.7 m <sup>3</sup> /sec air and filtering velocity is restricted to 2.3 m/min. Determine the number of bags required for continuously cleaned operation. | <b>05</b> |
|            | <b>b)</b> Explain with neat sketch and working operation of Settling Chamber.  | <b>04</b> |
| <b>Q.8</b> | <b>a)</b> Explain the causes and effects of Noise Pollution.   | <b>05</b> |
|            | <b>b)</b> Explain the basic concepts of Noise Pollution Standards.   | <b>04</b> |
| <b>Q.9</b> | <b>a)</b> Explain 'Sound Pressure' in detail.  | <b>05</b> |
|            | <b>b)</b> Write a short note on 'Packed Towers' with the help of neat diagram.   | <b>04</b> |

Seat No.	
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Set	P
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surface Hydrology**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option. 14**

- 1) The monthly rainfall at a place A during September 1996 was recorded as 55 mm above normal. Here, the term normal means \_\_\_\_\_.
  - a) The rainfall in the same month in the previous year
  - b) The rainfall was normally expected based on previous month's data
  - c) The average rainfall computed from past 12 months' record
  - d) The average monthly rainfall for September computed from a specific 30 years of the past record
- 2) The following recording rain-gauges does not produce the mass curve of precipitation as record:
  - a) Symons' rain-gauge
  - b) Tipping bucket type rain-gauge
  - c) Weighing bucket type rain-gauge
  - d) Natural syphon type rain-gauge
- 3) Depth-area-duration curves of precipitation are drawn as \_\_\_\_\_.
  - a) Minimising envelopes through the appropriate data points
  - b) Maximising envelopes through the appropriate data points
  - c) Best-fit mean curves through the appropriate data points
  - d) Best-fit straight through the appropriate data points
- 4) What is the area under a conditional Cumulative density function?
  - a) Zero
  - b) Infinity
  - c) One
  - d) Changes with CDF
- 5) Larger values of  $r^2(R^2)$  imply that the observations are more closely grouped about the \_\_\_\_\_.
  - a) Average value of the independent variables
  - b) Average value of the dependent variable
  - c) Least squares line
  - d) Origin
- 6) In regression analysis, the variable that is used to explain the change in the outcome of an experiment, or some natural process, is called \_\_\_\_\_.
  - a) the independent variable
  - b) the predictor variable
  - c) the explanatory variable
  - d) All of the above



- Page 2 of 16

Seat No.	
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Set **P**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surface Hydrology**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Q. No. 2 and Q. No. 6 are compulsory. Attempt any two questions from the remaining of each section.

**Section – I**

- Q.2 a)** A catchment area has a seven rain-gauge stations. In a year the annual rainfall recorded by the gauges are as follows: **05**

Station	P	Q	R	S	T	U	V
Rainfall (cm)	130.0	142.1	118.2	108.5	165.2	102.1	146.9

For a 5% error in the estimation of the mean rainfall, calculate the minimum number of additional stations required to be established in the catchment.

- b)** Describe the salient characteristics of precipitation on India. **05**

- Q.3 a)** Define Correlation and its types along with graphical representation. **04**

- b)** Analysis of data on maximum one-day rainfall depth at Madras indicated that a depth of 280 mm had a return period of 50 years. Determine the probability of a one-day rainfall depth equal to or greater than 280 mm at Madras occurring (a) Once in 20 successive years, (b) Two times in 15 successive years, and (c) At least once in 20 successive years. **05**

- Q.4 a)** List the factors affecting the seasonal and annual runoff of a catchment. Describe each in detail. **04**

- b)** A small watershed is 250 ha in size has group C soil. The land cover can be classified as 30% open forest and 70% poor quality pasture. Assuming AMC at average condition and the soil to be black cotton soil, estimate the direct runoff volume due to rainfall of 75 mm in one day. Take CN for open forest and Pasture as 60 and 86 respectively. **05**

- Q.5 a)** What is sequent peak algorithm? Discuss the procedure involved in the analysis of sequent peak along with suitable sketches. **04**

- b)** A storm with 10 cm of precipitation produced a direct runoff of 5.8 cm. The duration of the rainfall was 16 hours and its distribution is given as below. Estimate the  $\phi$ -index of the storm. **05**

Time from start (h)	0	2	4	6	8	10	12	14	16
Cumulative rainfall (cm)	0	0.4	1.3	2.8	5.1	6.9	8.5	9.5	10.0

**Section – II**

**Q.6** Given the ordinates of a 4-h unit hydrograph as below: **10**

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate of 4-h UH ( $\text{m}^3/\text{s}$ )	0	20	80	130	150	130	90	52	27	15	5	0

Derive the ordinates of 12-h for the same catchment.

**Q.7 a)** Explain the term Rainfall Excess (ER). How is ERH of a storm obtained? **04**  
**b)** What is an Instantaneous unit-hydrograph? What are the characteristics of IUH? **05**

**Q.8 a)** Distinguish between Storage routing and Channel routing. **04**  
**b)** Route the following flood hydrograph through a river reach for which  $K = 12.0$  h and  $x = 0.15$ . At the start of the inflow flood, the outflow discharge is  $10 \text{ m}^3/\text{s}$ . **05**

Time (h)	0	6	12	18	24	30	36	42	48	54
Inflow ( $\text{m}^3/\text{s}$ )	10	20	50	60	55	45	35	27	20	15

**Q.9 a)** Enlist the major causes of urban flooding. **05**  
**b)** Discuss any two the following in detail: **04**

- 1) Water Sensitive Urban Design (WSUD)
- 2) Low Impact Development (LID)
- 3) Sustainable Urban Drainage System (SUDS)
- 4) Best Management Practices (BMPs)

Seat No.	
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Set	Q
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surface Hydrology**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option.**

**14**

- 1) An IUH is a direct runoff hydrograph of \_\_\_\_\_.
  - a) 1 cm magnitude due to rainfall excess of 1-h duration
  - b) That occurs instantaneously due to rainfall excess of 1-h duration
  - c) Unit rainfall excess precipitating instantaneously over the catchment
  - d) Occurring at any instant in long duration
- 2) The probable maximum flood is \_\_\_\_\_.
  - a) The standard project flood of an extremely large river
  - b) A flood adopted in the design of all kind of spillways
  - c) An extremely large, but physically possible flood in the region
  - d) The maximum possible flood that can occur anywhere in the country
- 3) A bridge is designed for a 50-year flood. The probability that only one flood of the design capacity or higher will occur in the 75 years life of the bridge is \_\_\_\_\_.
 

a) 0.020	b) 0.220
c) 0.786	d) 0.336
- 4) The hydrologic flood routing methods use \_\_\_\_\_.
  - a) Equation of continuity only
  - b) Momentum and Continuity equations both
  - c) Energy equation only
  - d) Equation of motion only
- 5) The Muskingum method of flood routing assumes the storage  $S$  is related to inflow rate  $I$  and outflow rate  $Q$  of a reach as, \_\_\_\_\_.
 

a) $S = K[xI - (1 - x)Q]$	b) $S = K[xQ + (1 - x)I]$
c) $S = K[xI + (1 - x)Q]$	d) $S = Kx[I - (1 - x)Q]$
- 6) Which of the following is not a negative effect of storm water?
 

a) Volume	b) Runoff
c) Potential contaminants	d) Evaporation
- 7) Which of these is a single event?
 

a) Monsoon rain	b) Flash flood
c) Flood	d) Volcanic eruption

- 8) The monthly rainfall at a place A during September 1996 was recorded as 55 mm above normal. Here, the term normal means \_\_\_\_\_.  
a) The rainfall in the same month in the previous year  
b) The rainfall was normally expected based on previous month's data  
c) The average rainfall computed from past 12 months' record  
d) The average monthly rainfall for September computed from a specific 30 years of the past record
- 9) The following recording rain-gauges does not produce the mass curve of precipitation as record:  
a) Symons' rain-gauge  
b) Tipping bucket type rain-gauge  
c) Weighing bucket type rain-gauge  
d) Natural syphon type rain-gauge
- 10) Depth-area-duration curves of precipitation are drawn as \_\_\_\_\_.  
a) Minimising envelopes through the appropriate data points  
b) Maximising envelopes through the appropriate data points  
c) Best-fit mean curves through the appropriate data points  
d) Best-fit straight through the appropriate data points
- 11) What is the area under a conditional Cumulative density function?  
a) Zero  
b) Infinity  
c) One  
d) Changes with CDF
- 12) Larger values of  $r^2(R^2)$  imply that the observations are more closely grouped about the \_\_\_\_\_.  
a) Average value of the independent variables  
b) Average value of the dependent variable  
c) Least squares line  
d) Origin
- 13) In regression analysis, the variable that is used to explain the change in the outcome of an experiment, or some natural process, is called \_\_\_\_\_.  
a) the independent variable  
b) the predictor variable  
c) the explanatory variable  
d) All of the above
- 14) The basic assumptions of the unit-hydrograph theory are \_\_\_\_\_.  
a) Nonlinear response and time invariance  
b) Time invariance and linear response  
c) Linear response and linear time variance  
d) Nonlinear time variance and linear response

Seat No.	
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surface Hydrology**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Q. No. 2 and Q. No. 6 are compulsory. Attempt any two questions from the remaining of each section.

**Section – I**

- Q.2 a)** A catchment area has a seven rain-gauge stations. In a year the annual rainfall recorded by the gauges are as follows: **05**

Station	P	Q	R	S	T	U	V
Rainfall (cm)	130.0	142.1	118.2	108.5	165.2	102.1	146.9

For a 5% error in the estimation of the mean rainfall, calculate the minimum number of additional stations required to be established in the catchment.

- b)** Describe the salient characteristics of precipitation on India. **05**

- Q.3 a)** Define Correlation and its types along with graphical representation. **04**

- b)** Analysis of data on maximum one-day rainfall depth at Madras indicated that a depth of 280 mm had a return period of 50 years. Determine the probability of a one-day rainfall depth equal to or greater than 280 mm at Madras occurring (a) Once in 20 successive years, (b) Two times in 15 successive years, and (c) At least once in 20 successive years. **05**

- Q.4 a)** List the factors affecting the seasonal and annual runoff of a catchment. Describe each in detail. **04**

- b)** A small watershed is 250 ha in size has group C soil. The land cover can be classified as 30% open forest and 70% poor quality pasture. Assuming AMC at average condition and the soil to be black cotton soil, estimate the direct runoff volume due to rainfall of 75 mm in one day. Take CN for open forest and Pasture as 60 and 86 respectively. **05**

- Q.5 a)** What is sequent peak algorithm? Discuss the procedure involved in the analysis of sequent peak along with suitable sketches. **04**

- b)** A storm with 10 cm of precipitation produced a direct runoff of 5.8 cm. The duration of the rainfall was 16 hours and its distribution is given as below. Estimate the  $\phi$ -index of the storm. **05**

Time from start (h)	0	2	4	6	8	10	12	14	16
Cumulative rainfall (cm)	0	0.4	1.3	2.8	5.1	6.9	8.5	9.5	10.0

**Section – II**

**Q.6** Given the ordinates of a 4-h unit hydrograph as below: **10**

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate of 4-h UH ( $\text{m}^3/\text{s}$ )	0	20	80	130	150	130	90	52	27	15	5	0

Derive the ordinates of 12-h for the same catchment.

**Q.7 a)** Explain the term Rainfall Excess (ER). How is ERH of a storm obtained? **04**  
**b)** What is an Instantaneous unit-hydrograph? What are the characteristics of IUH? **05**

**Q.8 a)** Distinguish between Storage routing and Channel routing. **04**  
**b)** Route the following flood hydrograph through a river reach for which  $K = 12.0$  h and  $x = 0.15$ . At the start of the inflow flood, the outflow discharge is  $10 \text{ m}^3/\text{s}$ . **05**

Time (h)	0	6	12	18	24	30	36	42	48	54
Inflow ( $\text{m}^3/\text{s}$ )	10	20	50	60	55	45	35	27	20	15

**Q.9 a)** Enlist the major causes of urban flooding. **05**  
**b)** Discuss any two the following in detail: **04**  
 1) Water Sensitive Urban Design (WSUD)  
 2) Low Impact Development (LID)  
 3) Sustainable Urban Drainage System (SUDS)  
 4) Best Management Practices (BMPs)

Seat No.	
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Set	R
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surface Hydrology**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option.**

**14**

- 1) The hydrologic flood routing methods use \_\_\_\_\_.  
 a) Equation of continuity only  
 b) Momentum and Continuity equations both  
 c) Energy equation only  
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- 2) The Muskingum method of flood routing assumes the storage  $S$  is related to inflow rate  $I$  and outflow rate  $Q$  of a reach as, \_\_\_\_\_.  
 a)  $S = K[xI - (1 - x)Q]$   
 b)  $S = K[xQ + (1 - x)I]$   
 c)  $S = K[xI + (1 - x)Q]$   
 d)  $S = Kx[I - (1 - x)Q]$
- 3) Which of the following is not a negative effect of storm water?  
 a) Volume  
 b) Runoff  
 c) Potential contaminants  
 d) Evaporation
- 4) Which of these is a single event?  
 a) Monsoon rain  
 b) Flash flood  
 c) Flood  
 d) Volcanic eruption
- 5) The monthly rainfall at a place A during September 1996 was recorded as 55 mm above normal. Here, the term normal means \_\_\_\_\_.  
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- 7) Depth-area-duration curves of precipitation are drawn as \_\_\_\_\_.  
a) Minimising envelopes through the appropriate data points  
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a) 1 cm magnitude due to rainfall excess of 1-h duration  
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- 13) The probable maximum flood is \_\_\_\_\_.  
a) The standard project flood of an extremely large river  
b) A flood adopted in the design of all kind of spillways  
c) An extremely large, but physically possible flood in the region  
d) The maximum possible flood that can occur anywhere in the country
- 14) A bridge is designed for a 50-year flood. The probability that only one flood of the design capacity or higher will occur in the 75 years life of the bridge is \_\_\_\_\_.  
a) 0.020  
b) 0.220  
c) 0.786  
d) 0.336

Seat No.	
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Set **R**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surface Hydrology**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Q. No. 2 and Q. No. 6 are compulsory. Attempt any two questions from the remaining of each section.

**Section – I**

- Q.2 a)** A catchment area has a seven rain-gauge stations. In a year the annual rainfall recorded by the gauges are as follows: **05**

Station	P	Q	R	S	T	U	V
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For a 5% error in the estimation of the mean rainfall, calculate the minimum number of additional stations required to be established in the catchment.

- b)** Describe the salient characteristics of precipitation on India. **05**

- Q.3 a)** Define Correlation and its types along with graphical representation. **04**

- b)** Analysis of data on maximum one-day rainfall depth at Madras indicated that a depth of 280 mm had a return period of 50 years. Determine the probability of a one-day rainfall depth equal to or greater than 280 mm at Madras occurring (a) Once in 20 successive years, (b) Two times in 15 successive years, and (c) At least once in 20 successive years. **05**

- Q.4 a)** List the factors affecting the seasonal and annual runoff of a catchment. Describe each in detail. **04**

- b)** A small watershed is 250 ha in size has group C soil. The land cover can be classified as 30% open forest and 70% poor quality pasture. Assuming AMC at average condition and the soil to be black cotton soil, estimate the direct runoff volume due to rainfall of 75 mm in one day. Take CN for open forest and Pasture as 60 and 86 respectively. **05**

- Q.5 a)** What is sequent peak algorithm? Discuss the procedure involved in the analysis of sequent peak along with suitable sketches. **04**

- b)** A storm with 10 cm of precipitation produced a direct runoff of 5.8 cm. The duration of the rainfall was 16 hours and its distribution is given as below. Estimate the  $\phi$ -index of the storm. **05**

Time from start (h)	0	2	4	6	8	10	12	14	16
Cumulative rainfall (cm)	0	0.4	1.3	2.8	5.1	6.9	8.5	9.5	10.0

**Section – II**

**Q.6** Given the ordinates of a 4-h unit hydrograph as below: **10**

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate of 4-h UH ( $\text{m}^3/\text{s}$ )	0	20	80	130	150	130	90	52	27	15	5	0

Derive the ordinates of 12-h for the same catchment.

**Q.7 a)** Explain the term Rainfall Excess (ER). How is ERH of a storm obtained? **04**  
**b)** What is an Instantaneous unit-hydrograph? What are the characteristics of IUH? **05**

**Q.8 a)** Distinguish between Storage routing and Channel routing. **04**  
**b)** Route the following flood hydrograph through a river reach for which  $K = 12.0$  h and  $x = 0.15$ . At the start of the inflow flood, the outflow discharge is  $10 \text{ m}^3/\text{s}$ . **05**

Time (h)	0	6	12	18	24	30	36	42	48	54
Inflow ( $\text{m}^3/\text{s}$ )	10	20	50	60	55	45	35	27	20	15

**Q.9 a)** Enlist the major causes of urban flooding. **05**  
**b)** Discuss any two the following in detail: **04**

- 1) Water Sensitive Urban Design (WSUD)
- 2) Low Impact Development (LID)
- 3) Sustainable Urban Drainage System (SUDS)
- 4) Best Management Practices (BMPs)

Seat No.	
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Set **S**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surface Hydrology**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option.**

**14**

- 1) In regression analysis, the variable that is used to explain the change in the outcome of an experiment, or some natural process, is called \_\_\_\_\_.  
 a) the independent variable                      b) the predictor variable  
 c) the explanatory variable                      d) All of the above
- 2) The basic assumptions of the unit-hydrograph theory are \_\_\_\_\_.  
 a) Nonlinear response and time invariance  
 b) Time invariance and linear response  
 c) Linear response and linear time variance  
 d) Nonlinear time variance and linear response
- 3) An IUH is a direct runoff hydrograph of \_\_\_\_\_.  
 a) 1 cm magnitude due to rainfall excess of 1-h duration  
 b) That occurs instantaneously due to rainfall excess of 1-h duration  
 c) Unit rainfall excess precipitating instantaneously over the catchment  
 d) Occurring at any instant in long duration
- 4) The probable maximum flood is \_\_\_\_\_.  
 a) The standard project flood of an extremely large river  
 b) A flood adopted in the design of all kind of spillways  
 c) An extremely large, but physically possible flood in the region  
 d) The maximum possible flood that can occur anywhere in the country
- 5) A bridge is designed for a 50-year flood. The probability that only one flood of the design capacity or higher will occur in the 75 years life of the bridge is \_\_\_\_\_.  
 a) 0.020    b) 0.220  
 c) 0.786    d) 0.336
- 6) The hydrologic flood routing methods use \_\_\_\_\_.  
 a) Equation of continuity only  
 b) Momentum and Continuity equations both  
 c) Energy equation only  
 d) Equation of motion only

- 7) The Muskingum method of flood routing assumes the storage  $S$  is related to inflow rate  $I$  and outflow rate  $Q$  of a reach as, \_\_\_\_\_.
- a)  $S = K[xI - (1 - x)Q]$       b)  $S = K[xQ + (1 - x)I]$   
 c)  $S = K[xI + (1 - x)Q]$       d)  $S = Kx[I - (1 - x)Q]$
- 8) Which of the following is not a negative effect of storm water?
- a) Volume      b) Runoff  
 c) Potential contaminants      d) Evaporation
- 9) Which of these is a single event?
- a) Monsoon rain      b) Flash flood  
 c) Flood      d) Volcanic eruption
- 10) The monthly rainfall at a place A during September 1996 was recorded as 55 mm above normal. Here, the term normal means \_\_\_\_\_.
- a) The rainfall in the same month in the previous year  
 b) The rainfall was normally expected based on previous month's data  
 c) The average rainfall computed from past 12 months' record  
 d) The average monthly rainfall for September computed from a specific 30 years of the past record
- 11) The following recording rain-gauges does not produce the mass curve of precipitation as record:
- a) Symons' rain-gauge  
 b) Tipping bucket type rain-gauge  
 c) Weighing bucket type rain-gauge  
 d) Natural syphon type rain-gauge
- 12) Depth-area-duration curves of precipitation are drawn as \_\_\_\_\_.
- a) Minimising envelopes through the appropriate data points  
 b) Maximising envelopes through the appropriate data points  
 c) Best-fit mean curves through the appropriate data points  
 d) Best-fit straight through the appropriate data points
- 13) What is the area under a conditional Cumulative density function?
- a) Zero      b) Infinity  
 c) One      d) Changes with CDF
- 14) Larger values of  $r^2(R^2)$  imply that the observations are more closely grouped about the \_\_\_\_\_.
- a) Average value of the independent variables  
 b) Average value of the dependent variable  
 c) Least squares line  
 d) Origin

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Set **S**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surface Hydrology**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Q. No. 2 and Q. No. 6 are compulsory. Attempt any two questions from the remaining of each section.

**Section – I**

- Q.2 a)** A catchment area has a seven rain-gauge stations. In a year the annual rainfall recorded by the gauges are as follows: **05**

Station	P	Q	R	S	T	U	V
Rainfall (cm)	130.0	142.1	118.2	108.5	165.2	102.1	146.9

For a 5% error in the estimation of the mean rainfall, calculate the minimum number of additional stations required to be established in the catchment.

- b)** Describe the salient characteristics of precipitation on India. **05**

- Q.3 a)** Define Correlation and its types along with graphical representation. **04**

- b)** Analysis of data on maximum one-day rainfall depth at Madras indicated that a depth of 280 mm had a return period of 50 years. Determine the probability of a one-day rainfall depth equal to or greater than 280 mm at Madras occurring (a) Once in 20 successive years, (b) Two times in 15 successive years, and (c) At least once in 20 successive years. **05**

- Q.4 a)** List the factors affecting the seasonal and annual runoff of a catchment. Describe each in detail. **04**

- b)** A small watershed is 250 ha in size has group C soil. The land cover can be classified as 30% open forest and 70% poor quality pasture. Assuming AMC at average condition and the soil to be black cotton soil, estimate the direct runoff volume due to rainfall of 75 mm in one day. Take CN for open forest and Pasture as 60 and 86 respectively. **05**

- Q.5 a)** What is sequent peak algorithm? Discuss the procedure involved in the analysis of sequent peak along with suitable sketches. **04**

- b)** A storm with 10 cm of precipitation produced a direct runoff of 5.8 cm. The duration of the rainfall was 16 hours and its distribution is given as below. Estimate the  $\phi$ -index of the storm. **05**

Time from start (h)	0	2	4	6	8	10	12	14	16
Cumulative rainfall (cm)	0	0.4	1.3	2.8	5.1	6.9	8.5	9.5	10.0

**Section – II**

**Q.6** Given the ordinates of a 4-h unit hydrograph as below: **10**

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate of 4-h UH ( $\text{m}^3/\text{s}$ )	0	20	80	130	150	130	90	52	27	15	5	0

Derive the ordinates of 12-h for the same catchment.

**Q.7 a)** Explain the term Rainfall Excess (ER). How is ERH of a storm obtained? **04**  
**b)** What is an Instantaneous unit-hydrograph? What are the characteristics of IUH? **05**

**Q.8 a)** Distinguish between Storage routing and Channel routing. **04**  
**b)** Route the following flood hydrograph through a river reach for which  $K = 12.0$  h and  $x = 0.15$ . At the start of the inflow flood, the outflow discharge is  $10 \text{ m}^3/\text{s}$ . **05**

Time (h)	0	6	12	18	24	30	36	42	48	54
Inflow ( $\text{m}^3/\text{s}$ )	10	20	50	60	55	45	35	27	20	15

**Q.9 a)** Enlist the major causes of urban flooding. **05**  
**b)** Discuss any two the following in detail: **04**

- 1) Water Sensitive Urban Design (WSUD)
- 2) Low Impact Development (LID)
- 3) Sustainable Urban Drainage System (SUDS)
- 4) Best Management Practices (BMPs)

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## Advanced Concrete Technology

Max. Marks: 70

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks: 14

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- Page 1 of 8



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P

**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Concrete Technology**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I Q. No. 2 is compulsory and solve any two questions from remaining questions. (Q. No. 3, 4 and 5)  
 2) In Section – II Q. No. 6 is compulsory and solve any two questions from remaining questions. (Q. No. 7, 8 and 9)  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.  
 5) Assume suitable data if necessary and mention it clearly.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Classify the various concrete chemicals based on their use.  | <b>10</b> |
| <b>Q.3</b> | Compare the relative merits and demerits of various workability tests.   | <b>09</b> |
| <b>Q.4</b> | Discuss the maturity of concrete. How is it measured? What are its uses in concrete industry?  | <b>09</b> |
| <b>Q.5</b> | How can aggregate cause efflorescence in concrete? How does the maximum size of aggregate affect the workability of concrete with given water content? | <b>09</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.6</b> | Describe the methods of manufacturing of ferro-cement.  | <b>10</b> |
| <b>Q.7</b> | What are the particular requirements for pumpability of a concrete mix?   | <b>09</b> |
| <b>Q.8</b> | What are the special precautions to be adopted on the site for efficiently using ready mixed concrete? Explain in detail. | <b>09</b> |
| <b>Q.9</b> | What are the particular problems in pumping lightweight aggregate concrete?   | <b>09</b> |

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## Advanced Concrete Technology

Max. Marks: 70

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks: 14

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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Concrete Technology**

Day & Date: Thursday, 16-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I Q. No. 2 is compulsory and solve any two questions from remaining questions. (Q. No. 3, 4 and 5)  
2) In Section – II Q. No. 6 is compulsory and solve any two questions from remaining questions. (Q. No. 7, 8 and 9)  
3) Figures to the right indicates full marks.  
4) Use of non-programmable calculator is allowed.  
5) Assume suitable data if necessary and mention it clearly.

**Section – I**

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| <b>Q.2</b> | Classify the various concrete chemicals based on their use.  | <b>10</b> |
| <b>Q.3</b> | Compare the relative merits and demerits of various workability tests.   | <b>09</b> |
| <b>Q.4</b> | Discuss the maturity of concrete. How is it measured? What are its uses in concrete industry?  | <b>09</b> |
| <b>Q.5</b> | How can aggregate cause efflorescence in concrete? How does the maximum size of aggregate affect the workability of concrete with given water content? | <b>09</b> |

**Section – II**

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|------------|---|-----------|
| <b>Q.6</b> | Describe the methods of manufacturing of ferro-cement.  | <b>10</b> |
| <b>Q.7</b> | What are the particular requirements for pumpability of a concrete mix?   | <b>09</b> |
| <b>Q.8</b> | What are the special precautions to be adopted on the site for efficiently using ready mixed concrete? Explain in detail. | <b>09</b> |
| <b>Q.9</b> | What are the particular problems in pumping lightweight aggregate concrete?   | <b>09</b> |

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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Concrete Technology**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries two marks.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. (2 marks each)**

**14**

- 1) The strength of light-weight concrete depends upon \_\_\_\_\_.  
 a) Density of concrete                      b) Size of aggregates  
 c) Type of cement                              d) Mix proportion
- 2) The temporary joints left between the subsequent concreting operation is \_\_\_\_\_.  
 a) Contraction joints                              b) Construction joints  
 c) Isolation joints                                  d) Expansion joints
- 3) If the slump of the concrete mix is 75mm, its workability is considered to be \_\_\_\_\_.  
 a) Very high    b) High  
 c) Medium    d) Low
- 4) Fineness of cement is done by the sieve \_\_\_\_\_.  
 a) 600 $\mu$     b) 300 $\mu$   
 c) 150 $\mu$     d) 90 $\mu$
- 5) Which of the following statement(s) is incorrect?  
 a) The use of larger size and/or rounded aggregate gives higher workability.  
 b) For the same water content, use of finer sand increases the workability  
 c) The grading of fine aggregate is more critical than the grading of coarse aggregate for workability  
 d) For high-strength concrete a coarser grading is preferred
- 6) Modulus of elasticity of concrete can be assumed as \_\_\_\_\_.  
 a)  $5000\sqrt{f_{ck}}$     b)  $0.7\sqrt{f_{ck}}$   
 c)  $200\text{ KN/mm}^2$                                       d)  $0.27\sqrt{f_{ck}}$
- 7) To calculate tensile strength of concrete from the compressive strength, the following formula may be used \_\_\_\_\_.  
 a)  $5000\sqrt{f_{ck}}$     b)  $0.7\sqrt{f_{ck}}$   
 c)  $200\text{ KN/mm}^2$                                       d)  $0.27\sqrt{f_{ck}}$

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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Concrete Technology**

Day & Date: Thursday, 16-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I Q. No. 2 is compulsory and solve any two questions from remaining questions. (Q. No. 3, 4 and 5)  
2) In Section – II Q. No. 6 is compulsory and solve any two questions from remaining questions. (Q. No. 7, 8 and 9)  
3) Figures to the right indicates full marks.  
4) Use of non-programmable calculator is allowed.  
5) Assume suitable data if necessary and mention it clearly.

**Section – I**

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| <b>Q.2</b> | Classify the various concrete chemicals based on their use.  | <b>10</b> |
| <b>Q.3</b> | Compare the relative merits and demerits of various workability tests.   | <b>09</b> |
| <b>Q.4</b> | Discuss the maturity of concrete. How is it measured? What are its uses in concrete industry?  | <b>09</b> |
| <b>Q.5</b> | How can aggregate cause efflorescence in concrete? How does the maximum size of aggregate affect the workability of concrete with given water content? | <b>09</b> |

**Section – II**

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| <b>Q.6</b> | Describe the methods of manufacturing of ferro-cement.  | <b>10</b> |
| <b>Q.7</b> | What are the particular requirements for pumpability of a concrete mix?   | <b>09</b> |
| <b>Q.8</b> | What are the special precautions to be adopted on the site for efficiently using ready mixed concrete? Explain in detail. | <b>09</b> |
| <b>Q.9</b> | What are the particular problems in pumping lightweight aggregate concrete?   | <b>09</b> |

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## Advanced Concrete Technology

Max. Marks: 70

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks: 14

14

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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Advanced Concrete Technology**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section – I Q. No. 2 is compulsory and solve any two questions from remaining questions. (Q. No. 3, 4 and 5)  
 2) In Section – II Q. No. 6 is compulsory and solve any two questions from remaining questions. (Q. No. 7, 8 and 9)  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.  
 5) Assume suitable data if necessary and mention it clearly.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Classify the various concrete chemicals based on their use.  | <b>10</b> |
| <b>Q.3</b> | Compare the relative merits and demerits of various workability tests.   | <b>09</b> |
| <b>Q.4</b> | Discuss the maturity of concrete. How is it measured? What are its uses in concrete industry?  | <b>09</b> |
| <b>Q.5</b> | How can aggregate cause efflorescence in concrete? How does the maximum size of aggregate affect the workability of concrete with given water content? | <b>09</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.6</b> | Describe the methods of manufacturing of ferro-cement.  | <b>10</b> |
| <b>Q.7</b> | What are the particular requirements for pumpability of a concrete mix?   | <b>09</b> |
| <b>Q.8</b> | What are the special precautions to be adopted on the site for efficiently using ready mixed concrete? Explain in detail. | <b>09</b> |
| <b>Q.9</b> | What are the particular problems in pumping lightweight aggregate concrete?   | <b>09</b> |

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Set P
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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Bridges**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Culvert is the type of bridge whose span is \_\_\_\_\_.  
 a) Between 6m-60m                      b) Above 60m  
 c) Less than 6m                          d) None of these
- 2) For small bridges, with open foundations, the economical span is approximately equal to \_\_\_\_\_ times height of Pier.  
 a) 2.0    b) 1.2  
 c) 1.0    d) 1.5
- 3) Total load in case of IRC 70R tracked loading is \_\_\_\_\_.  
 a) 700kN                                      b) 710kN  
 c) 1000kN                                    d) 554kN
- 4) For spans greater than 9m, impact factor for wheeled vehicle is \_\_\_\_\_.  
 a) 10%                                        b) 20%  
 c) 25%                                        d) 15%
- 5) The ground contact length of the track of IRC class AA loading is \_\_\_\_\_.  
 a) 3.6m                                        b) 4.57m  
 c) 3.5m                                        d) None of these
- 6) Impact force for IRC class A & B is given by \_\_\_\_\_.  
 a)  $I_f = \frac{AB}{B + L}$                                       b)  $I_f = \frac{B + L}{A}$   
 c)  $I_f = \frac{A}{B + L}$                                       d) None of these
- 7) Total load of class AA wheeled is \_\_\_\_\_.  
 a) 700kN                                      b) 400kN  
 c) 554kN                                      d) 332kN
- 8) Braking force is assumed to act along the line parallel to roadway & \_\_\_\_\_ above it.  
 a) 1.2m                                        b) 1.5m  
 c) 1.8m                                        d) 2.0m



- 9) Solid deck slab is adopted for spans \_\_\_\_\_.  
a) More than 8m                      b) More than 20m  
c) Less than 8m                      d) Between 10-25m
- 10) The pier cap or abutment cap should be of minimum \_\_\_\_\_ concrete.  
a) M20 grade                      b) M25 grade  
c) M30 grade                      d) Any one of these
- 11) Following is not the function of the pier cap or abutment cap \_\_\_\_\_.  
a) Provides immediate bearing surface for the support of the super structure at pier and abutment location  
b) Disperses the strip load from bearing to the substructure evenly.  
c) Prevent rain water from dripping down the sides and ends of the pier.  
d) Resist all horizontal forces acting on bridges.
- 12) In case of urban site, suitable pier is \_\_\_\_\_.  
a) Cellular pier                      b) Trestle pier  
c) Inboard pier                      d) Hammerhead pier
- 13) Fixed bearing allow \_\_\_\_\_.  
a) Rotation only  
b) Translation only  
c) Both rotational as well as translation  
d) Restrict rotation as well as translation
- 14) Two span girder requires \_\_\_\_\_.  
a) Fixed bearing at central support & expansion bearing at the two abutments  
b) Fixed bearing at all supports  
c) Expansion bearing on all supports  
d) Expansion bearing at central support & Fixed bearing at the two abutments

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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Bridges**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 4 is compulsory in section I, and solve any two questions from the remaining.  
 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

**Q.2 Answer any four questions.**

- a) What are the basic components of bridge structure? Explain with the help of Sketch with their functions. **05**  
 b) What is economical span? Derive the equation for the same. **04**

**Q.3 Find the design bending moment of Two-lane bridge solid deck slab for following data: **09****

- a) Effective span- 7 m  
 b) Carriage way width -9 m  
 c) Kerb- 600 x 275 on both side  
 d) Live load- IRC Class A (Two lane)  
 e) Wearing coat - 100 mm thick  
 f) Use M-25 concrete and Fe-415 steel  
 g) Use  $\alpha = 2.82$

**Q.4 A RCC T beam type bridge having deck slab of 225 mm thick, wearing coat of 90 mm thick, three longitudinal girders and five cross girders. Determine the Design bending moment for all the longitudinal girders. Use following additional data **10****

- a) Carriage way width-7.5 m  
 b) Span of bridge -14m  
 c) Live Load - IRC class AA Tracked  
 d) Kerb- 600 mm wide, 400 mm deep  
 e) Web thickness for Longitudinal and cross girder- 300 mm  
 f) Longitudinal Girder spacing - 280 mm  
 g) Use M-30 concrete and Fe -415 steel

**Q.5 Design a slab panel having size of 3 m x 3.5 m. Consider IRC class AA tracked loading. Use Pigeaud's chart. Consider thickness of slab as 200 mm and wearing coat thickness as 80 mm. Use M- 25 concrete and Fe- 415 steel. Refer Fig 1 and 2 for Pigeuad's coefficient. **09****

## Section – II

- Q.6** Verify the adequacy of pier for the following data: **10**  
 Top width of pier- 1.8 m, Height of pier upto springing level -14 m, C/C distance of bearing-1.2 m, Side batter 1:14, HFL-1.2 m below the bearing level. Span of bridge- 14 m, Self weight of the superstructure =200 kN/m, Live load- IRC class AA tracked. Material of pier = M20 concrete.
- Q.7** Verify the suitability of abutment as shown in the fig 7.1 Use following data **09**  
 Density of soil -  $19 \text{ kN/m}^3$ , Friction angle of soil ( $\phi$ )  $31^\circ$   
 Coefficient of friction - 0.6, Live load IRC class AA tracked.

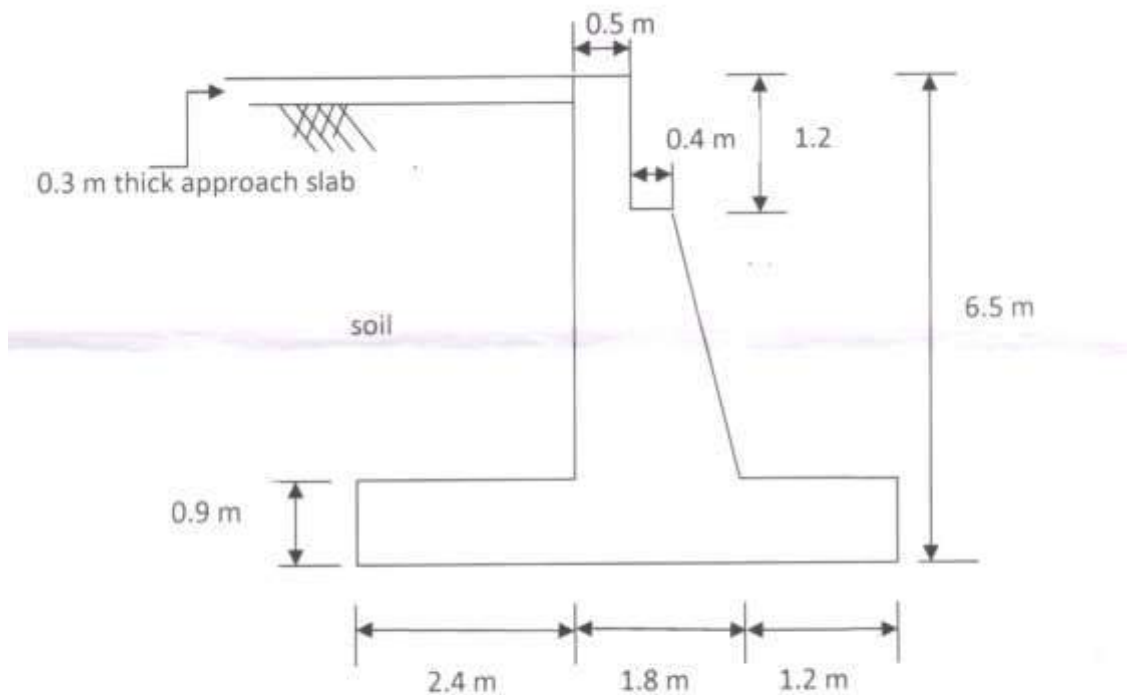


Fig no 7.1

- Q.8 a)** Design a elastomeric unreinforced bearing pad for following data **05**  
 Vertical load (sustained) = 195 kN,  
 Vertical load (dynamic) = 100 kN,  
 Horizontal force = 95 kN  
 Modulus of rigidity of elastomer-1 N/mm<sup>2</sup>  
 coefficient of friction = 0.35
- b)** Write a note on types of expansion joints. **04**
- Q.9 Write a note on following (Any three).** **09**
- Cantilever method of construction
  - Functions of bearing
  - Approach slab
  - Reinforced earth retaining wall
  - Types of bridge inspection

<b>Seat No.</b>	
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**Set Q**

**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Bridges**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Braking force is assumed to act along the line parallel to roadway & \_\_\_\_\_ above it.
 

a) 1.2m	b) 1.5m
c) 1.8m	d) 2.0m
- 2) Solid deck slab is adopted for spans \_\_\_\_\_.
 

a) More than 8m	b) More than 20m
c) Less than 8m	d) Between 10-25m
- 3) The pier cap or abutment cap should be of minimum \_\_\_\_\_ concrete.
 

a) M20 grade	b) M25 grade
c) M30 grade	d) Any one of these
- 4) Following is not the function of the pier cap or abutment cap \_\_\_\_\_.
 

a) Provides immediate bearing surface for the support of the super structure at pier and abutment location
b) Disperses the strip load from bearing to the substructure evenly.
c) Prevent rain water from dripping down the sides and ends of the pier.
d) Resist all horizontal forces acting on bridges.
- 5) In case of urban site, suitable pier is \_\_\_\_\_.
 

a) Cellular pier	b) Trestle pier
c) Inboard pier	d) Hammerhead pier
- 6) Fixed bearing allow \_\_\_\_\_.
 

a) Rotation only
b) Translation only
c) Both rotational as well as translation
d) Restrict rotation as well as translation

- 7) Two span girder requires \_\_\_\_\_.  
 a) Fixed bearing at central support & expansion bearing at the two abutments  
 b) Fixed bearing at all supports  
 c) Expansion bearing on all supports  
 d) Expansion bearing at central support & Fixed bearing at the two abutments
- 8) Culvert is the type of bridge whose span is \_\_\_\_\_.  
 a) Between 6m-60m                      b) Above 60m  
 c) Less than 6m                          d) None of these
- 9) For small bridges, with open foundations, the economical span is approximately equal to \_\_\_\_\_ times height of Pier.  
 a) 2.0    b) 1.2  
 c) 1.0    d) 1.5
- 10) Total load in case of IRC 70R tracked loading is \_\_\_\_\_.  
 a) 700kN                                      b) 710kN  
 c) 1000kN                                    d) 554kN
- 11) For spans greater than 9m, impact factor for wheeled vehicle is \_\_\_\_\_.  
 a) 10%                                        b) 20%  
 c) 25%                                        d) 15%
- 12) The ground contact length of the track of IRC class AA loading is \_\_\_\_\_.  
 a) 3.6m                                        b) 4.57m  
 c) 3.5m                                        d) None of these
- 13) Impact force for IRC class A & B is given by \_\_\_\_\_.  
 a)  $I_f = \frac{AB}{B + L}$                                       b)  $I_f = \frac{B + L}{A}$   
 c)  $I_f = \frac{A}{B + L}$                                       d) None of these
- 14) Total load of class AA wheeled is \_\_\_\_\_.  
 a) 700kN                                      b) 400kN  
 c) 554kN                                      d) 332kN

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Bridges**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 4 is compulsory in section I, and solve any two questions from the remaining.  
 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

**Q.2 Answer any four questions.**

- a) What are the basic components of bridge structure? Explain with the help of Sketch with their functions. **05**  
 b) What is economical span? Derive the equation for the same. **04**

**Q.3 Find the design bending moment of Two-lane bridge solid deck slab for following data: **09****

- a) Effective span- 7 m  
 b) Carriage way width -9 m  
 c) Kerb- 600 x 275 on both side  
 d) Live load- IRC Class A (Two lane)  
 e) Wearing coat - 100 mm thick  
 f) Use M-25 concrete and Fe-415 steel  
 g) Use  $\alpha = 2.82$

**Q.4 A RCC T beam type bridge having deck slab of 225 mm thick, wearing coat of 90 mm thick, three longitudinal girders and five cross girders. Determine the Design bending moment for all the longitudinal girders. Use following additional data **10****

- a) Carriage way width-7.5 m  
 b) Span of bridge -14m  
 c) Live Load - IRC class AA Tracked  
 d) Kerb- 600 mm wide, 400 mm deep  
 e) Web thickness for Longitudinal and cross girder- 300 mm  
 f) Longitudinal Girder spacing - 280 mm  
 g) Use M-30 concrete and Fe -415 steel

**Q.5 Design a slab panel having size of 3 m x 3.5 m. Consider IRC class AA tracked loading. Use Pigeaud's chart. Consider thickness of slab as 200 mm and wearing coat thickness as 80 mm. Use M- 25 concrete and Fe- 415 steel. Refer Fig 1 and 2 for Pigeuad's coefficient. **09****

## Section – II

- Q.6** Verify the adequacy of pier for the following data: **10**  
 Top width of pier- 1.8 m, Height of pier upto springing level -14 m, C/C distance of bearing-1.2 m, Side batter 1:14, HFL-1.2 m below the bearing level. Span of bridge- 14 m, Self weight of the superstructure =200 kN/m, Live load- IRC class AA tracked. Material of pier = M20 concrete.
- Q.7** Verify the suitability of abutment as shown in the fig 7.1 Use following data **09**  
 Density of soil -  $19 \text{ kN/m}^3$ , Friction angle of soil ( $\phi$ )  $31^\circ$   
 Coefficient of friction - 0.6, Live load IRC class AA tracked.

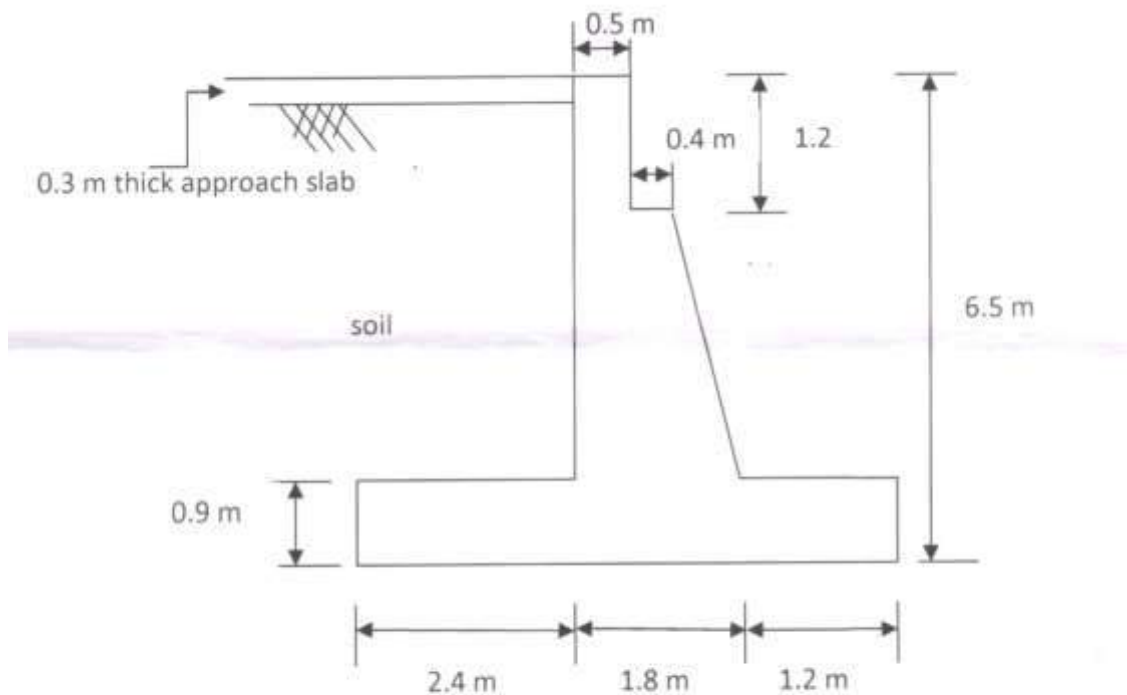


Fig no 7.1

- Q.8** a) Design a elastomeric unreinforced bearing pad for following data **05**  
 Vertical load (sustained) = 195 kN,  
 Vertical load (dynamic) = 100 kN,  
 Horizontal force = 95 kN  
 Modulus of rigidity of elastomer-1 N/mm<sup>2</sup>  
 coefficient of friction = 0.35
- b) Write a note on types of expansion joints. **04**
- Q.9** Write a note on following (Any three). **09**  
 a) Cantilever method of construction  
 b) Functions of bearing  
 c) Approach slab  
 d) Reinforced earth retaining wall  
 e) Types of bridge inspection

<b>Seat No.</b>	
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**Set R**

**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Bridges**

Day & Date: Thursday, 16-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Following is not the function of the pier cap or abutment cap \_\_\_\_\_.
  - a) Provides immediate bearing surface for the support of the super structure at pier and abutment location
  - b) Disperses the strip load from bearing to the substructure evenly.
  - c) Prevent rain water from dripping down the sides and ends of the pier.
  - d) Resist all horizontal forces acting on bridges.
- 2) In case of urban site, suitable pier is \_\_\_\_\_.
  - a) Cellular pier
  - b) Trestle pier
  - c) Inboard pier
  - d) Hammerhead pier
- 3) Fixed bearing allow \_\_\_\_\_.
  - a) Rotation only
  - b) Translation only
  - c) Both rotational as well as translation
  - d) Restrict rotation as well as translation
- 4) Two span girder requires \_\_\_\_\_.
  - a) Fixed bearing at central support & expansion bearing at the two abutments
  - b) Fixed bearing at all supports
  - c) Expansion bearing on all supports
  - d) Expansion bearing at central support & Fixed bearing at the two abutments
- 5) Culvert is the type of bridge whose span is \_\_\_\_\_.
  - a) Between 6m-60m
  - b) Above 60m
  - c) Less than 6m
  - d) None of these
- 6) For small bridges, with open foundations, the economical span is approximately equal to \_\_\_\_\_ times height of Pier.
  - a) 2.0
  - b) 1.2
  - c) 1.0
  - d) 1.5



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Set 

R
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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Bridges**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 4 is compulsory in section I, and solve any two questions from the remaining.  
 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

**Q.2 Answer any four questions.**

- a) What are the basic components of bridge structure? Explain with the help of Sketch with their functions. **05**  
 b) What is economical span? Derive the equation for the same. **04**

**Q.3 Find the design bending moment of Two-lane bridge solid deck slab for following data: **09****

- a) Effective span- 7 m  
 b) Carriage way width -9 m  
 c) Kerb- 600 x 275 on both side  
 d) Live load- IRC Class A (Two lane)  
 e) Wearing coat - 100 mm thick  
 f) Use M-25 concrete and Fe-415 steel  
 g) Use  $\alpha = 2.82$

**Q.4 A RCC T beam type bridge having deck slab of 225 mm thick, wearing coat of 90 mm thick, three longitudinal girders and five cross girders. Determine the Design bending moment for all the longitudinal girders. Use following additional data **10****

- a) Carriage way width-7.5 m  
 b) Span of bridge -14m  
 c) Live Load - IRC class AA Tracked  
 d) Kerb- 600 mm wide, 400 mm deep  
 e) Web thickness for Longitudinal and cross girder- 300 mm  
 f) Longitudinal Girder spacing - 280 mm  
 g) Use M-30 concrete and Fe -415 steel

**Q.5 Design a slab panel having size of 3 m x 3.5 m. Consider IRC class AA tracked loading. Use Pigeaud's chart. Consider thickness of slab as 200 mm and wearing coat thickness as 80 mm. Use M- 25 concrete and Fe- 415 steel. Refer Fig 1 and 2 for Pigeuad's coefficient. **09****

## Section – II

- Q.6** Verify the adequacy of pier for the following data: **10**  
 Top width of pier- 1.8 m, Height of pier upto springing level -14 m, C/C distance of bearing-1.2 m, Side batter 1:14, HFL-1.2 m below the bearing level. Span of bridge- 14 m, Self weight of the superstructure =200 kN/m, Live load- IRC class AA tracked. Material of pier = M20 concrete.
- Q.7** Verify the suitability of abutment as shown in the fig 7.1 Use following data **09**  
 Density of soil -  $19 \text{ kN/m}^3$ , Friction angle of soil ( $\phi$ )  $31^\circ$   
 Coefficient of friction - 0.6, Live load IRC class AA tracked.

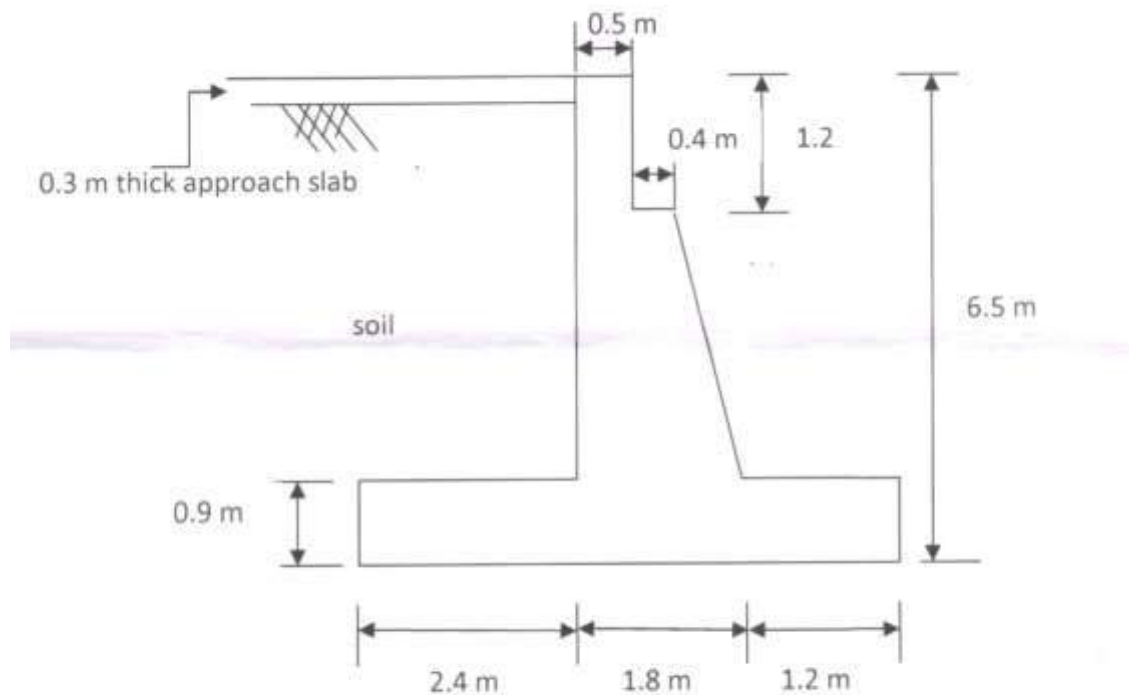


Fig no 7.1

- Q.8** a) Design a elastomeric unreinforced bearing pad for following data **05**  
 Vertical load (sustained) = 195 kN,  
 Vertical load (dynamic) = 100 kN,  
 Horizontal force = 95 kN  
 Modulus of rigidity of elastomer-1 N/mm<sup>2</sup>  
 coefficient of friction = 0.35
- b) Write a note on types of expansion joints. **04**
- Q.9** Write a note on following (Any three). **09**  
 a) Cantilever method of construction  
 b) Functions of bearing  
 c) Approach slab  
 d) Reinforced earth retaining wall  
 e) Types of bridge inspection

Seat No.	
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Set **S**

**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Bridges**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Impact force for IRC class A & B is given by \_\_\_\_\_.
  - a)  $I_f = \frac{AB}{B + L}$
  - b)  $I_f = \frac{B + L}{A}$
  - c)  $I_f = \frac{A}{B + L}$
  - d) None of these
- 2) Total load of class AA wheeled is \_\_\_\_\_.
  - a) 700kN
  - b) 400kN
  - c) 554kN
  - d) 332kN
- 3) Braking force is assumed to act along the line parallel to roadway & \_\_\_\_\_ above it.
  - a) 1.2m
  - b) 1.5m
  - c) 1.8m
  - d) 2.0m
- 4) Solid deck slab is adopted for spans \_\_\_\_\_.
  - a) More than 8m
  - b) More than 20m
  - c) Less than 8m
  - d) Between 10-25m
- 5) The pier cap or abutment cap should be of minimum \_\_\_\_\_ concrete.
  - a) M20 grade
  - b) M25 grade
  - c) M30 grade
  - d) Any one of these
- 6) Following is not the function of the pier cap or abutment cap \_\_\_\_\_.
  - a) Provides immediate bearing surface for the support of the super structure at pier and abutment location
  - b) Disperses the strip load from bearing to the substructure evenly.
  - c) Prevent rain water from dripping down the sides and ends of the pier.
  - d) Resist all horizontal forces acting on bridges.
- 7) In case of urban site, suitable pier is \_\_\_\_\_.
  - a) Cellular pier
  - b) Trestle pier
  - c) Inboard pier
  - d) Hammerhead pier

- 8) Fixed bearing allow \_\_\_\_\_.  
a) Rotation only  
b) Translation only  
c) Both rotational as well as translation  
d) Restrict rotation as well as translation
- 9) Two span girder requires \_\_\_\_\_.  
a) Fixed bearing at central support & expansion bearing at the two abutments  
b) Fixed bearing at all supports  
c) Expansion bearing on all supports  
d) Expansion bearing at central support & Fixed bearing at the two abutments
- 10) Culvert is the type of bridge whose span is \_\_\_\_\_.  
a) Between 6m-60m  
b) Above 60m  
c) Less than 6m  
d) None of these
- 11) For small bridges, with open foundations, the economical span is approximately equal to \_\_\_\_\_ times height of Pier.  
a) 2.0  
b) 1.2  
c) 1.0  
d) 1.5
- 12) Total load in case of IRC 70R tracked loading is \_\_\_\_\_.  
a) 700kN  
b) 710kN  
c) 1000kN  
d) 554kN
- 13) For spans greater than 9m, impact factor for wheeled vehicle is \_\_\_\_\_.  
a) 10%  
b) 20%  
c) 25%  
d) 15%
- 14) The ground contact length of the track of IRC class AA loading is \_\_\_\_\_.  
a) 3.6m  
b) 4.57m  
c) 3.5m  
d) None of these

<b>Seat No.</b>	
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**Fourth Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design of Bridges**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 4 is compulsory in section I, and solve any two questions from the remaining.  
 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

**Q.2 Answer any four questions.**

- a) What are the basic components of bridge structure? Explain with the help of Sketch with their functions. **05**  
 b) What is economical span? Derive the equation for the same. **04**

**Q.3 Find the design bending moment of Two-lane bridge solid deck slab for following data: **09****

- a) Effective span- 7 m  
 b) Carriage way width -9 m  
 c) Kerb- 600 x 275 on both side  
 d) Live load- IRC Class A (Two lane)  
 e) Wearing coat - 100 mm thick  
 f) Use M-25 concrete and Fe-415 steel  
 g) Use  $\alpha = 2.82$

**Q.4 A RCC T beam type bridge having deck slab of 225 mm thick, wearing coat of 90 mm thick, three longitudinal girders and five cross girders. Determine the Design bending moment for all the longitudinal girders. Use following additional data **10****

- a) Carriage way width-7.5 m  
 b) Span of bridge -14m  
 c) Live Load - IRC class AA Tracked  
 d) Kerb- 600 mm wide, 400 mm deep  
 e) Web thickness for Longitudinal and cross girder- 300 mm  
 f) Longitudinal Girder spacing - 280 mm  
 g) Use M-30 concrete and Fe -415 steel

**Q.5 Design a slab panel having size of 3 m x 3.5 m. Consider IRC class AA tracked loading. Use Pigeaud's chart. Consider thickness of slab as 200 mm and wearing coat thickness as 80 mm. Use M- 25 concrete and Fe- 415 steel. Refer Fig 1 and 2 for Pigeuad's coefficient. **09****

## Section – II

- Q.6** Verify the adequacy of pier for the following data: **10**  
 Top width of pier- 1.8 m, Height of pier upto springing level -14 m, C/C distance of bearing-1.2 m, Side batter 1:14, HFL-1.2 m below the bearing level. Span of bridge- 14 m, Self weight of the superstructure =200 kN/m, Live load- IRC class AA tracked. Material of pier = M20 concrete.
- Q.7** Verify the suitability of abutment as shown in the fig 7.1 Use following data **09**  
 Density of soil -  $19 \text{ kN/m}^3$ , Friction angle of soil ( $\phi$ )  $31^\circ$   
 Coefficient of friction - 0.6, Live load IRC class AA tracked.

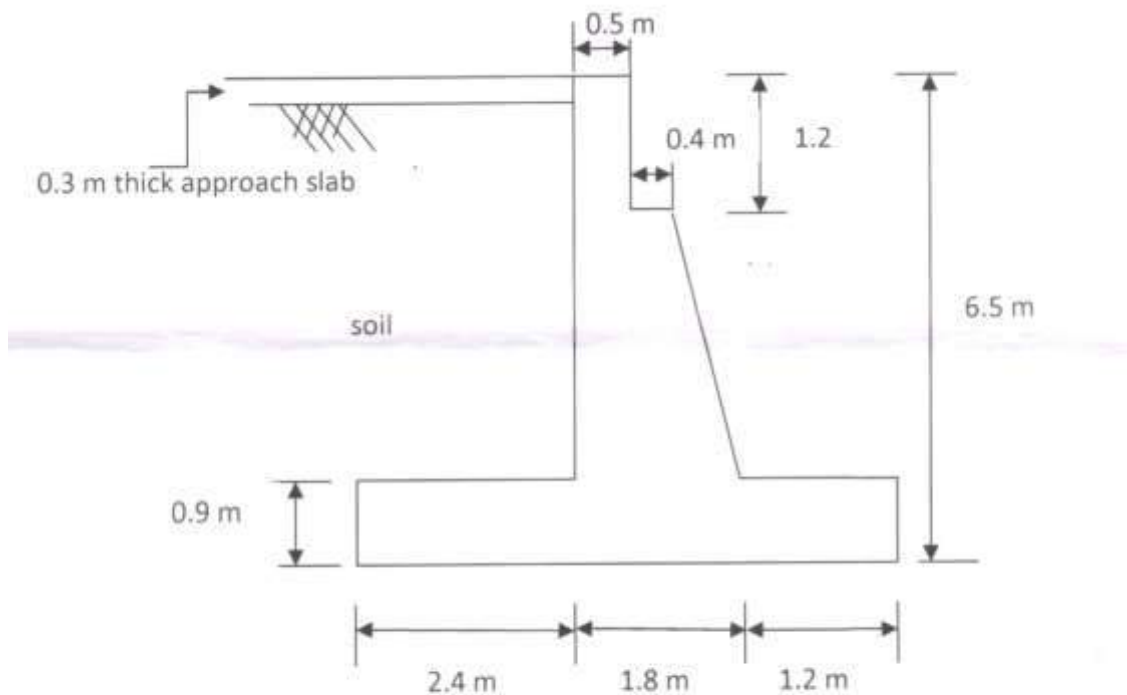


Fig no 7.1

- Q.8** a) Design a elastomeric unreinforced bearing pad for following data **05**  
 Vertical load (sustained) = 195 kN,  
 Vertical load (dynamic) = 100 kN,  
 Horizontal force = 95 kN  
 Modulus of rigidity of elastomer-1 N/mm<sup>2</sup>  
 coefficient of friction = 0.35
- b) Write a note on types of expansion joints. **04**
- Q.9** Write a note on following (Any three). **09**  
 a) Cantilever method of construction  
 b) Functions of bearing  
 c) Approach slab  
 d) Reinforced earth retaining wall  
 e) Types of bridge inspection

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Railway & Harbour Engineering**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Once the head wore out during service, the rail could be inverted and reused. In which type of the rail this facility is available?
  - a) Double headed rail
  - b) Bull Headed rail
  - c) Flat footed rail
  - d) Both Bull headed and Double headed rails
- 2) For a sleeper density of  $(n+6)$ , number of sleepers required for constructing a Broad Gauge (BG) railway track of length 650m is: \_\_\_\_\_.
  - a) 975
  - b) 918
  - c) 950
  - d) 980
- 3) Bearing plates are used to fix \_\_\_\_\_.
  - a) Flat footed rails to the wooden sleepers
  - b) Double headed rails to the wooden sleepers
  - c) Bull headed rails to the wooden sleepers
  - d) Flat footed rails to the cast iron sleepers
- 4) The standard length of rail for Broad Gauge and Meter Gauge are respectively, \_\_\_\_\_.
  - a) 12m and 12m
  - b) 13m and 12m
  - c) 12m and 13m
  - d) 13m and 13m
- 5) Longitudinal movement of rails with respect to sleepers is called?
  - a) Coning of wheels
  - b) Creep of rails
  - c) Wear of rails
  - d) Tilting of rails
- 6) The angle between the gauge faces of the stock rail and tongue rail is called?
  - a) Switch angle
  - b) Angle of crossing
  - c) Angle of turnout
  - d) None of these



- | List-I |                 | List-II |                  |
|--------|-----------------|---------|------------------|
| A      | Outer signal    | 1       | Departure signal |
| B      | Starter Signal  | 2       | Reception signal |
| C      | Repeater signal | 3       | Shunting signal  |
| D      | Disc signal     | 4       | Co-acting signal |

	A	B	C	D
a)	3	4	1	2
b)	2	1	4	3
c)	3	1	4	2
d)	2	4	1	3

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<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Railway & Harbour Engineering**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) In Section-I, Q. No. 2 is compulsory and solve any ONE full question from remaining questions Q. No. 3 and 4.  
 4) In Section-II, Q. No. 5 is compulsory and solve any full ONE full question from remaining questions Q. No. 6 and 7.

**Section – I**

**Q.2 Answer any two questions** **10**

- a) What do you understand by gauge? Mention the different gauges used on Indian Railways and its suitability.
- b) Discuss the necessity and effects of coning of wheels and tilting of rails.
- c) Draw a neat sketch of a left-hand-turn out and name its various components. Describe any one method of designing a turnout.

**Q.3 Answer any three questions** **18**

- a) Calculate the superelevation and the maximum permissible speed for a  $2^\circ$  BG transitioned curve on a high-speed route with a maximum sanctioned speed of 110 km/h. The speed for calculating the equilibrium superelevation as decided by the chief engineer is 80 km/h and the booked speed of goods trains is 50 km/h. Assume  $G=1750\text{mm}$  and  $\text{Radius}=875\text{m}$ .
- b) Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22tonne each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. Assume the coefficient of friction to be 0.2.
- c) If a  $8^\circ$  curve track diverges from a main curve of  $5^\circ$  in an opposite direction in the layout of B. G. Yard, calculate the super elevation and the speed on the branch line, if the maximum speed permitted on the main line is 45 kmph. Assume any data required suitably. Use 30m arc length.
- d) What is superelevation? Why is it necessary to provide superelevation on the curves of a railway track?

**Q.4 Answer any three questions** **18**

- a) What is meant by a crossing number and a crossing angle? How is crossing angle determined? Explain methods for the same.
- b) Differentiate between the following:
  - 1) Reception signals and departure signals
  - 2) Semaphore signal and warner signal
  - 3) Repeating signal and co-acting signal

- c) Illustrate the working principle of key interlocking and mechanical interlocking with merits and de-merits.
- d) Compare the various characteristics of steam, diesel and electric traction.

### Section – II

#### Q.5 Answer any two questions

10

- a) What are the imaginary surfaces? Explain any two imaginary surfaces with neat sketch.
- b) What is a wind rose diagram? What are its types and explain any one with neat sketch?
- c) What are the fenders? Why are they used? Describe various types of fenders with sketches.

#### Q.6 Answer any three questions

18

- a) Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is  $35^\circ$  and the maximum turn-off speed is 80 kmph. Assume radius of entrance curve = 731m, runway width = 45m, taxiway width = 22.5m. Draw a neat sketch showing all the design elements. Assume the separation clearance as 217.75m
- b) Define breakwater and list the different types of breakwaters. Explain any one with neat sketch.
- c) What are dolphins? Describe their types.
- d) Explain with neat sketches the limiting heights of objects in the approach and turning zone of an instrumental runway.

#### Q.7 Answer any three questions

18

- a) Explain how the basic runway length is determined on the basis of the performance characteristics of jet and conventional engine aircrafts.
- b) The length of a runway under standard conditions is 2100m. The airport is to be provided at elevation of 410m above the mean sea level. The airport reference temperature is  $32^\circ\text{C}$ . Determine the length of runway. Apply corrections for elevation and temperature as per ICAO and for gradient as per FAA specifications. The construction plan provides following data:

End to end of runway (m) 0-320	0 to 320	300 to 900	900 to 1500	1500 to 1800	1800 to 2100	2100 to 2700	2700 to 3000
Grade (%)	+1.00	-0.50	+0.50	+ 1.00	-0.50	-0.40	-0.10

- c) Draw a neat sketch of dry dock (plan and section) and label all components, and explain the working principle of dry dock.
- d) Determine the turning radius of the taxiway for a supersonic transport aircraft with a wheel base of 30m and tread of main landing gear as 7.2 m for a design turning speed of 60kmph. Assume co-efficient of friction between tyre and pavement surface as 0.13 and width of taxiway pavement as 22.50m.

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Set	Q
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Railway & Harbour Engineering**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Match List-I (Signals) with List-II (Function) and select the correct answer using the code given below:

List-I		List-II	
A	Outer signal	1	Departure signal
B	Starter Signal	2	Reception signal
C	Repeater signal	3	Shunting signal
D	Disc signal	4	Co-acting signal

Codes:

- |    |   |   |   |   |
|----|---|---|---|---|
|    | A | B | C | D |
| a) | 3 | 4 | 1 | 2 |
| b) | 2 | 1 | 4 | 3 |
| c) | 3 | 1 | 4 | 2 |
| d) | 2 | 4 | 1 | 3 |
- 2) In type-II Windrose Diagram covers \_\_\_\_\_.  
 a) Direction and duration of Wind  
 b) Only Duration of Wind  
 c) Only Direction of Wind  
 d) Direction, duration and intensity of wind
- 3) Which one of the following instance of performance of aircraft is not considered for determining basic runway length?  
 a) Normal Landing Case                      b) Normal take-off case  
 c) Engine failure case                      d) Emergency landing case
- 4) The runway length after correcting for elevation and temperature is 2845m. If the effective gradient on runway is 0.5%, then the revised runway length will be: \_\_\_\_\_.  
 a) 2845m    b) 2910m  
 c) 3030m    d) 3130m
- 5) The phenomenon of movement and deposition of sand in a zig-zag style due to drifting of sand in the vicinity of coast is called:  
 a) Littoral drift                                  b) Sedimentation  
 c) Beach drift                                    d) Trough action

- 6) \_\_\_\_\_ is a structure constructed at the tip of a breakwater near the harbour entrance.
- a) Dolphin
  - b) Wharf
  - c) Pier heads
  - d) Jetties
- 7) Slip is the space of water area between two \_\_\_\_\_.
- a) Adjacent fenders
  - b) Adjacent piers
  - c) Adjacent jetties
  - d) Adjacent dolphins
- 8) Once the head wore out during service, the rail could be inverted and reused. In which type of the rail this facility is available?
- a) Double headed rail
  - b) Bull Headed rail
  - c) Flat footed rail
  - d) Both Bull headed and Double headed rails
- 9) For a sleeper density of  $(n+6)$ , number of sleepers required for constructing a Broad Gauge (BG) railway track of length 650m is: \_\_\_\_\_.
- a) 975
  - b) 918
  - c) 950
  - d) 980
- 10) Bearing plates are used to fix \_\_\_\_\_.
- a) Flat footed rails to the wooden sleepers
  - b) Double headed rails to the wooden sleepers
  - c) Bull headed rails to the wooden sleepers
  - d) Flat footed rails to the cast iron sleepers
- 11) The standard length of rail for Broad Gauge and Meter Gauge are respectively, \_\_\_\_\_.
- a) 12m and 12m
  - b) 13m and 12m
  - c) 12m and 13m
  - d) 13m and 13m
- 12) Longitudinal movement of rails with respect to sleepers is called?
- a) Coning of wheels
  - b) Creep of rails
  - c) Wear of rails
  - d) Tilting of rails
- 13) The angle between the gauge faces of the stock rail and tongue rail is called?
- a) Switch angle
  - b) Angle of crossing
  - c) Angle of turnout
  - d) None of these
- 14) Which one of the following types of steel is used in the manufacturing of metro and mono rails?
- a) Mild Steel
  - b) Cast steel
  - c) Manganese Steel
  - d) Bessemer Steel

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Railway & Harbour Engineering**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) In Section-I, Q. No. 2 is compulsory and solve any ONE full question from remaining questions Q. No. 3 and 4.  
 4) In Section-II, Q. No. 5 is compulsory and solve any full ONE full question from remaining questions Q. No. 6 and 7.

**Section – I**

**Q.2 Answer any two questions** **10**

- What do you understand by gauge? Mention the different gauges used on Indian Railways and its suitability.
- Discuss the necessity and effects of coning of wheels and tilting of rails.
- Draw a neat sketch of a left-hand-turn out and name its various components. Describe any one method of designing a turnout.

**Q.3 Answer any three questions** **18**

- Calculate the superelevation and the maximum permissible speed for a  $2^\circ$  BG transitioned curve on a high-speed route with a maximum sanctioned speed of 110 km/h. The speed for calculating the equilibrium superelevation as decided by the chief engineer is 80 km/h and the booked speed of goods trains is 50 km/h. Assume  $G=1750\text{mm}$  and  $\text{Radius}=875\text{m}$ .
- Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22tonne each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. Assume the coefficient of friction to be 0.2.
- If a  $8^\circ$  curve track diverges from a main curve of  $5^\circ$  in an opposite direction in the layout of B. G. Yard, calculate the super elevation and the speed on the branch line, if the maximum speed permitted on the main line is 45 kmph. Assume any data required suitably. Use 30m arc length.
- What is superelevation? Why is it necessary to provide superelevation on the curves of a railway track?

**Q.4 Answer any three questions** **18**

- What is meant by a crossing number and a crossing angle? How is crossing angle determined? Explain methods for the same.
- Differentiate between the following:
  - Reception signals and departure signals
  - Semaphore signal and warner signal
  - Repeating signal and co-acting signal

- c) Illustrate the working principle of key interlocking and mechanical interlocking with merits and de-merits.
- d) Compare the various characteristics of steam, diesel and electric traction.

### Section – II

#### Q.5 Answer any two questions

10

- a) What are the imaginary surfaces? Explain any two imaginary surfaces with neat sketch.
- b) What is a wind rose diagram? What are its types and explain any one with neat sketch?
- c) What are the fenders? Why are they used? Describe various types of fenders with sketches.

#### Q.6 Answer any three questions

18

- a) Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is  $35^\circ$  and the maximum turn-off speed is 80 kmph. Assume radius of entrance curve = 731m, runway width = 45m, taxiway width = 22.5m. Draw a neat sketch showing all the design elements. Assume the separation clearance as 217.75m
- b) Define breakwater and list the different types of breakwaters. Explain any one with neat sketch.
- c) What are dolphins? Describe their types.
- d) Explain with neat sketches the limiting heights of objects in the approach and turning zone of an instrumental runway.

#### Q.7 Answer any three questions

18

- a) Explain how the basic runway length is determined on the basis of the performance characteristics of jet and conventional engine aircrafts.
- b) The length of a runway under standard conditions is 2100m. The airport is to be provided at elevation of 410m above the mean sea level. The airport reference temperature is  $32^\circ\text{C}$ . Determine the length of runway. Apply corrections for elevation and temperature as per ICAO and for gradient as per FAA specifications. The construction plan provides following data:

End to end of runway (m) 0-320	0 to 320	300 to 900	900 to 1500	1500 to 1800	1800 to 2100	2100 to 2700	2700 to 3000
Grade (%)	+1.00	-0.50	+0.50	+ 1.00	-0.50	-0.40	-0.10

- c) Draw a neat sketch of dry dock (plan and section) and label all components, and explain the working principle of dry dock.
- d) Determine the turning radius of the taxiway for a supersonic transport aircraft with a wheel base of 30m and tread of main landing gear as 7.2 m for a design turning speed of 60kmph. Assume co-efficient of friction between tyre and pavement surface as 0.13 and width of taxiway pavement as 22.50m.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Railway & Harbour Engineering**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) In Section-I, Q. No. 2 is compulsory and solve any ONE full question from remaining questions Q. No. 3 and 4.  
 4) In Section-II, Q. No. 5 is compulsory and solve any full ONE full question from remaining questions Q. No. 6 and 7.

**Section – I**

**Q.2 Answer any two questions** **10**

- What do you understand by gauge? Mention the different gauges used on Indian Railways and its suitability.
- Discuss the necessity and effects of coning of wheels and tilting of rails.
- Draw a neat sketch of a left-hand-turn out and name its various components. Describe any one method of designing a turnout.

**Q.3 Answer any three questions** **18**

- Calculate the superelevation and the maximum permissible speed for a  $2^\circ$  BG transitioned curve on a high-speed route with a maximum sanctioned speed of 110 km/h. The speed for calculating the equilibrium superelevation as decided by the chief engineer is 80 km/h and the booked speed of goods trains is 50 km/h. Assume  $G=1750\text{mm}$  and  $\text{Radius}=875\text{m}$ .
- Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22tonne each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. Assume the coefficient of friction to be 0.2.
- If a  $8^\circ$  curve track diverges from a main curve of  $5^\circ$  in an opposite direction in the layout of B. G. Yard, calculate the super elevation and the speed on the branch line, if the maximum speed permitted on the main line is 45 kmph. Assume any data required suitably. Use 30m arc length.
- What is superelevation? Why is it necessary to provide superelevation on the curves of a railway track?

**Q.4 Answer any three questions** **18**

- What is meant by a crossing number and a crossing angle? How is crossing angle determined? Explain methods for the same.
- Differentiate between the following:
  - Reception signals and departure signals
  - Semaphore signal and warner signal
  - Repeating signal and co-acting signal

- c) Illustrate the working principle of key interlocking and mechanical interlocking with merits and de-merits.
- d) Compare the various characteristics of steam, diesel and electric traction.

### Section – II

#### Q.5 Answer any two questions

10

- a) What are the imaginary surfaces? Explain any two imaginary surfaces with neat sketch.
- b) What is a wind rose diagram? What are its types and explain any one with neat sketch?
- c) What are the fenders? Why are they used? Describe various types of fenders with sketches.

#### Q.6 Answer any three questions

18

- a) Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is  $35^\circ$  and the maximum turn-off speed is 80 kmph. Assume radius of entrance curve = 731m, runway width = 45m, taxiway width = 22.5m. Draw a neat sketch showing all the design elements. Assume the separation clearance as 217.75m
- b) Define breakwater and list the different types of breakwaters. Explain any one with neat sketch.
- c) What are dolphins? Describe their types.
- d) Explain with neat sketches the limiting heights of objects in the approach and turning zone of an instrumental runway.

#### Q.7 Answer any three questions

18

- a) Explain how the basic runway length is determined on the basis of the performance characteristics of jet and conventional engine aircrafts.
- b) The length of a runway under standard conditions is 2100m. The airport is to be provided at elevation of 410m above the mean sea level. The airport reference temperature is  $32^\circ\text{C}$ . Determine the length of runway. Apply corrections for elevation and temperature as per ICAO and for gradient as per FAA specifications. The construction plan provides following data:

End to end of runway (m) 0-320	0 to 320	300 to 900	900 to 1500	1500 to 1800	1800 to 2100	2100 to 2700	2700 to 3000
Grade (%)	+1.00	-0.50	+0.50	+ 1.00	-0.50	-0.40	-0.10

- c) Draw a neat sketch of dry dock (plan and section) and label all components, and explain the working principle of dry dock.
- d) Determine the turning radius of the taxiway for a supersonic transport aircraft with a wheel base of 30m and tread of main landing gear as 7.2 m for a design turning speed of 60kmph. Assume co-efficient of friction between tyre and pavement surface as 0.13 and width of taxiway pavement as 22.50m.

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Set **S**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Railway & Harbour Engineering**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The angle between the gauge faces of the stock rail and tongue rail is called?
  - a) Switch angle
  - b) Angle of crossing
  - c) Angle of turnout
  - d) None of these
- 2) Which one of the following types of steel is used in the manufacturing of metro and mono rails?
  - a) Mild Steel
  - b) Cast steel
  - c) Manganese Steel
  - d) Bessemer Steel
- 3) Match List-I (Signals) with List-II (Function) and select the correct answer using the code given below:

List-I		List-II	
A	Outer signal	1	Departure signal
B	Starter Signal	2	Reception signal
C	Repeater signal	3	Shunting signal
D	Disc signal	4	Co-acting signal

Codes:

- |    |   |   |   |   |
|----|---|---|---|---|
|    | A | B | C | D |
| a) | 3 | 4 | 1 | 2 |
| b) | 2 | 1 | 4 | 3 |
| c) | 3 | 1 | 4 | 2 |
| d) | 2 | 4 | 1 | 3 |
- 4) In type-II Windrose Diagram covers \_\_\_\_\_.
    - a) Direction and duration of Wind
    - b) Only Duration of Wind
    - c) Only Direction of Wind
    - d) Direction, duration and intensity of wind
  - 5) Which one of the following instance of performance of aircraft is not considered for determining basic runway length?
    - a) Normal Landing Case
    - b) Normal take-off case
    - c) Engine failure case
    - d) Emergency landing case

- 6) The runway length after correcting for elevation and temperature is 2845m. If the effective gradient on runway is 0.5%, then the revised runway length will be: \_\_\_\_\_.

a) 2845m	b) 2910m
c) 3030m	d) 3130m
- 7) The phenomenon of movement and deposition of sand in a zig-zag style due to drifting of sand in the vicinity of coast is called:

a) Littoral drift	b) Sedimentation
c) Beach drift	d) Trough action
- 8) \_\_\_\_\_ is a structure constructed at the tip of a breakwater near the harbour entrance.

a) Dolphin	b) Wharf
c) Pier heads	d) Jetties
- 9) Slip is the space of water area between two \_\_\_\_\_.

a) Adjacent fenders	b) Adjacent piers
c) Adjacent jetties	d) Adjacent dolphins
- 10) Once the head wore out during service, the rail could be inverted and reused. In which type of the rail this facility is available?

a) Double headed rail	
b) Bull Headed rail	
c) Flat footed rail	
d) Both Bull headed and Double headed rails	
- 11) For a sleeper density of  $(n+6)$ , number of sleepers required for constructing a Broad Gauge (BG) railway track of length 650m is: \_\_\_\_\_.

a) 975	b) 918
c) 950	d) 980
- 12) Bearing plates are used to fix \_\_\_\_\_.

a) Flat footed rails to the wooden sleepers	
b) Double headed rails to the wooden sleepers	
c) Bull headed rails to the wooden sleepers	
d) Flat footed rails to the cast iron sleepers	
- 13) The standard length of rail for Broad Gauge and Meter Gauge are respectively, \_\_\_\_\_.

a) 12m and 12m	b) 13m and 12m
c) 12m and 13m	d) 13m and 13m
- 14) Longitudinal movement of rails with respect to sleepers is called?

a) Coning of wheels	b) Creep of rails
c) Wear of rails	d) Tilting of rails

<b>Seat No.</b>	
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Railway & Harbour Engineering**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) In Section-I, Q. No. 2 is compulsory and solve any ONE full question from remaining questions Q. No. 3 and 4.  
 4) In Section-II, Q. No. 5 is compulsory and solve any full ONE full question from remaining questions Q. No. 6 and 7.

**Section – I**

**Q.2 Answer any two questions** **10**

- a) What do you understand by gauge? Mention the different gauges used on Indian Railways and its suitability.
- b) Discuss the necessity and effects of coning of wheels and tilting of rails.
- c) Draw a neat sketch of a left-hand-turn out and name its various components. Describe any one method of designing a turnout.

**Q.3 Answer any three questions** **18**

- a) Calculate the superelevation and the maximum permissible speed for a  $2^\circ$  BG transitioned curve on a high-speed route with a maximum sanctioned speed of 110 km/h. The speed for calculating the equilibrium superelevation as decided by the chief engineer is 80 km/h and the booked speed of goods trains is 50 km/h. Assume  $G=1750\text{mm}$  and  $\text{Radius}=875\text{m}$ .
- b) Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22tonne each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. Assume the coefficient of friction to be 0.2.
- c) If a  $8^\circ$  curve track diverges from a main curve of  $5^\circ$  in an opposite direction in the layout of B. G. Yard, calculate the super elevation and the speed on the branch line, if the maximum speed permitted on the main line is 45 kmph. Assume any data required suitably. Use 30m arc length.
- d) What is superelevation? Why is it necessary to provide superelevation on the curves of a railway track?

**Q.4 Answer any three questions** **18**

- a) What is meant by a crossing number and a crossing angle? How is crossing angle determined? Explain methods for the same.
- b) Differentiate between the following:
  - 1) Reception signals and departure signals
  - 2) Semaphore signal and warner signal
  - 3) Repeating signal and co-acting signal

- c) Illustrate the working principle of key interlocking and mechanical interlocking with merits and de-merits.
- d) Compare the various characteristics of steam, diesel and electric traction.

### Section – II

#### Q.5 Answer any two questions

10

- a) What are the imaginary surfaces? Explain any two imaginary surfaces with neat sketch.
- b) What is a wind rose diagram? What are its types and explain any one with neat sketch?
- c) What are the fenders? Why are they used? Describe various types of fenders with sketches.

#### Q.6 Answer any three questions

18

- a) Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is  $35^\circ$  and the maximum turn-off speed is 80 kmph. Assume radius of entrance curve = 731m, runway width = 45m, taxiway width = 22.5m. Draw a neat sketch showing all the design elements. Assume the separation clearance as 217.75m
- b) Define breakwater and list the different types of breakwaters. Explain any one with neat sketch.
- c) What are dolphins? Describe their types.
- d) Explain with neat sketches the limiting heights of objects in the approach and turning zone of an instrumental runway.

#### Q.7 Answer any three questions

18

- a) Explain how the basic runway length is determined on the basis of the performance characteristics of jet and conventional engine aircrafts.
- b) The length of a runway under standard conditions is 2100m. The airport is to be provided at elevation of 410m above the mean sea level. The airport reference temperature is  $32^\circ\text{C}$ . Determine the length of runway. Apply corrections for elevation and temperature as per ICAO and for gradient as per FAA specifications. The construction plan provides following data:

End to end of runway (m) 0-320	0 to 320	300 to 900	900 to 1500	1500 to 1800	1800 to 2100	2100 to 2700	2700 to 3000
Grade (%)	+1.00	-0.50	+0.50	+ 1.00	-0.50	-0.40	-0.10

- c) Draw a neat sketch of dry dock (plan and section) and label all components, and explain the working principle of dry dock.
- d) Determine the turning radius of the taxiway for a supersonic transport aircraft with a wheel base of 30m and tread of main landing gear as 7.2 m for a design turning speed of 60kmph. Assume co-efficient of friction between tyre and pavement surface as 0.13 and width of taxiway pavement as 22.50m.

**Seat  
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## Open Elective-III: Economic policies in India

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

### MCQ/Objective Type Questions

Marks: 14

14

- 1) LPG model of Deployment was introduced in \_\_\_\_\_.  
a) 1990                                      b) 1962  
c) 1991                                      d) none of these
- 2) Water seed fertilizer technology popularly known as \_\_\_\_\_.  
a) Growth development                  b) Green revolution  
c) Peasant reforms                        d) None of these
- 3) Consider the following statements:  
I) Bulk of employment is in rural areas.  
II) The disguised unemployment in agricultural sector is perennial  
III) Industrialisation rendered several people jobless in India  
Which of the statement given below is/are correct?  
a) I and II                                      b) I and III  
c) I, II and III                                d) None of these
- 4) The price level is the \_\_\_\_\_.  
a) weighted average price of all goods  
b) weighted average price of all goods and services  
c) weighted average price of all services  
d) weighted average price of exported goods and services
- 5) Which of the following is the best measure of how inflation affects consumers?  
a) The increase in the price of gold  
b) The increase in the consumer price index  
c) The increase in the price of a single product  
d) The decrease in the consumer price index
- 6) When rational consumers expect inflation to occur, they are more likely to \_\_\_\_\_.  
a) Buy expensive goods sooner  
b) Postpone the purchase of expensive goods.  
c) Hoard dollars  
d) Invest in newly issued fixed rate bonds that have not accounted for the expected inflation



- 7) Green Revolution resulted in significant increase of agricultural productivity due to \_\_\_\_\_.  
a) High yielding variety of grains  
b) Use of pesticides  
c) Improved management techniques  
d) All the three
- 8) The choice between high markups and high volume is part of which of the following retailer marketing decisions?  
a) Target market decisions  
b) Product assortment and services decisions  
c) Pricing decisions  
d) Promotion decisions
- 9) Technological advances, shifts in consumer tastes, and increased competition, all of which reduce demand for a product are typical of which stage in the PLC?  
a) decline stage  
b) introduction stage  
c) growth stage  
d) maturity stage
- 10) What particular market failure does the “market failure argument” against free trade refer to?  
a) Knowledge and technology spill-overs  
b) Unemployment  
c) Environmental externalities  
d) Any market failure that occurs in the tradable sector
- 11) Selling of state owned assets \_\_\_\_\_.  
a) Deregulation  
b) Privatisation  
c) Integration  
d) Nationalisation
- 12) The Keynesian theory of employment provides the solution of?  
a) Frictional unemployment  
b) Disguised unemployment  
c) Cyclical unemployment  
d) Seasonal unemployment
- 13) A nation's balance of trade is equal to its exports less its imports of \_\_\_\_\_.  
a) goods  
b) goods and services  
c) financial assets  
d) official reserves
- 14) If exchange rates float freely, the exchange rate for any currency is determined by the \_\_\_\_\_.  
a) demand for it  
b) supply of it  
c) demand for and the supply of it  
d) official reserves that back it

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Open Elective-III: Economic policies in India**

Day &amp; Date: Wednesday, 22-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5  
 2) Q. 6 is compulsory, attempt any two out of Q.7 to Q.9  
 3) Figures to the right indicate full marks

**Section – I**

- Q.2 Answer the following questions** **12**  
 a) Explain the term 'Economic Policy'.  
 b) Discuss the characteristics of Indian Economy.  
 c) Explain the Eleventh five year plan.
- Q.3 Answer the following questions** **08**  
 a) State the need and objectives of economic policy in India  
 b) What do you mean by national income? How it estimates?
- Q.4 Answer the following questions** **08**  
 a) Examine the basic demographic Features of India and their relevance for India economic policy for development.  
 b) What is the concept of Unemployment? Discuss.
- Q.5 Answer the following questions** **08**  
 a) What is the importance of agriculture in the Indian economy?  
 b) Explain the rural and agricultural marketing. Enlist the basic facilities needed for agricultural marketing.

**Section – II**

- Q.6 Answer the following questions** **12**  
 a) What is meant by industrialization? Discuss the role of industrialization.  
 b) Discuss the industrial sector in post-reform period.  
 c) Discuss the role of public sector.
- Q.7 Answer the following questions** **08**  
 a) Discuss the role of infrastructure in economic development.  
 b) Write a short note on the Monetary Policy of India.
- Q.8 Answer the following questions** **08**  
 a) Discuss status of foreign trade before Independence  
 b) Discuss the role of FDI.
- Q.9 Answer the following questions** **08**  
 a) Explain the fiscal federalism in India.  
 b) Explain the concept and features of Bureaucracy.

Seat No.	
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Set Q
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Open Elective-III: Economic policies in India**

Day & Date: Wednesday, 22-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The choice between high markups and high volume is part of which of the following retailer marketing decisions?
  - a) Target market decisions
  - b) Product assortment and services decisions
  - c) Pricing decisions
  - d) Promotion decisions
- 2) Technological advances, shifts in consumer tastes, and increased competition, all of which reduce demand for a product are typical of which stage in the PLC?
 

a) decline stage	b) introduction stage
c) growth stage	d) maturity stage
- 3) What particular market failure does the "market failure argument" against free trade refer to?
  - a) Knowledge and technology spill-overs
  - b) Unemployment
  - c) Environmental externalities
  - d) Any market failure that occurs in the tradable sector
- 4) Selling of state owned assets \_\_\_\_\_.
 

a) Deregulation	b) Privatisation
c) Integration	d) Nationalisation
- 5) The Keynesian theory of employment provides the solution of?
 

a) Frictional unemployment	b) Disguised unemployment
c) Cyclical unemployment	d) Seasonal unemployment
- 6) A nation's balance of trade is equal to its exports less its imports of \_\_\_\_\_.
 

a) goods	b) goods and services
c) financial assets	d) official reserves

- 7) If exchange rates float freely, the exchange rate for any currency is determined by the \_\_\_\_\_.  
a) demand for it  
b) supply of it  
c) demand for and the supply of it  
d) official reserves that back it
- 8) LPG model of Deployment was introduced in \_\_\_\_\_.  
a) 1990  
b) 1962  
c) 1991  
d) none of these
- 9) Water seed fertilizer technology popularly known as \_\_\_\_\_.  
a) Growth development  
b) Green revolution  
c) Peasant reforms  
d) None of these
- 10) Consider the following statements:  
I) Bulk of employment is in rural areas.  
II) The disguised unemployment in agricultural sector is perennial  
III) Industrialisation rendered several people jobless in India  
Which of the statement given below is/are correct?  
a) I and II  
b) I and III  
c) I, II and III  
d) None of these
- 11) The price level is the \_\_\_\_\_.  
a) weighted average price of all goods  
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d) weighted average price of exported goods and services
- 12) Which of the following is the best measure of how inflation affects consumers?  
a) The increase in the price of gold  
b) The increase in the consumer price index  
c) The increase in the price of a single product  
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- 13) When rational consumers expect inflation to occur, they are more likely to \_\_\_\_\_.  
a) Buy expensive goods sooner  
b) Postpone the purchase of expensive goods.  
c) Hoard dollars  
d) Invest in newly issued fixed rate bonds that have not accounted for the expected inflation
- 14) Green Revolution resulted in significant increase of agricultural productivity due to \_\_\_\_\_.  
a) High yielding variety of grains  
b) Use of pesticides  
c) Improved management techniques  
d) All the three

Seat No.	
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Set Q
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Open Elective-III: Economic policies in India**

Day & Date: Wednesday, 22-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5  
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**Section – I**

- Q.2 Answer the following questions** **12**  
a) Explain the term 'Economic Policy'.  
b) Discuss the characteristics of Indian Economy.  
c) Explain the Eleventh five year plan.
- Q.3 Answer the following questions** **08**  
a) State the need and objectives of economic policy in India  
b) What do you mean by national income? How it estimates?
- Q.4 Answer the following questions** **08**  
a) Examine the basic demographic Features of India and their relevance for India economic policy for development.  
b) What is the concept of Unemployment? Discuss.
- Q.5 Answer the following questions** **08**  
a) What is the importance of agriculture in the Indian economy?  
b) Explain the rural and agricultural marketing. Enlist the basic facilities needed for agricultural marketing.

**Section – II**

- Q.6 Answer the following questions** **12**  
a) What is meant by industrialization? Discuss the role of industrialization.  
b) Discuss the industrial sector in post-reform period.  
c) Discuss the role of public sector.
- Q.7 Answer the following questions** **08**  
a) Discuss the role of infrastructure in economic development.  
b) Write a short note on the Monetary Policy of India.
- Q.8 Answer the following questions** **08**  
a) Discuss status of foreign trade before Independence  
b) Discuss the role of FDI.
- Q.9 Answer the following questions** **08**  
a) Explain the fiscal federalism in India.  
b) Explain the concept and features of Bureaucracy.

<b>Seat No.</b>	
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## Open Elective-III: Economic policies in India

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

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3) Figures to the right indicates full marks

Marks: 14

14

- Choose the correct alternatives from the options:
- 1) Selling of state owned assets \_\_\_\_\_.  
a) Deregulation  
b) Privatisation  
c) Integration  
d) Nationalisation
  - 2) The Keynesian theory of employment provides the solution of?  
a) Frictional unemployment  
b) Disguised unemployment  
c) Cyclical unemployment  
d) Seasonal unemployment
  - 3) A nation's balance of trade is equal to its exports less its imports of \_\_\_\_\_.  
a) goods  
b) goods and services  
c) financial assets  
d) official reserves
  - 4) If exchange rates float freely, the exchange rate for any currency is determined by the \_\_\_\_\_.  
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b) supply of it  
c) demand for and the supply of it  
d) official reserves that back it
  - 5) LPG model of Deployment was introduced in \_\_\_\_\_.  
a) 1990  
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d) none of these
  - 6) Water seed fertilizer technology popularly known as \_\_\_\_\_.  
a) Growth development  
b) Green revolution  
c) Peasant reforms  
d) None of these
  - 7) Consider the following statements:  
I) Bulk of employment is in rural areas.  
II) The disguised unemployment in agricultural sector is perennial  
III) Industrialisation rendered several people jobless in India  
Which of the statement given below is/are correct?  
a) I and II  
b) I and III  
c) I, II and III  
d) None of these

- 8) The price level is the \_\_\_\_\_.  
a) weighted average price of all goods  
b) weighted average price of all goods and services  
c) weighted average price of all services  
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- 9) Which of the following is the best measure of how inflation affects consumers?  
a) The increase in the price of gold  
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c) The increase in the price of a single product  
d) The decrease in the consumer price index
- 10) When rational consumers expect inflation to occur, they are more likely to \_\_\_\_\_.  
a) Buy expensive goods sooner  
b) Postpone the purchase of expensive goods.  
c) Hoard dollars  
d) Invest in newly issued fixed rate bonds that have not accounted for the expected inflation
- 11) Green Revolution resulted in significant increase of agricultural productivity due to \_\_\_\_\_.  
a) High yielding variety of grains  
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- 12) The choice between high markups and high volume is part of which of the following retailer marketing decisions?  
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c) Pricing decisions  
d) Promotion decisions
- 13) Technological advances, shifts in consumer tastes, and increased competition, all of which reduce demand for a product are typical of which stage in the PLC?  
a) decline stage  
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c) growth stage  
d) maturity stage
- 14) What particular market failure does the “market failure argument” against free trade refer to?  
a) Knowledge and technology spill-overs  
b) Unemployment  
c) Environmental externalities  
d) Any market failure that occurs in the tradable sector

<b>Seat No.</b>	
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022****CIVIL ENGINEERING****Open Elective-III: Economic policies in India**

Day &amp; Date: Wednesday, 22-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5  
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**Section – I**

- Q.2 Answer the following questions** **12**  
 a) Explain the term 'Economic Policy'.  
 b) Discuss the characteristics of Indian Economy.  
 c) Explain the Eleventh five year plan.
- Q.3 Answer the following questions** **08**  
 a) State the need and objectives of economic policy in India  
 b) What do you mean by national income? How it estimates?
- Q.4 Answer the following questions** **08**  
 a) Examine the basic demographic Features of India and their relevance for India economic policy for development.  
 b) What is the concept of Unemployment? Discuss.
- Q.5 Answer the following questions** **08**  
 a) What is the importance of agriculture in the Indian economy?  
 b) Explain the rural and agricultural marketing. Enlist the basic facilities needed for agricultural marketing.

**Section – II**

- Q.6 Answer the following questions** **12**  
 a) What is meant by industrialization? Discuss the role of industrialization.  
 b) Discuss the industrial sector in post-reform period.  
 c) Discuss the role of public sector.
- Q.7 Answer the following questions** **08**  
 a) Discuss the role of infrastructure in economic development.  
 b) Write a short note on the Monetary Policy of India.
- Q.8 Answer the following questions** **08**  
 a) Discuss status of foreign trade before Independence  
 b) Discuss the role of FDI.
- Q.9 Answer the following questions** **08**  
 a) Explain the fiscal federalism in India.  
 b) Explain the concept and features of Bureaucracy.



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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Open Elective-III: Economic policies in India**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) When rational consumers expect inflation to occur, they are more likely to \_\_\_\_\_.  
 a) Buy expensive goods sooner  
 b) Postpone the purchase of expensive goods.  
 c) Hoard dollars  
 d) Invest in newly issued fixed rate bonds that have not accounted for the expected inflation
- 2) Green Revolution resulted in significant increase of agricultural productivity due to \_\_\_\_\_.  
 a) High yielding variety of grains  
 b) Use of pesticides  
 c) Improved management techniques  
 d) All the three
- 3) The choice between high markups and high volume is part of which of the following retailer marketing decisions?  
 a) Target market decisions  
 b) Product assortment and services decisions  
 c) Pricing decisions  
 d) Promotion decisions
- 4) Technological advances, shifts in consumer tastes, and increased competition, all of which reduce demand for a product are typical of which stage in the PLC?  
 a) decline stage  
 b) introduction stage  
 c) growth stage  
 d) maturity stage
- 5) What particular market failure does the "market failure argument" against free trade refer to?  
 a) Knowledge and technology spill-overs  
 b) Unemployment  
 c) Environmental externalities  
 d) Any market failure that occurs in the tradable sector

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Open Elective-III: Economic policies in India**

Day & Date: Wednesday, 22-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5  
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**Section – I**

- Q.2 Answer the following questions** **12**  
 a) Explain the term 'Economic Policy'.  
 b) Discuss the characteristics of Indian Economy.  
 c) Explain the Eleventh five year plan.
- Q.3 Answer the following questions** **08**  
 a) State the need and objectives of economic policy in India  
 b) What do you mean by national income? How it estimates?
- Q.4 Answer the following questions** **08**  
 a) Examine the basic demographic Features of India and their relevance for India economic policy for development.  
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- Q.5 Answer the following questions** **08**  
 a) What is the importance of agriculture in the Indian economy?  
 b) Explain the rural and agricultural marketing. Enlist the basic facilities needed for agricultural marketing.

**Section – II**

- Q.6 Answer the following questions** **12**  
 a) What is meant by industrialization? Discuss the role of industrialization.  
 b) Discuss the industrial sector in post-reform period.  
 c) Discuss the role of public sector.
- Q.7 Answer the following questions** **08**  
 a) Discuss the role of infrastructure in economic development.  
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- Q.9 Answer the following questions** **08**  
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Seat No.	
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Set **P**

**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Practice, Law and Ethics**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 70

Time: 02:00 PM To 5:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A contract consist of
  - a) Mutual promises or agreement enforceable by law
  - b) Agreement not enforceable by law
  - c) Involuntary obligations
  - d) None of these
- 2) The correct sequence in the formation of a contract is
  - a) Offer, acceptance, agreement, consideration
  - b) Agreement, consideration, Offer, acceptance,
  - c) Offer, consideration, acceptance, agreement
  - d) Offer, acceptance, consideration, agreement
- 3) Profession Means
  - a) Any paid occupation, job and career
  - b) Specialized person in his job area
  - c) Any way of serving livelihood
  - d) None of these
- 4) Which of the following matter are not referred to arbitration?
 

a) Civil matters	b) Matrimonial matters
c) Banking matters	d) Property matters
- 5) Industrial acts are useful for
  - a) guarantee of employee welfare
  - b) provision of legal platform
  - c) removes extortion of workers
  - d) All of these
- 6) Workmans compensation act consist of which of following provisions of act
 

a) Partial disablement	b) Total disablement
c) Amount of compensation	d) All of these
- 7) Safety provisions in Indian Factory Act does not cover
 

a) Fencing of machinery	b) Precaution against fire
c) Lunch rooms	d) Protection eyes



Seat No.	
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Set

P

**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Practice, Law and Ethics**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 02:00 PM To 5:00 PM

**Instructions:** 1) Q.2 is compulsory. Solve any two out of Q.3 to Q.5.  
 2) Q.6 is compulsory. Solve any two out of Q.6 to Q.9.

**Section – I**

- Q.2 Answer the following:** **12**  
 a) Compare Professional Ethics and Business Ethics  
 b) What is Code of Conduct for Professionals?  
 c) Explain conflict of interest with suitable example.
- Q.3 Explain** **08**  
 a) Role governed by RERA for Builders and Developers.  
 b) Role of Institution of Engineers (India) as stakeholder.
- Q.4 Explain** **08**  
 a) Offer and acceptance as per Indian Contract act  
 b) Essentials of Valid contract
- Q.5 Explain** **08**  
 a) Whistleblowing  
 b) Gift and Bribe

**Section – II**

- Q.6 Write detailed notes on:** **12**  
 a) Arbitration  
 b) Conciliation  
 c) Basic types of Dispute Resolution
- Q.7 Explain:** **08**  
 a) Features of 'LOK ADALAT'  
 b) Contract labour
- Q.8 Explain:** **08**  
 a) Industrial Dispute Act  
 b) Workmen's Compensation Act
- Q.9 Answer following questions.** **08**  
 a) Compare Patent. Trademark and Copyright  
 b) Write note on 'RERA Act 2017'

<b>Seat No.</b>	
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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Professional Practice, Law and Ethics**

Day & Date: Friday, 24-02-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What protects the intellectual property created by artists
 

a) Copyright	b) Patents
c) Registered Designs	d) Trademarks
  
- 2) Which among the following form a type on intellectual property?
 

i) Trade secret	
ii) Digital signature	
iii) Trademarks	
iv) Copyrights	
a) 1,2,3 and 4	b) 1,3 and 4
c) 3 and 4	d) 2,3 and 4
  
- 3) What does a trademark protect?
 

a) Invention	b) Work of art
c) Logo	d) Secret formula
  
- 4) Which among following is not a provision in Indian Factory act
 

a) Health	b) Welfare
c) Minimum Wages	d) Safety
  
- 5) Which is similarity in Mediation and Conciliation?
 

a) They should be same	b) They both use a messenger
c) They are same	d) There isn't any similarity
  
- 6) Lok Adalat means
 

a) Women's court	b) Men's court
c) people's court	d) Children court
  
- 7) The first and farthest professional ethics is
 

a) To strive for excellence
b) To take care to environment
c) To serve the needy and poor of the society
d) None of these

- 8) A contract consist of
- a) Mutual promises or agreement enforceable by law
  - b) Agreement not enforceable by law
  - c) Involuntary obligations
  - d) None of these
- 9) The correct sequence in the formation of a contract is
- a) Offer, acceptance, agreement, consideration
  - b) Agreement, consideration, Offer, acceptance,
  - c) Offer, consideration, acceptance, agreement
  - d) Offer, acceptance, consideration, agreement
- 10) Profession Means
- a) Any paid occupation, job and career
  - b) Specialized person in his job area
  - c) Any way of serving livelihood
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- 11) Which of the following matter are not referred to arbitration?
- a) Civil matters
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- 12) Industrial acts are useful for
- a) guarantee of employee welfare
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- 13) Workmans compensation act consist of which of following provisions of act
- a) Partial disablement
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- a) Fencing of machinery
  - b) Precaution against fire
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  - d) Protection eyes



<b>Seat No.</b>	
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**Set Q**

**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Practice, Law and Ethics**

Day & Date: Friday, 24-02-2023  
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Max. Marks: 56

**Instructions:** 1) Q.2 is compulsory. Solve any two out of Q.3 to Q.5.  
 2) Q.6 is compulsory. Solve any two out of Q.6 to Q.9.

**Section – I**

- Q.2 Answer the following:** **12**  
 a) Compare Professional Ethics and Business Ethics  
 b) What is Code of Conduct for Professionals?  
 c) Explain conflict of interest with suitable example.
- Q.3 Explain** **08**  
 a) Role governed by RERA for Builders and Developers.  
 b) Role of Institution of Engineers (India) as stakeholder.
- Q.4 Explain** **08**  
 a) Offer and acceptance as per Indian Contract act  
 b) Essentials of Valid contract
- Q.5 Explain** **08**  
 a) Whistleblowing  
 b) Gift and Bribe

**Section – II**

- Q.6 Write detailed notes on:** **12**  
 a) Arbitration  
 b) Conciliation  
 c) Basic types of Dispute Resolution
- Q.7 Explain:** **08**  
 a) Features of 'LOK ADALAT'  
 b) Contract labour
- Q.8 Explain:** **08**  
 a) Industrial Dispute Act  
 b) Workmen's Compensation Act
- Q.9 Answer following questions.** **08**  
 a) Compare Patent. Trademark and Copyright  
 b) Write note on 'RERA Act 2017'

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Practice, Law and Ethics**

Day & Date: Friday, 24-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which among following is not a provision in Indian Factory act
  - a) Health
  - b) Welfare
  - c) Minimum Wages
  - d) Safety
- 2) Which is similarity in Mediation and Conciliation?
  - a) They should be same
  - b) They both use a messenger
  - c) They are same
  - d) There isn't any similarity
- 3) Lok Adalat means
  - a) Women's court
  - b) Men's court
  - c) people's court
  - d) Children court
- 4) The first and farthest professional ethics is
  - a) To strive for excellence
  - b) To take care to environment
  - c) To serve the needy and poor of the society
  - d) None of these
- 5) A contract consist of
  - a) Mutual promises or agreement enforceable by law
  - b) Agreement not enforceable by law
  - c) Involuntary obligations
  - d) None of these
- 6) The correct sequence in the formation of a contract is
  - a) Offer, acceptance, agreement, consideration
  - b) Agreement, consideration, Offer, acceptance,
  - c) Offer, consideration, acceptance, agreement
  - d) Offer, acceptance, consideration, agreement
- 7) Profession Means
  - a) Any paid occupation, job and career
  - b) Specialized person in his job area
  - c) Any way of serving livelihood
  - d) None of these

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<b>Seat No.</b>	
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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Practice, Law and Ethics**

Day & Date: Friday, 24-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) Q.2 is compulsory. Solve any two out of Q.3 to Q.5.  
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**Section – I**

- Q.2 Answer the following:** **12**  
 a) Compare Professional Ethics and Business Ethics  
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**Section – II**

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 b) Contract labour
- Q.8 Explain:** **08**  
 a) Industrial Dispute Act  
 b) Workmen's Compensation Act
- Q.9 Answer following questions.** **08**  
 a) Compare Patent. Trademark and Copyright  
 b) Write note on 'RERA Act 2017'

Seat No.	
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Set **S**

**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Practice, Law and Ethics**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 70

Time: 02:00 PM To 5:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Workmans compensation act consist of which of following provisions of act
  - a) Partial disablement
  - b) Total disablement
  - c) Amount of compensation
  - d) All of these
- 2) Safety provisions in Indian Factory Act does not cover
  - a) Fencing of machinery
  - b) Precaution against fire
  - c) Lunch rooms
  - d) Protection eyes
- 3) What protects the intellectual property created by artists
  - a) Copyright
  - b) Patents
  - c) Registered Designs
  - d) Trademarks
- 4) Which among the following form a type on intellectual property?
  - i) Trade secret
  - ii) Digital signature
  - iii) Trademarks
  - iv) Copyrights
  - a) 1,2,3 and 4
  - b) 1,3 and 4
  - c) 3 and 4
  - d) 2,3 and 4
- 5) What does a trademark protect?
  - a) Invention
  - b) Work of art
  - c) Logo
  - d) Secret formula
- 6) Which among following is not a provision in Indian Factory act
  - a) Health
  - b) Welfare
  - c) Minimum Wages
  - d) Safety
- 7) Which is similarity in Mediation and Conciliation?
  - a) They should be same
  - b) They both use a messenger
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  - d) There isn't any similarity
- 8) Lok Adalat means
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  - b) Men's court
  - c) people's court
  - d) Children court

- 9)** The first and farthest professional ethics is
- a) To strive for excellence
  - b) To take care to environment
  - c) To serve the needy and poor of the society
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- a) Mutual promises or agreement enforceable by law
  - b) Agreement not enforceable by law
  - c) Involuntary obligations
  - d) None of these
- 11)** The correct sequence in the formation of a contract is
- a) Offer, acceptance, agreement, consideration
  - b) Agreement, consideration, Offer, acceptance,
  - c) Offer, consideration, acceptance, agreement
  - d) Offer, acceptance, consideration, agreement
- 12)** Profession Means
- a) Any paid occupation, job and career
  - b) Specialized person in his job area
  - c) Any way of serving livelihood
  - d) None of these
- 13)** Which of the following matter are not referred to arbitration?
- a) Civil matters
  - b) Matrimonial matters
  - c) Banking matters
  - d) Property matters
- 14)** Industrial acts are useful for
- a) guarantee of employee welfare
  - b) provision of legal platform
  - c) removes extortion of workers
  - d) All of these

<b>Seat No.</b>	
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**Set S**

**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Professional Practice, Law and Ethics**

Day & Date: Friday, 24-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) Q.2 is compulsory. Solve any two out of Q.3 to Q.5.  
2) Q.6 is compulsory. Solve any two out of Q.6 to Q.9.

**Section – I**

- Q.2 Answer the following:** **12**  
a) Compare Professional Ethics and Business Ethics  
b) What is Code of Conduct for Professionals?  
c) Explain conflict of interest with suitable example.
- Q.3 Explain** **08**  
a) Role governed by RERA for Builders and Developers.  
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- Q.4 Explain** **08**  
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- Q.5 Explain** **08**  
a) Whistleblowing  
b) Gift and Bribe

**Section – II**

- Q.6 Write detailed notes on:** **12**  
a) Arbitration  
b) Conciliation  
c) Basic types of Dispute Resolution
- Q.7 Explain:** **08**  
a) Features of 'LOK ADALAT'  
b) Contract labour
- Q.8 Explain:** **08**  
a) Industrial Dispute Act  
b) Workmen's Compensation Act
- Q.9 Answer following questions.** **08**  
a) Compare Patent. Trademark and Copyright  
b) Write note on 'RERA Act 2017'

Seat No.	
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Set P
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MACHANICAL ENGINEERING**  
**Design of Machine Elements**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Answer cannot be changed once it is marked.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The first step in machine design procedure is \_\_\_\_\_.  
 a) Mechanism selection                      b) layout preparation  
 c) market survey                              d) Design of various parts
- 2) In case of repeated load which of the following is correct?  
 a)  $\sigma_m = 0$                                       b)  $\sigma_{min} = 0$   
 c)  $\sigma_{max} = 0$                                       d)  $\sigma_a = 0$
- 3) Factor of Safety is the ratio of \_\_\_\_\_.  
 a) working stress to failure stress  
 b) working load to failure load  
 c) impact load to static load  
 d) failure stress to working stress
- 4) Rankine's theory is preferred to design for \_\_\_\_\_.  
 a) ductile materials                              b) composite materials  
 c) brittle materials                                d) any material
- 5) Maximum shear stress in a shaft subjected to torsional and bending moments is given by \_\_\_\_\_.  
 a)  $16/\pi d^3 [(M_b)^2 + (M_t)^2]^{1/2}$   
 b)  $16/\pi d^3 [M_b + \{(M_b)^2 + (M_t)^2\}^{1/2}]$   
 c)  $16/\pi d^3 [M_t + \{(M_b)^2 + (M_t)^2\}^{1/2}]$   
 d)  $32/\pi d^3 [(M_b)^2 + (M_t)^2]^{1/2}$
- 6) The width & height of a square key are usually taken as \_\_\_\_\_.  
 a) d    b) d/6  
 c) d/8     d) d/4
- 7) The simplest type of couplings is \_\_\_\_\_.  
 a) clamp coupling                                b) muff coupling  
 c) flanged coupling                               d) flexible coupling



- 8) Wahl factor in spring design is given by \_\_\_\_\_.  
 a)  $4C - 4 / (4C - 1) + 0.615 / C$   
 b)  $4C - 1 / (4C - 4) + 0.615 / C$   
 c)  $3C - 4 / (3C - 1) + 0.615 / C$   
 d)  $3C - 1 / (3C - 4) + 0.615 / C$
- 9) For two springs connected in parallel, the combined stiffness is given by \_\_\_\_\_.  
 a)  $k_1 + k_2$   
 b)  $k_1 k_2$   
 c)  $k_1 k_2 / (k_1 + k_2)$   
 d)  $(k_1 + k_2) / k_1 k_2$
- 10) Stress concentration factor  $K_t$  with usual notations is given by,  
 a)  $\sigma_{max} / \sigma_{min}$   
 b)  $\sigma_o / \sigma_{max}$   
 c)  $\sigma_{min} / \sigma_{max}$   
 d)  $\sigma_{max} / \sigma_o$
- 11) Notch sensitivity  $q$  in terms of fatigue stress concentration factor  $K_f$  and theoretical stress stress concentration factor  $K_t$  is given by \_\_\_\_\_.  
 a)  $(K_f - 1) / (K_t - 1)$   
 b)  $(K_t - 1) / (K_f - 1)$   
 c)  $K_f / K_t$   
 d)  $K_t / K_f$
- 12) The optimum velocity for Dunlop flat belts is approximately \_\_\_\_\_.  
 a) 5 m/s  
 b) 18 m/s  
 c) 50 m/s  
 d) 30 m/s
- 13) Throat of a weld  $t$  in terms of the leg length  $h$  is given by \_\_\_\_\_.  
 a)  $1.414h$   
 b)  $0.5h$   
 c)  $2h$   
 d)  $0.707h$
- 14) If the bolts are subjected to an eccentric load with the bolt axes perpendicular to the plane of line of application of load, every bolt will be subjected to \_\_\_\_\_.  
 a) primary & secondary shear forces  
 b) primary shear force & tensile force  
 c) primary shear force & compressive force  
 d) tensile force & secondary shear force

Seat No.	
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Set **P**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MACHANICAL ENGINEERING**  
**Design of Machine Elements**

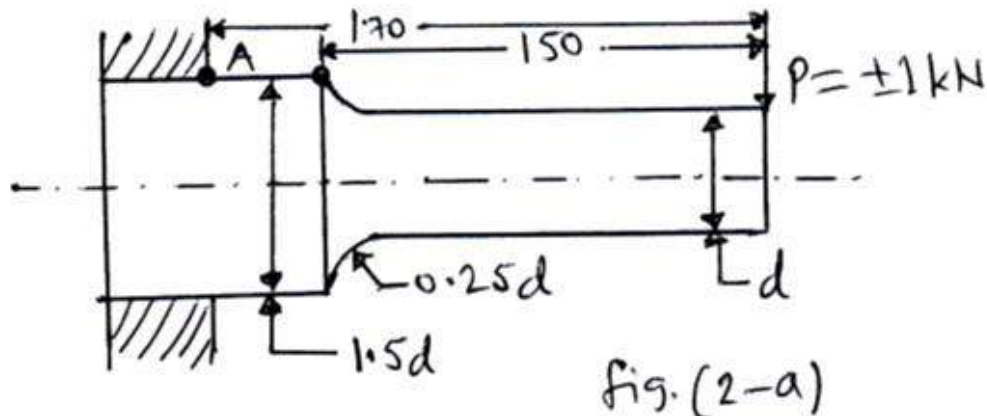
Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks.  
 4) Assume additional suitable data if necessary and state it clearly.  
 5) Draw the neat diagrams wherever required.

**Section – I**

- Q.2 a)** A cantilever beam made of cold drawn steel 20C8 ( $S_{ut} = 540 \text{ N/mm}^2$ ) is subjected to a completely reversed load of 1 kN as shown in fig. (2 - a). The notch sensitivity factor  $q$  at the fillet can be taken as 0.85. Take,  $K_a$  = surface finish factor = 0.78,  $K_b$  = size factor = 0.85,  $K_c$  = reliability factor = 0.897,  $K_t$  = stress concentration factor = 1.35. Determine the diameter of the beam for a life of 10000 cycles. **08**



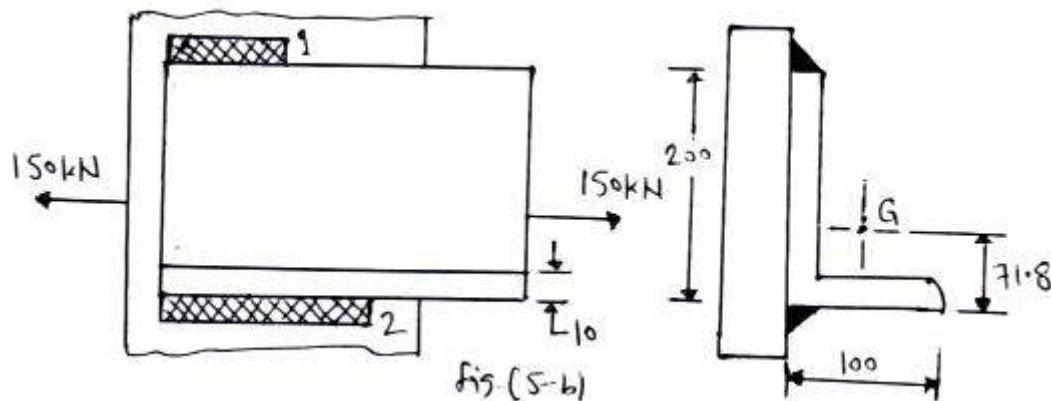
- b)** Explain with a block diagram the basic procedure of design of a machine element. **06**

- Q.3 a)** Two rods, required to withstand a tensile force of 30 kN, are connected by a knuckle joint. The rods and the pin are made of plain carbon steel 40C8 ( $S_{yt} = 380 \text{ N/mm}^2$ ). The factor of safety is 6. Calculate, **08**  
 i) The diameter of rods  
 ii) The diameter of the knuckle pin on the basis of bending failure.  
 Assume thickness of fork as 75 % of the rod diameter and thickness of eye as 125 % of the rod diameter.
- b)** What do you mean by stress concentration? Explain the causes of stress concentration in a component. **06**

- Q.4 a)** It is required to select a flat belt drive for a compressor running at 720 rpm driven by a 25 kW, 1440 rpm motor. The space is available for a centre distance of 3 m. The belt is open type. Assume a belt velocity of 18 m/s. The reference belt velocity may be taken as 5.08 m/s. Refer the data provided for flat belts. **08**
- b)** Discuss distortion energy theory of failure. State the important equations. **06**

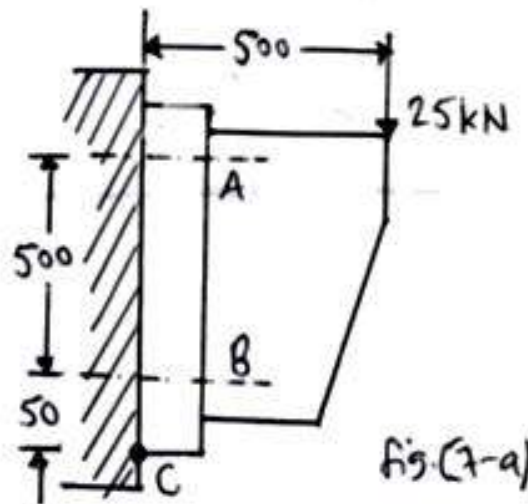
### Section – II

- Q.5 a)** A transmission shaft is supported on two bearings 1m apart. Power is supplied by a coupling located to the left of left hand bearing. Power is transmitted from the shaft by means of a belt pulley, 250 mm diameter, located at 300 mm from the left hand bearing. The mass of the pulley is 20 kg and the ratio of belt tensions on slack & tight sides is 2:1. The belt tensions act vertically downward. The shaft is made of steel F<sub>e</sub>E300 ( $S_{yt} = 300 \text{ N/mm}^2$ ) and the factor of safety is 3. Determine the shaft diameter if it transmits 10 kW power at 360 rpm. **08**
- b)** An ISA (200 x 100 x 10) mm angle is welded to a steel plate by fillet welds as shown in fig. (5-b). The angle is subjected to a static force of 150 kN and the permissible shear stress for the weld is 70 N/mm<sup>2</sup>. Determine the lengths of weld at the top and bottom. **06**



- Q.6 a)** A helical compression spring made of a circular wire is subjected to an axial force varying from 1000 N to 2000 N. Over this range of force, the deflection should be approximately 5 mm. The spring index is 5. The spring is made of steel wire of Grade 1 ( $G = 81370 \text{ N/mm}^2$ ). The constants A & m are 1753 and 0.182 respectively. The permissible shear stress for the spring wire is 50% of the ultimate tensile strength. Design for this spring the following. **08**
- wire diameter
  - mean coil diameter
  - number of active coils
- b)** The standard cross section for a flat key fitted on a 50 mm diameter shaft is (16 x 10) mm. The key is transmitting 475 N-m torque from the shaft to the hub. The key is made of steel ( $S_{yt} = S_{yc} = 230 \text{ N/mm}^2$ ). Determine the length of the key if the factor of safety is 3. **06**

- Q.7 a)** A wall bracket is attached to a wall by means of four identical bolts, two at A and two at B as shown in fig. (7-a). Assuming that the bracket is held against the wall and prevented from tipping about point C by all four bolts and using an allowable tensile stress in the bolts as  $35 \text{ N/mm}^2$ , determine the size of the bolts on the basis of maximum principal stress theory. **08**



- b)** Determine the expression to calculate the combined stiffness for the two helical springs connected in **06**
- series and
  - parallel

### Data for selection of Flat Belts

- Preferred diameters (in mm) of cast iron and mild steel pulleys are as below.  
100, 112, 125, 140, 160, 180, 200, 224, 250, 280, 315, 355, 400, 450, 500, 560, 630, 710, 800, 900, 1100
- Table for Load Correction Factor ( $F_a$ ):

Type of load	$F_a$
i) Normal load	1.0
ii) Steady load e.g. centrifugal pumps, fans light machine tools, conveyors	1.2
iii) International load e.g. heavy duty fans, blowers, compressors, reciprocating pumps, line shaft, heavy duty machines	1.3
iv) Shock load e.g. vacuum pumps, rolling mills, hammers, grinders	1.5

- Table for Arc of Contact Factor ( $F_d$ ):

$\alpha_s$ (Degrees)	120	130	140	150	160	170	180	190	200
$F_d$	1.33	1.26	1.19	1.13	1.08	1.04	1.00	0.97	0.94

- Power transmitting capacities of belts:  
HI-SPEED: 0.0118 kW per mm width per ply  
FORT: 0.0147 kW per mm width per ply

**5) Table for standard widths of belts (in mm):**

3-Ply	25	40	50	63	76					
4-Ply	40	44	50	63	76	90	100	112	125	152
5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

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Set Q
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MACHANICAL ENGINEERING**  
**Design of Machine Elements**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Wahl factor in spring design is given by \_\_\_\_\_.  
 a)  $4C - 4 / (4C - 1) + 0.615 / C$   
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- 4) Notch sensitivity q in terms of fatigue stress concentration factor  $K_f$  and theoretical stress stress concentration factor  $K_t$  is given by \_\_\_\_\_.  
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- 7) If the bolts are subjected to an eccentric load with the bolt axes perpendicular to the plane of line of application of load, every bolt will be subjected to \_\_\_\_\_.  
 a) primary & secondary shear forces  
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- 8) The first step in machine design procedure is \_\_\_\_\_.  
a) Mechanism selection                      b) layout preparation  
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- 9) In case of repeated load which of the following is correct?  
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b) working load to failure load  
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a) ductile materials                              b) composite materials  
c) brittle materials                                d) any material
- 12) Maximum shear stress in a shaft subjected to torsional and bending moments is given by \_\_\_\_\_.  
a)  $16/\pi d^3 [(M_b)^2 + (M_t)^2]^{1/2}$   
b)  $16/\pi d^3 [M_b + \{(M_b)^2 + (M_t)^2\}^{1/2}]$   
c)  $16/\pi d^3 [M_t + \{(M_b)^2 + (M_t)^2\}^{1/2}]$   
d)  $32/\pi d^3 [(M_b)^2 + (M_t)^2]^{1/2}$
- 13) The width & height of a square key are usually taken as \_\_\_\_\_.  
a) d    b) d/6  
c) d/8     d) d/4
- 14) The simplest type of couplings is \_\_\_\_\_.  
a) clamp coupling                                b) muff coupling  
c) flanged coupling                               d) flexible coupling

Seat No.	
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Set **Q**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MACHANICAL ENGINEERING**  
**Design of Machine Elements**

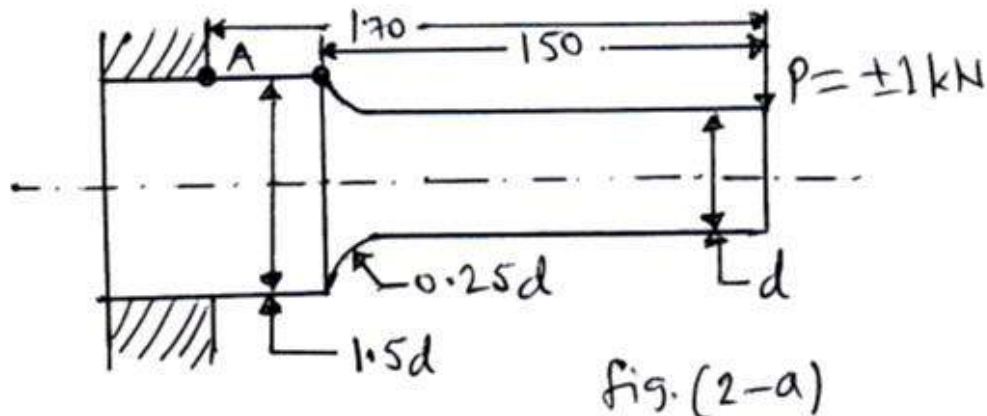
Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks.  
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**Section – I**

- Q.2 a)** A cantilever beam made of cold drawn steel 20C8 ( $S_{ut} = 540 \text{ N/mm}^2$ ) is subjected to a completely reversed load of 1 kN as shown in fig. (2 - a). The notch sensitivity factor  $q$  at the fillet can be taken as 0.85. Take,  $K_a$  = surface finish factor = 0.78,  $K_b$  = size factor = 0.85,  $K_c$  = reliability factor = 0.897,  $K_t$  = stress concentration factor = 1.35. Determine the diameter of the beam for a life of 10000 cycles. **08**



- b)** Explain with a block diagram the basic procedure of design of a machine element. **06**

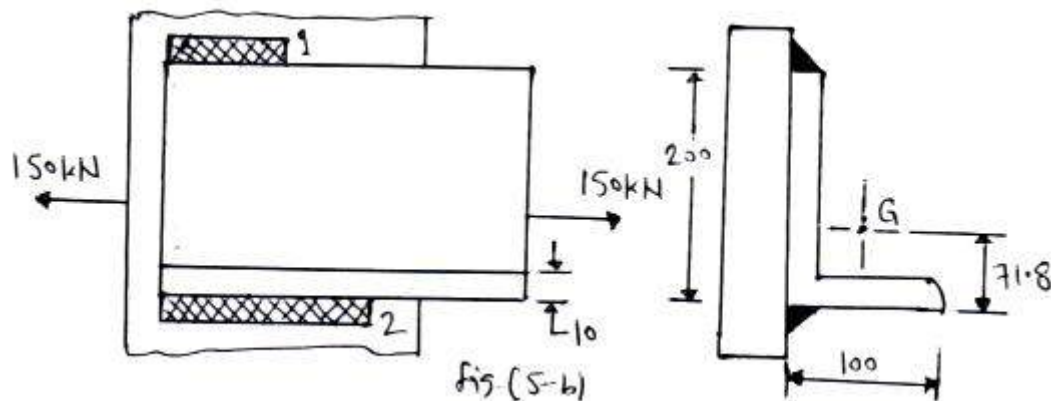
- Q.3 a)** Two rods, required to withstand a tensile force of 30 kN, are connected by a knuckle joint. The rods and the pin are made of plain carbon steel 40C8 ( $S_{yt} = 380 \text{ N/mm}^2$ ). The factor of safety is 6. Calculate, **08**  
 i) The diameter of rods  
 ii) The diameter of the knuckle pin on the basis of bending failure.  
 Assume thickness of fork as 75 % of the rod diameter and thickness of eye as 125 % of the rod diameter.
- b)** What do you mean by stress concentration? Explain the causes of stress concentration in a component. **06**



- Q.4 a)** It is required to select a flat belt drive for a compressor running at 720 rpm driven by a 25 kW, 1440 rpm motor. The space is available for a centre distance of 3 m. The belt is open type. Assume a belt velocity of 18 m/s. The reference belt velocity may be taken as 5.08 m/s. Refer the data provided for flat belts. **08**
- b)** Discuss distortion energy theory of failure. State the important equations. **06**

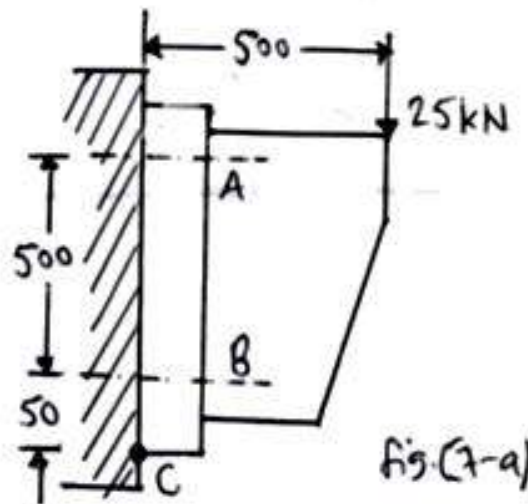
### Section – II

- Q.5 a)** A transmission shaft is supported on two bearings 1m apart. Power is supplied by a coupling located to the left of left hand bearing. Power is transmitted from the shaft by means of a belt pulley, 250 mm diameter, located at 300 mm from the left hand bearing. The mass of the pulley is 20 kg and the ratio of belt tensions on slack & tight sides is 2:1. The belt tensions act vertically downward. The shaft is made of steel F<sub>e</sub>E300 ( $S_{yt} = 300 \text{ N/mm}^2$ ) and the factor of safety is 3. Determine the shaft diameter if it transmits 10 kW power at 360 rpm. **08**
- b)** An ISA (200 x 100 x 10) mm angle is welded to a steel plate by fillet welds as shown in fig. (5-b). The angle is subjected to a static force of 150 kN and the permissible shear stress for the weld is 70 N/mm<sup>2</sup>. Determine the lengths of weld at the top and bottom. **06**



- Q.6 a)** A helical compression spring made of a circular wire is subjected to an axial force varying from 1000 N to 2000 N. Over this range of force, the deflection should be approximately 5 mm. The spring index is 5. The spring is made of steel wire of Grade 1 ( $G = 81370 \text{ N/mm}^2$ ). The constants A & m are 1753 and 0.182 respectively. The permissible shear stress for the spring wire is 50% of the ultimate tensile strength. Design for this spring the following. **08**
- wire diameter
  - mean coil diameter
  - number of active coils
- b)** The standard cross section for a flat key fitted on a 50 mm diameter shaft is (16 x 10) mm. The key is transmitting 475 N-m torque from the shaft to the hub. The key is made of steel ( $S_{yt} = S_{yc} = 230 \text{ N/mm}^2$ ). Determine the length of the key if the factor of safety is 3. **06**

- Q.7 a)** A wall bracket is attached to a wall by means of four identical bolts, two at A and two at B as shown in fig. (7-a). Assuming that the bracket is held against the wall and prevented from tipping about point C by all four bolts and using an allowable tensile stress in the bolts as  $35 \text{ N/mm}^2$ , determine the size of the bolts on the basis of maximum principal stress theory. **08**



- b)** Determine the expression to calculate the combined stiffness for the two helical springs connected in **06**
- series and
  - parallel

### Data for selection of Flat Belts

- Preferred diameters (in mm) of cast iron and mild steel pulleys are as below.  
100, 112, 125, 140, 160, 180, 200, 224, 250, 280, 315, 355, 400, 450, 500, 560, 630, 710, 800, 900, 1100
- Table for Load Correction Factor ( $F_a$ ):

Type of load	$F_a$
i) Normal load	1.0
ii) Steady load e.g. centrifugal pumps, fans light machine tools, conveyors	1.2
iii) International load e.g. heavy duty fans, blowers, compressors, reciprocating pumps, line shaft, heavy duty machines	1.3
iv) Shock load e.g. vacuum pumps, rolling mills, hammers, grinders	1.5

- Table for Arc of Contact Factor ( $F_d$ ):

$\alpha_s$ (Degrees)	120	130	140	150	160	170	180	190	200
$F_d$	1.33	1.26	1.19	1.13	1.08	1.04	1.00	0.97	0.94

- Power transmitting capacities of belts:  
HI-SPEED: 0.0118 kW per mm width per ply  
FORT: 0.0147 kW per mm width per ply

**5)** Table for standard widths of belts (in mm):

3-Ply	25	40	50	63	76					
4-Ply	40	44	50	63	76	90	100	112	125	152
5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

Seat No.	
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Set	R
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MACHANICAL ENGINEERING**  
**Design of Machine Elements**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Answer cannot be changed once it is marked.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Notch sensitivity  $q$  in terms of fatigue stress concentration factor  $K_f$  and theoretical stress stress concentration factor  $K_t$  is given by \_\_\_\_\_.  
 a)  $(K_f - 1) / (K_t - 1)$                       b)  $(K_t - 1) / (K_f - 1)$   
 c)  $K_f / K_t$                                       d)  $K_t / K_f$
- 2) The optimum velocity for Dunlop flat belts is approximately \_\_\_\_\_.  
 a) 5 m/s    b) 18 m/s  
 c) 50 m/s    d) 30 m/s
- 3) Throat of a weld  $t$  in terms of the leg length  $h$  is given by \_\_\_\_\_.  
 a)  $1.414h$     b)  $0.5h$   
 c)  $2h$     d)  $0.707h$
- 4) If the bolts are subjected to an eccentric load with the bolt axes perpendicular to the plane of line of application of load, every bolt will be subjected to \_\_\_\_\_.  
 a) primary & secondary shear forces  
 b) primary shear force & tensile force  
 c) primary shear force & compressive force  
 d) tensile force & secondary shear force
- 5) The first step in machine design procedure is \_\_\_\_\_.  
 a) Mechanism selection                      b) layout preparation  
 c) market survey                              d) Design of various parts
- 6) In case of repeated load which of the following is correct?  
 a)  $\sigma_m = 0$     b)  $\sigma_{min} = 0$   
 c)  $\sigma_{max} = 0$     d)  $\sigma_a = 0$
- 7) Factor of Safety is the ratio of \_\_\_\_\_.  
 a) working stress to failure stress  
 b) working load to failure load  
 c) impact load to static load  
 d) failure stress to working stress

- 8) Rankine's theory is preferred to design for \_\_\_\_\_.  
 a) ductile materials                      b) composite materials  
 c) brittle materials                      d) any material
- 9) Maximum shear stress in a shaft subjected to torsional and bending moments is given by \_\_\_\_\_.  
 a)  $16/\pi d^3 [(M_b)^2 + (M_t)^2]^{1/2}$   
 b)  $16/\pi d^3 [M_b + \{(M_b)^2 + (M_t)^2\}^{1/2}]$   
 c)  $16/\pi d^3 [M_t + \{(M_b)^2 + (M_t)^2\}^{1/2}]$   
 d)  $32/\pi d^3 [(M_b)^2 + (M_t)^2]^{1/2}$
- 10) The width & height of a square key are usually taken as \_\_\_\_\_.  
 a) d    b) d/6  
 c) d/8    d) d/4
- 11) The simplest type of couplings is \_\_\_\_\_.  
 a) clamp coupling                      b) muff coupling  
 c) flanged coupling                      d) flexible coupling
- 12) Wahl factor in spring design is given by \_\_\_\_\_.  
 a)  $4C - 4 / (4C - 1) + 0.615 / C$   
 b)  $4C - 1 / (4C - 4) + 0.615 / C$   
 c)  $3C - 4 / (3C - 1) + 0.615 / C$   
 d)  $3C - 1 / (3C - 4) + 0.615 / C$
- 13) For two springs connected in parallel, the combined stiffness is given by \_\_\_\_\_.  
 a)  $k_1 + k_2$                                   b)  $k_1 k_2$   
 c)  $k_1 k_2 / (k_1 + k_2)$                       d)  $(k_1 + k_2) / k_1 k_2$
- 14) Stress concentratin factor  $K_t$  with usual notations is given by,  
 a)  $\sigma_{max} / \sigma_{min}$                               b)  $\sigma_o / \sigma_{max}$   
 c)  $\sigma_{min} / \sigma_{max}$                               d)  $\sigma_{max} / \sigma_o$

Seat No.	
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Set **R**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MACHANICAL ENGINEERING**  
**Design of Machine Elements**

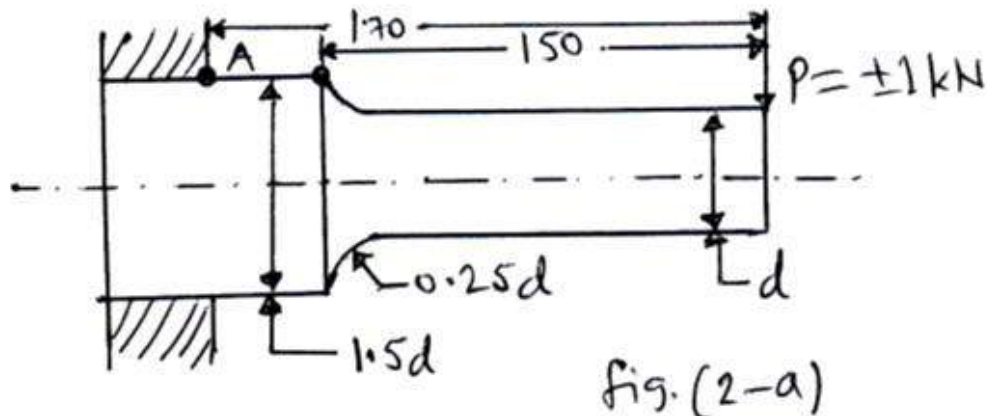
Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks.  
 4) Assume additional suitable data if necessary and state it clearly.  
 5) Draw the neat diagrams wherever required.

**Section – I**

- Q.2 a)** A cantilever beam made of cold drawn steel 20C8 ( $S_{ut} = 540 \text{ N/mm}^2$ ) is subjected to a completely reversed load of 1 kN as shown in fig. (2 - a). The notch sensitivity factor  $q$  at the fillet can be taken as 0.85. Take,  $K_a$  = surface finish factor = 0.78,  $K_b$  = size factor = 0.85,  $K_c$  = reliability factor = 0.897,  $K_t$  = stress concentration factor = 1.35. Determine the diameter of the beam for a life of 10000 cycles. **08**



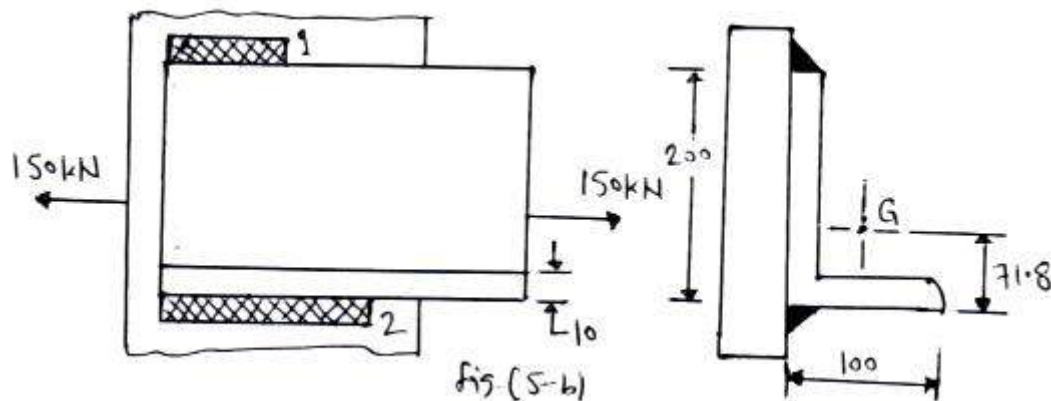
- b)** Explain with a block diagram the basic procedure of design of a machine element. **06**

- Q.3 a)** Two rods, required to withstand a tensile force of 30 kN, are connected by a knuckle joint. The rods and the pin are made of plain carbon steel 40C8 ( $S_{yt} = 380 \text{ N/mm}^2$ ). The factor of safety is 6. Calculate, **08**  
 i) The diameter of rods  
 ii) The diameter of the knuckle pin on the basis of bending failure.  
 Assume thickness of fork as 75 % of the rod diameter and thickness of eye as 125 % of the rod diameter.
- b)** What do you mean by stress concentration? Explain the causes of stress concentration in a component. **06**

- Q.4 a)** It is required to select a flat belt drive for a compressor running at 720 rpm driven by a 25 kW, 1440 rpm motor. The space is available for a centre distance of 3 m. The belt is open type. Assume a belt velocity of 18 m/s. The reference belt velocity may be taken as 5.08 m/s. Refer the data provided for flat belts. **08**
- b)** Discuss distortion energy theory of failure. State the important equations. **06**

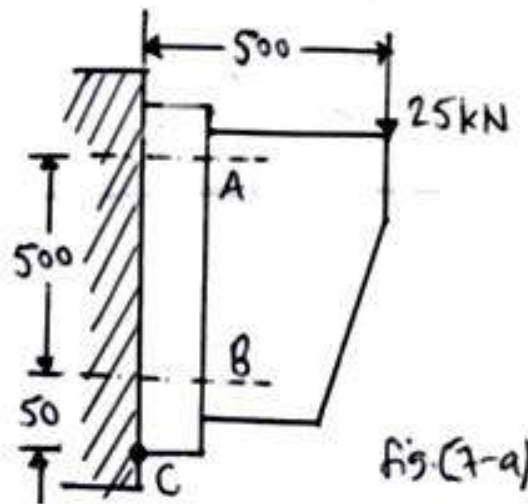
### Section – II

- Q.5 a)** A transmission shaft is supported on two bearings 1m apart. Power is supplied by a coupling located to the left of left hand bearing. Power is transmitted from the shaft by means of a belt pulley, 250 mm diameter, located at 300 mm from the left hand bearing. The mass of the pulley is 20 kg and the ratio of belt tensions on slack & tight sides is 2:1. The belt tensions act vertically downward. The shaft is made of steel F<sub>e</sub>E300 ( $S_{yt} = 300 \text{ N/mm}^2$ ) and the factor of safety is 3. Determine the shaft diameter if it transmits 10 kW power at 360 rpm. **08**
- b)** An ISA (200 x 100 x 10) mm angle is welded to a steel plate by fillet welds as shown in fig. (5-b). The angle is subjected to a static force of 150 kN and the permissible shear stress for the weld is 70 N/mm<sup>2</sup>. Determine the lengths of weld at the top and bottom. **06**



- Q.6 a)** A helical compression spring made of a circular wire is subjected to an axial force varying from 1000 N to 2000 N. Over this range of force, the deflection should be approximately 5 mm. The spring index is 5. The spring is made of steel wire of Grade 1 ( $G = 81370 \text{ N/mm}^2$ ). The constants A & m are 1753 and 0.182 respectively. The permissible shear stress for the spring wire is 50% of the ultimate tensile strength. Design for this spring the following. **08**
- wire diameter
  - mean coil diameter
  - number of active coils
- b)** The standard cross section for a flat key fitted on a 50 mm diameter shaft is (16 x 10) mm. The key is transmitting 475 N-m torque from the shaft to the hub. The key is made of steel ( $S_{yt} = S_{yc} = 230 \text{ N/mm}^2$ ). Determine the length of the key if the factor of safety is 3. **06**

- Q.7 a)** A wall bracket is attached to a wall by means of four identical bolts, two at A and two at B as shown in fig. (7-a). Assuming that the bracket is held against the wall and prevented from tipping about point C by all four bolts and using an allowable tensile stress in the bolts as  $35 \text{ N/mm}^2$ , determine the size of the bolts on the basis of maximum principal stress theory. **08**



- b)** Determine the expression to calculate the combined stiffness for the two helical springs connected in **06**
- series and
  - Parallel

### Data for selection of Flat Belts

- Preferred diameters (in mm) of cast iron and mild steel pulleys are as below.  
100, 112, 125, 140, 160, 180, 200, 224, 250, 280, 315, 355, 400, 450, 500, 560, 630, 710, 800, 900, 1100
- Table for Load Correction Factor ( $F_a$ ):

Type of load	$F_a$
i) Normal load	1.0
ii) Steady load e.g. centrifugal pumps, fans light machine tools, conveyors	1.2
iii) International load e.g. heavy duty fans, blowers, compressors, reciprocating pumps, line shaft, heavy duty machines	1.3
iv) Shock load e.g. vacuum pumps, rolling mills, hammers, grinders	1.5

- Table for Arc of Contact Factor ( $F_d$ ):

$\alpha_s$ (Degrees)	120	130	140	150	160	170	180	190	200
$F_d$	1.33	1.26	1.19	1.13	1.08	1.04	1.00	0.97	0.94

- Power transmitting capacities of belts:  
HI-SPEED: 0.0118 kW per mm width per ply  
FORT: 0.0147 kW per mm width per ply



**5)** Table for standard widths of belts (in mm):

3-Ply	25	40	50	63	76					
4-Ply	40	44	50	63	76	90	100	112	125	152
5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

**Seat  
No.**

Set	S
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## Max. Marks: 70

Marks:14

## 14

- Page 19 of 24

- 9) If the bolts are subjected to an eccentric load with the bolt axes perpendicular to the plane of line of application of load, every bolt will be subjected to \_\_\_\_\_.  
 a) primary & secondary shear forces  
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 b)  $16/\pi d^3 [M_b + \{(M_b)^2 + (M_t)^2\}^{1/2}]$   
 c)  $16/\pi d^3 [M_t + \{(M_b)^2 + (M_t)^2\}^{1/2}]$   
 d)  $32/\pi d^3 [(M_b)^2 + (M_t)^2]^{1/2}$

Seat No.	
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Set **S**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MACHANICAL ENGINEERING**  
**Design of Machine Elements**

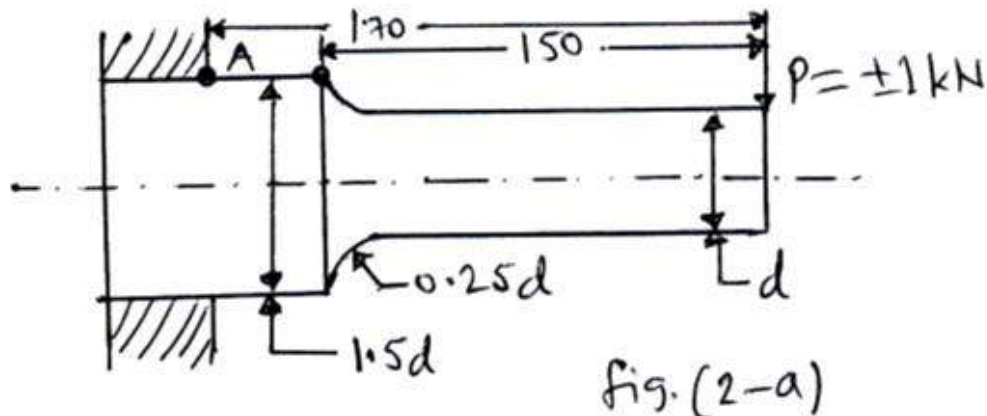
Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks.  
 4) Assume additional suitable data if necessary and state it clearly.  
 5) Draw the neat diagrams wherever required.

**Section – I**

- Q.2 a)** A cantilever beam made of cold drawn steel 20C8 ( $S_{ut} = 540 \text{ N/mm}^2$ ) is subjected to a completely reversed load of 1 kN as shown in fig. (2 - a). The notch sensitivity factor  $q$  at the fillet can be taken as 0.85. Take,  $K_a$  = surface finish factor = 0.78,  $K_b$  = size factor = 0.85,  $K_c$  = reliability factor = 0.897,  $K_t$  = stress concentration factor = 1.35. Determine the diameter of the beam for a life of 10000 cycles. **08**



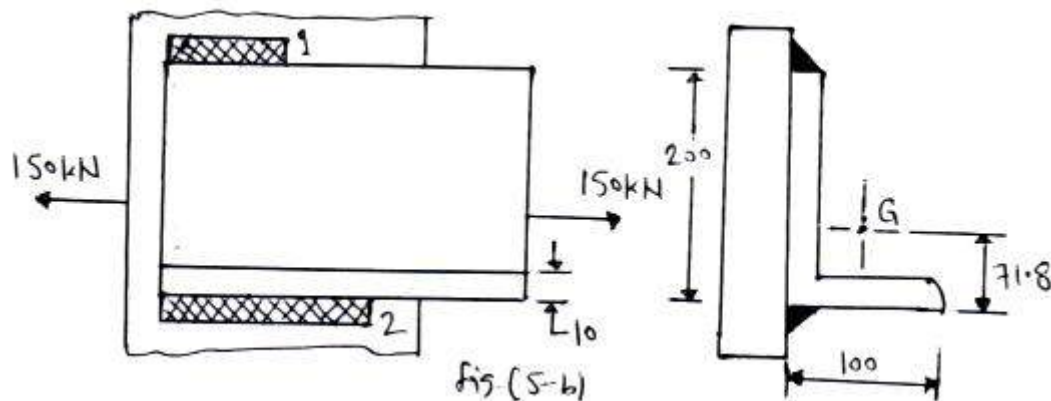
- b)** Explain with a block diagram the basic procedure of design of a machine element. **06**

- Q.3 a)** Two rods, required to withstand a tensile force of 30 kN, are connected by a knuckle joint. The rods and the pin are made of plain carbon steel 40C8 ( $S_{yt} = 380 \text{ N/mm}^2$ ). The factor of safety is 6. Calculate, **08**  
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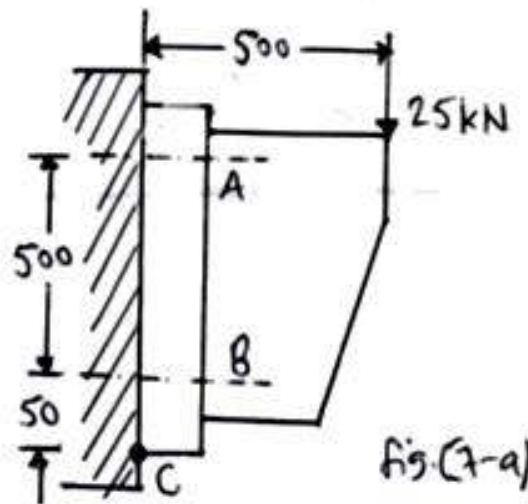
### Section – II

- Q.5 a)** A transmission shaft is supported on two bearings 1m apart. Power is supplied by a coupling located to the left of left hand bearing. Power is transmitted from the shaft by means of a belt pulley, 250 mm diameter, located at 300 mm from the left hand bearing. The mass of the pulley is 20 kg and the ratio of belt tensions on slack & tight sides is 2:1. The belt tensions act vertically downward. The shaft is made of steel F<sub>e</sub>E300 ( $S_{yt} = 300 \text{ N/mm}^2$ ) and the factor of safety is 3. Determine the shaft diameter if it transmits 10 kW power at 360 rpm. **08**
- b)** An ISA (200 x 100 x 10) mm angle is welded to a steel plate by fillet welds as shown in fig. (5-b). The angle is subjected to a static force of 150 kN and the permissible shear stress for the weld is 70 N/mm<sup>2</sup>. Determine the lengths of weld at the top and bottom. **06**



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- b)** Determine the expression to calculate the combined stiffness for the two helical springs connected in **06**
- series and
  - Parallel

### Data for selection of Flat Belts

- 1)** Preferred diameters (in mm) of cast iron and mild steel pulleys are as below.  
100, 112, 125, 140, 160, 180, 200, 224, 250, 280, 315, 355, 400, 450, 500, 560, 630, 710, 800, 900, 1100

- 2)** Table for Load Correction Factor ( $F_a$ ):

Type of load	$F_a$
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- 3)** Table for Arc of Contact Factor ( $F_d$ ):

$\alpha_s$ (Degrees)	120	130	140	150	160	170	180	190	200
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- 4)** Power transmitting capacities of belts:  
HI-SPEED: 0.0118 kW per mm width per ply  
FORT: 0.0147 kW per mm width per ply

**5) Table for standard widths of belts (in mm):**

3-Ply	25	40	50	63	76					
4-Ply	40	44	50	63	76	90	100	112	125	152
5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

<b>Seat No.</b>	
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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 PM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data if required.
- 5) Use of scientific calculator is allowed.

Marks: 14

14

- 1) NC machines used for drilling, boring, reaming, tapping is \_\_\_\_\_.  
a) Contouring type                      b) Straight cut  
c) Point to point                        d) None of the above
- 2) Windowing transformation means \_\_\_\_\_.  
a) Window to viewport transformation  
b) Geometric transformation  
c) Vertices transformation  
d) None of these
- 3) Miscellaneous function used for Coolant off is \_\_\_\_\_.  
a) M 07                                      b) M 09  
c) M 08                                      d) M 10
- 4) Concatenations can be done using \_\_\_\_\_.  
a) Viewing coordinates                  b) Polar coordinate  
c) Cylindrical coordinate                d) Homogeneous coordinate
- 5) The preparatory function used for circular clockwise interpolation function is \_\_\_\_\_.  
a) G03                                        b) G02  
c) G04                                        d) G01
- 6) In the following geometric modeling which is not 3D modeling?  
a) Wireframe modeling                    b) Surface modeling  
c) Drafting                                    d) Solid Modeling
- 7) Retrieval type and generative type are the types of \_\_\_\_\_.  
a) F.M.S.                                     b) Group Technology  
c) C.A.P.P.                                   d) DNC
- 8) Which type of tool magazines are generally used to handle large number of tools?  
a) Drum type                                b) Chain type  
c) Turret type                                d) Both a & b



- 9)** The curve which is tangent at first and last segment of polygon is \_\_\_\_\_.  
a) Bezier Curve                                      b) Spline Curve  
c) Hermite Curve                                    d) None of the above
- 10)** In numerical control systems, DNC stands for \_\_\_\_\_.  
a) Dedicated Numerical Control      b) Direct Numerical Control  
c) Distributed Numerical Control      d) b & c
- 11)** Creation, analysis, modification and optimization is \_\_\_\_\_.  
a) CIM    b) CAD  
c) CAM     d) CAD/CAM
- 12)** The machine zero on lathe is generally set on the machine at \_\_\_\_\_.  
a) Top right side                                  b) Top left side  
c) At top mid position                          d) None of the above
- 13)** CSG is a \_\_\_\_\_.  
a) Wire frame modeling scheme      b) Solid modeling scheme  
c) Surface modeling scheme              d) All the above
- 14)** FANUC, CNUMERIC, SIEMENS are CNC \_\_\_\_\_.  
a) Programming language                  b) Controllers  
c) Machines                                         d) None

Seat No.	
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Set	P
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM-CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 PM To 01:00 PM

Max. Marks: 56

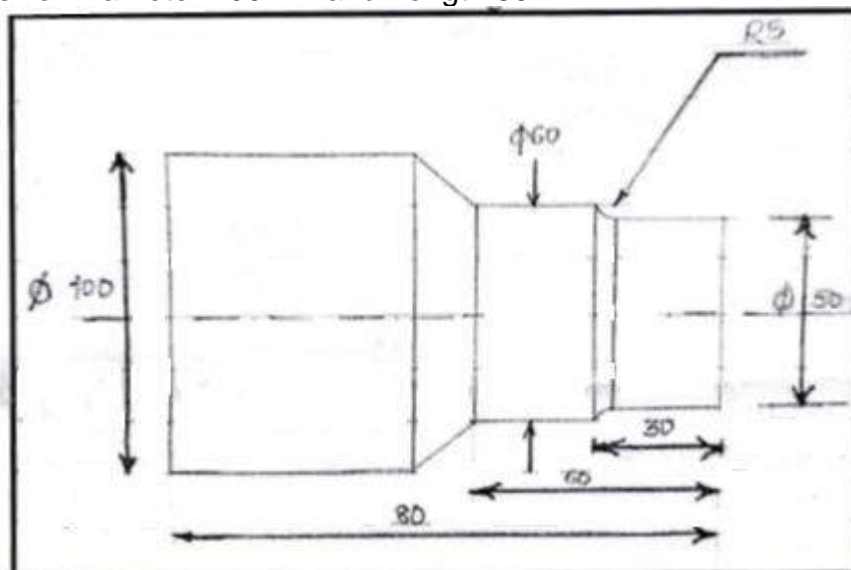
- Instructions:**
- 1) Assume suitable data if required.
  - 2) Use of scientific calculator is allowed.
  - 3) Figure to the right indicates full marks.
  - 4) Solve any TWO questions from Q. No. 2 to Q.No.4.
  - 5) Question No 5 is Compulsory.
  - 6) Solve any ONE question from Q. No.6 and Q.No.7.

**Section – I**

- Q.2** a) Explain Product cycle with respect to CAD-CAM-CAE. **08**  
 b) Enlist the schemes of solid modeling? Explain any one. **06**
- Q.3** a) What is meant by Geometrical transformations? Explain types of Geometrical transformations with equation. **08**  
 b) Enlist the different types of FE analysis. Explain any 02 types in detail. **06**
- Q.4** a) Translate a triangle with coordinates A (1,1), B (3,3) and C (4,1) by 5 units in X-direction and 2 units in Y-direction. **08**  
 b) Discuss the concept of Flexible Manufacturing System (FMS) with industrial application and neat sketch. **06**

**Section – II**

- Q.5** a) For following component make a part program on CNC machine. **08**  
 Work material: Mild steel, Tool materials: HSS,  
 Work size: Diameter 100mm and Length 80 mm.



- |            |           |   |           |
|------------|-----------|---|-----------|
|            | <b>b)</b> | Enlist the different G and M codes with their meaning and explain any 01. | <b>06</b> |
| <b>Q.6</b> | <b>a)</b> | Describe Automatic Tool Changer with neat sketch.                         | <b>08</b> |
|            | <b>b)</b> | Explain types of DNC with neat sketch.                                    | <b>06</b> |
| <b>Q.7</b> | <b>a)</b> | Explain Tool length and cutter diameter compensation with example.        | <b>08</b> |
|            | <b>b)</b> | Explain types of NC System.   | <b>06</b> |

<b>Seat No.</b>	
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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 PM To 01:00 PM

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data if required.
- 5) Use of scientific calculator is allowed.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Which type of tool magazines are generally used to handle large number of tools?

a) Drum type	b) Chain type
c) Turret type	d) Both a & b
- 2) The curve which is tangent at first and last segment of polygon is \_\_\_\_\_.

a) Bezier Curve	b) Spline Curve
c) Hermite Curve	d) None of the above
- 3) In numerical control systems, DNC stands for \_\_\_\_\_.

a) Dedicated Numerical Control	b) Direct Numerical Control
c) Distributed Numerical Control	d) b & c
- 4) Creation, analysis, modification and optimization is \_\_\_\_\_.

a) CIM	b) CAD
c) CAM	d) CAD/CAM
- 5) The machine zero on lathe is generally set on the machine at \_\_\_\_\_.

a) Top right side	b) Top left side
c) At top mid position	d) None of the above
- 6) CSG is a \_\_\_\_\_.

a) Wire frame modeling scheme	b) Solid modeling scheme
c) Surface modeling scheme	d) All the above
- 7) FANUC, CNUMERIC, SIEMENS are CNC \_\_\_\_\_.

a) Programming language	b) Controllers
c) Machines	d) None
- 8) NC machines used for drilling, boring, reaming, tapping is \_\_\_\_\_.

a) Contouring type	b) Straight cut
c) Point to point	d) None of the above

- 9) Windowing transformation means \_\_\_\_\_.  
a) Window to viewport transformation  
b) Geometric transformation  
c) Vertices transformation  
d) None of these
- 10) Miscellaneous function used for Coolant off is \_\_\_\_\_.  
a) M 07  
b) M 09  
c) M 08  
d) M 10
- 11) Concatenations can be done using \_\_\_\_\_.  
a) Viewing coordinates  
b) Polar coordinate  
c) Cylindrical coordinate  
d) Homogeneous coordinate
- 12) The preparatory function used for circular clockwise interpolation function is \_\_\_\_\_.  
a) G03  
b) G02  
c) G04  
d) G01
- 13) In the following geometric modeling which is not 3D modeling?  
a) Wireframe modeling  
b) Surface modeling  
c) Drafting  
d) Solid Modeling
- 14) Retrieval type and generative type are the types of \_\_\_\_\_.  
a) F.M.S.  
b) Group Technology  
c) C.A.P.P.  
d) DNC

Seat No.	
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Set **Q**

**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM-CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 PM To 01:00 PM

Max. Marks: 56

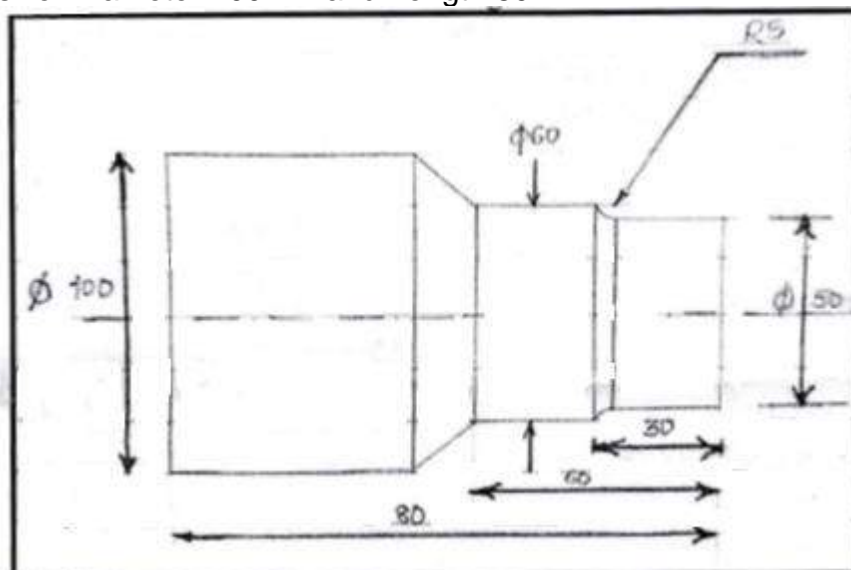
- Instructions:**
- 1) Assume suitable data if required.
  - 2) Use of scientific calculator is allowed.
  - 3) Figure to the right indicates full marks.
  - 4) Solve any TWO questions from Q. No. 2 to Q.No.4.
  - 5) Question No 5 is Compulsory.
  - 6) Solve any ONE question from Q. No.6 and Q.No.7.

**Section – I**

- Q.2** a) Explain Product cycle with respect to CAD-CAM-CAE. **08**  
 b) Enlist the schemes of solid modeling? Explain any one. **06**
- Q.3** a) What is meant by Geometrical transformations? Explain types of Geometrical transformations with equation. **08**  
 b) Enlist the different types of FE analysis. Explain any 02 types in detail. **06**
- Q.4** a) Translate a triangle with coordinates A (1,1), B (3,3) and C (4,1) by 5 units in X-direction and 2 units in Y-direction. **08**  
 b) Discuss the concept of Flexible Manufacturing System (FMS) with industrial application and neat sketch. **06**

**Section – II**

- Q.5** a) For following component make a part program on CNC machine. **08**  
 Work material: Mild steel, Tool materials: HSS,  
 Work size: Diameter 100mm and Length 80 mm.



- |            |           |   |           |
|------------|-----------|---|-----------|
|            | <b>b)</b> | Enlist the different G and M codes with their meaning and explain any 01. | <b>06</b> |
| <b>Q.6</b> | <b>a)</b> | Describe Automatic Tool Changer with neat sketch.                         | <b>08</b> |
|            | <b>b)</b> | Explain types of DNC with neat sketch.                                    | <b>06</b> |
| <b>Q.7</b> | <b>a)</b> | Explain Tool length and cutter diameter compensation with example.        | <b>08</b> |
|            | <b>b)</b> | Explain types of NC System.   | <b>06</b> |

<b>Seat No.</b>	
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## Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

14

- Page 9 of 16



- 9) The preparatory function used for circular clockwise interpolation function is \_\_\_\_\_.  
a) G03                                      b) G02  
c) G04                                      d) G01
- 10) In the following geometric modeling which is not 3D modeling?  
a) Wireframe modeling                  b) Surface modeling  
c) Drafting                                 d) Solid Modeling
- 11) Retrieval type and generative type are the types of \_\_\_\_\_.  
a) F.M.S.                                    b) Group Technology  
c) C.A.P.P.                                 d) DNC
- 12) Which type of tool magazines are generally used to handle large number of tools?  
a) Drum type                                b) Chain type  
c) Turret type                               d) Both a & b
- 13) The curve which is tangent at first and last segment of polygon is \_\_\_\_\_.  
a) Bezier Curve                            b) Spline Curve  
c) Hermite Curve                         d) None of the above
- 14) In numerical control systems, DNC stands for \_\_\_\_\_.  
a) Dedicated Numerical Control      b) Direct Numerical Control  
c) Distributed Numerical Control      d) b & c

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM-CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 PM To 01:00 PM

Max. Marks: 56

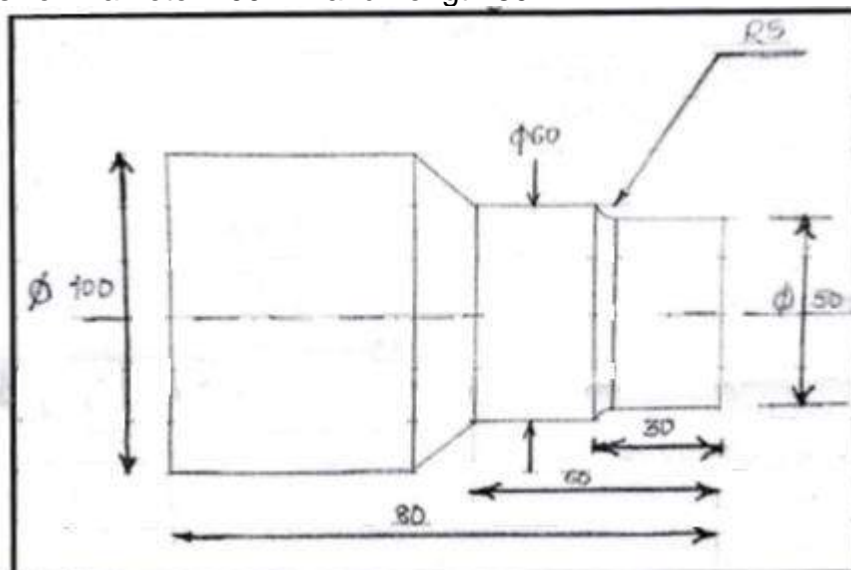
- Instructions:**
- 1) Assume suitable data if required.
  - 2) Use of scientific calculator is allowed.
  - 3) Figure to the right indicates full marks.
  - 4) Solve any TWO questions from Q. No. 2 to Q.No.4.
  - 5) Question No 5 is Compulsory.
  - 6) Solve any ONE question from Q. No.6 and Q.No.7.

**Section – I**

- Q.2** a) Explain Product cycle with respect to CAD-CAM-CAE. **08**  
 b) Enlist the schemes of solid modeling? Explain any one. **06**
- Q.3** a) What is meant by Geometrical transformations? Explain types of Geometrical transformations with equation. **08**  
 b) Enlist the different types of FE analysis. Explain any 02 types in detail. **06**
- Q.4** a) Translate a triangle with coordinates A (1,1), B (3,3) and C (4,1) by 5 units in X-direction and 2 units in Y-direction. **08**  
 b) Discuss the concept of Flexible Manufacturing System (FMS) with industrial application and neat sketch. **06**

**Section – II**

- Q.5** a) For following component make a part program on CNC machine. **08**  
 Work material: Mild steel, Tool materials: HSS,  
 Work size: Diameter 100mm and Length 80 mm.



- |            |           |   |           |
|------------|-----------|---|-----------|
|            | <b>b)</b> | Enlist the different G and M codes with their meaning and explain any 01. | <b>06</b> |
| <b>Q.6</b> | <b>a)</b> | Describe Automatic Tool Changer with neat sketch.                         | <b>08</b> |
|            | <b>b)</b> | Explain types of DNC with neat sketch.                                    | <b>06</b> |
| <b>Q.7</b> | <b>a)</b> | Explain Tool length and cutter diameter compensation with example.        | <b>08</b> |
|            | <b>b)</b> | Explain types of NC System.   | <b>06</b> |

Seat No.	
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM-CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 PM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if required.  
 5) Use of scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In the following geometric modeling which is not 3D modeling?  
 a) Wireframe modeling                      b) Surface modeling  
 c) Drafting                                      d) Solid Modeling
- 2) Retrieval type and generative type are the types of \_\_\_\_\_.  
 a) F.M.S.                                      b) Group Technology  
 c) C.A.P.P.                                      d) DNC
- 3) Which type of tool magazines are generally used to handle large number of tools?  
 a) Drum type                                      b) Chain type  
 c) Turret type                                      d) Both a & b
- 4) The curve which is tangent at first and last segment of polygon is \_\_\_\_\_.  
 a) Bezier Curve                                      b) Spline Curve  
 c) Hermite Curve                                      d) None of the above
- 5) In numerical control systems, DNC stands for \_\_\_\_\_.  
 a) Dedicated Numerical Control                      b) Direct Numerical Control  
 c) Distributed Numerical Control                      d) b & c
- 6) Creation, analysis, modification and optimization is \_\_\_\_\_.  
 a) CIM                                      b) CAD  
 c) CAM                                      d) CAD/CAM
- 7) The machine zero on lathe is generally set on the machine at \_\_\_\_\_.  
 a) Top right side                                      b) Top left side  
 c) At top mid position                                      d) None of the above
- 8) CSG is a \_\_\_\_\_.  
 a) Wire frame modeling scheme                      b) Solid modeling scheme  
 c) Surface modeling scheme                      d) All the above
- 9) FANUC, CNUMERIC, SIEMENS are CNC \_\_\_\_\_.  
 a) Programming language                      b) Controllers  
 c) Machines                                      d) None

- 10) NC machines used for drilling, boring, reaming, tapping is \_\_\_\_\_.
  - a) Contouring type
  - b) Straight cut
  - c) Point to point
  - d) None of the above
- 11) Windowing transformation means \_\_\_\_\_.
  - a) Window to viewport transformation
  - b) Geometric transformation
  - c) Vertices transformation
  - d) None of these
- 12) Miscellaneous function used for Coolant off is \_\_\_\_\_.
  - a) M 07
  - b) M 09
  - c) M 08
  - d) M 10
- 13) Concatenations can be done using \_\_\_\_\_.
  - a) Viewing coordinates
  - b) Polar coordinate
  - c) Cylindrical coordinate
  - d) Homogeneous coordinate
- 14) The preparatory function used for circular clockwise interpolation function is \_\_\_\_\_.
  - a) G03
  - b) G02
  - c) G04
  - d) G01

Seat No.	
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM-CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 PM To 01:00 PM

Max. Marks: 56

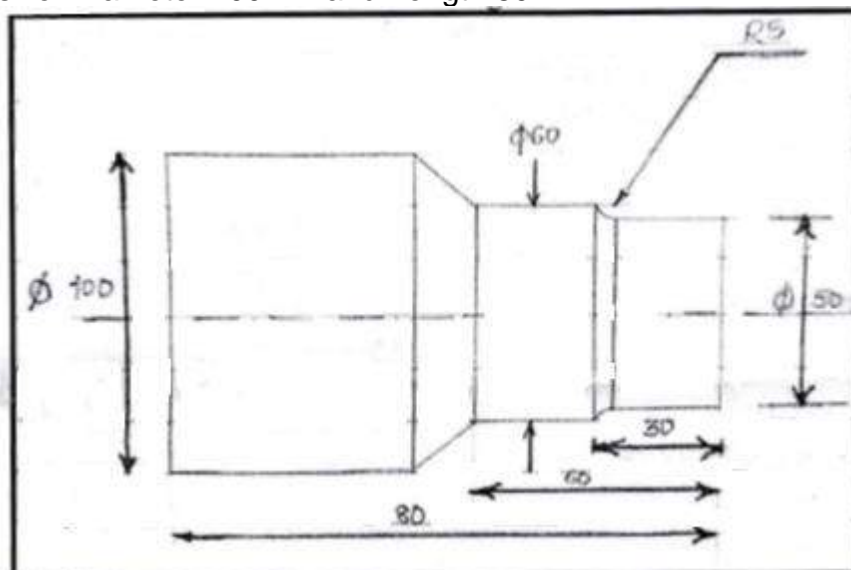
- Instructions:**
- 1) Assume suitable data if required.
  - 2) Use of scientific calculator is allowed.
  - 3) Figure to the right indicates full marks.
  - 4) Solve any TWO questions from Q. No. 2 to Q.No.4.
  - 5) Question No 5 is Compulsory.
  - 6) Solve any ONE question from Q. No.6 and Q.No.7.

**Section – I**

- Q.2** a) Explain Product cycle with respect to CAD-CAM-CAE. **08**  
 b) Enlist the schemes of solid modeling? Explain any one. **06**
- Q.3** a) What is meant by Geometrical transformations? Explain types of Geometrical transformations with equation. **08**  
 b) Enlist the different types of FE analysis. Explain any 02 types in detail. **06**
- Q.4** a) Translate a triangle with coordinates A (1,1), B (3,3) and C (4,1) by 5 units in X-direction and 2 units in Y-direction. **08**  
 b) Discuss the concept of Flexible Manufacturing System (FMS) with industrial application and neat sketch. **06**

**Section – II**

- Q.5** a) For following component make a part program on CNC machine. **08**  
 Work material: Mild steel, Tool materials: HSS,  
 Work size: Diameter 100mm and Length 80 mm.



- |            |           |   |           |
|------------|-----------|---|-----------|
|            | <b>b)</b> | Enlist the different G and M codes with their meaning and explain any 01. | <b>06</b> |
| <b>Q.6</b> | <b>a)</b> | Describe Automatic Tool Changer with neat sketch.                         | <b>08</b> |
|            | <b>b)</b> | Explain types of DNC with neat sketch.                                    | <b>06</b> |
| <b>Q.7</b> | <b>a)</b> | Explain Tool length and cutter diameter compensation with example.        | <b>08</b> |
|            | <b>b)</b> | Explain types of NC System.   | <b>06</b> |

**Seat  
No.**

Set | P

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.

Duration: 30 Minutes

Marks: 14

## 14

- 1) How is cooling of the material done is normalising process?

  - a) Furnace
  - b) Cooling tower
  - c) Still air
  - d) Liquid chamber
- 2) Phase transformation during hardening transforms \_\_\_\_\_.

  - a) BCC to FCC
  - b) FCC to BCT
  - c) BCT to HCP
  - d) FCC to HCP
- 3) \_\_\_\_\_ is a eutectic mixture of  $\alpha$  iron and Fe<sub>3</sub>C..

  - a) Pearlite
  - b) Martensite
  - c) Ledeburite
  - d) Sorbite
- 4) Which reaction does this equation denote?  
Liquid → Solid 2 + Solid 1

  - a) Eutectic
  - b) Peritectic
  - c) Eutectoid
  - d) Peritectoid
- 5) In which of the following test specimen is in the form of the simply supported beam?

  - a) Izod test
  - b) Rockwell hardness test
  - c) Charpy test
  - d) Brinell test
- 6) What is the crystal structure of  $\gamma$ -Gamma iron?

  - a) Face-centered cubic
  - b) Body-centered cubic
  - c) Hexagonal closely packed
  - d) Body-centered tetrahedral
- 7) Which of the following compound is used for fine polishing as Levigating Powder?

  - a) Iron oxide
  - b) Nitric oxide
  - c) Silicon carbide
  - d) Aluminum oxide
- 8) Permanent deformation of material with respect to time due to constant load and variable temperature is termed as \_\_\_\_\_.

  - a) Elasticity
  - b) Isotropy
  - c) Hardness
  - d) Creep





Seat No.	
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Set

P

**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
 2) Answer any two questions from Section I and Section II.  
 3) Figures to the right indicates full marks.

**Section – I**

- Q.2** a) Draw Fe-Fe<sub>3</sub>C equilibrium diagram. Label all the constituents and temperatures correctly. **06**  
 b) Explain the following terms in brief: **04**  
 1) Eutectic transformations  
 2) Curie Temperature  
 3) Alfa-Ferrite  
 4) Hypo Eutectoid Steel  
 c) Draw the microstructure of 0.4% C and 1.4% C Steel. **04**
- Q.3** a) Give typical composition, properties and application of any 5 of the following. **10**  
 1) HSLA  
 2) Naval Brass  
 3) HSS  
 4) Invar  
 5) Babbitt  
 6) Tool Steel  
 7) OHNS  
 b) Compare between Brasses and Bronzes. **04**
- Q.4** Write a note on any three of the following. **14**  
 a) Gibbs Phase Rule  
 b) Grey Cast Iron  
 c) Classification of Metallic Materials  
 d) Critical Temperatures in Iron-iron Carbide diagram  
 e) Nano Materials

**Section – II**

- Q.5** a) Draw T-T-T Diagram for eutectoid steel. **05**  
 b) What are the characteristics Martensitic Transformation? **05**  
 c) Explain different quenching media used in Heat Treatment. **04**
- Q.6** a) Compare between Annealing and Normalizing. **04**  
 b) Explain with sketch the advantages and limitations of Eddy Current Test. **05**  
 c) Discuss the manufacturing process of powder metallurgy product. **05**

<b>Q.7</b>	<b>a)</b>	Draw Stress strain curve for mild steel and cast.	<b>04</b>
	<b>b)</b>	Draw flow chart for manufacture of self-lubricating bearings.	<b>04</b>
	<b>c)</b>	Explain the process of tempering in details.	<b>03</b>
	<b>d)</b>	Compare between Charpy & Izod Impact Test.	<b>03</b>

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 5 of 16

- 9) Phase transformation during hardening transforms \_\_\_\_\_.
  - a) BCC to FCC
  - b) FCC to BCT
  - c) BCT to HCP
  - d) FCC to HCP
- 10) \_\_\_\_\_ is a eutectic mixture of  $\alpha$  iron and Fe<sub>3</sub>C..
  - a) Pearlite
  - b) Martensite
  - c) Ledeburite
  - d) Sorbite
- 11) Which reaction does this equation denote?  
Liquid  $\rightarrow$  Solid 2 + Solid 1
  - a) Eutectic
  - b) Peritectic
  - c) Eutectoid
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- 12) In which of the following test specimen is in the form of the simply supported beam?
  - a) Izod test
  - b) Rockwell hardness test
  - c) Charpy test
  - d) Brinell test
- 13) What is the crystal structure of  $\gamma$ -Gamma iron?
  - a) Face-centered cubic
  - b) Body-centered cubic
  - c) Hexagonal closely packed
  - d) Body-centered tetrahedral
- 14) Which of the following compound is used for fine polishing as Levigating Powder?
  - a) Iron oxide
  - b) Nitric oxide
  - c) Silicon carbide
  - d) Aluminum oxide

Seat No.	
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Set	Q
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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
 2) Answer any two questions from Section I and Section II.  
 3) Figures to the right indicates full marks.

**Section – I**

- Q.2** a) Draw Fe-Fe<sub>3</sub>C equilibrium diagram. Label all the constituents and temperatures correctly. **06**  
 b) Explain the following terms in brief: **04**  
 1) Eutectic transformations  
 2) Curie Temperature  
 3) Alfa-Ferrite  
 4) Hypo Eutectoid Steel  
 c) Draw the microstructure of 0.4% C and 1.4% C Steel. **04**
- Q.3** a) Give typical composition, properties and application of any 5 of the following. **10**  
 1) HSLA  
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 4) Invar  
 5) Babbitt  
 6) Tool Steel  
 7) OHNS  
 b) Compare between Brasses and Bronzes. **04**
- Q.4** Write a note on any three of the following. **14**  
 a) Gibbs Phase Rule  
 b) Grey Cast Iron  
 c) Classification of Metallic Materials  
 d) Critical Temperatures in Iron-iron Carbide diagram  
 e) Nano Materials

**Section – II**

- Q.5** a) Draw T-T-T Diagram for eutectoid steel. **05**  
 b) What are the characteristics Martensitic Transformation? **05**  
 c) Explain different quenching media used in Heat Treatment. **04**
- Q.6** a) Compare between Annealing and Normalizing. **04**  
 b) Explain with sketch the advantages and limitations of Eddy Current Test. **05**  
 c) Discuss the manufacturing process of powder metallurgy product. **05**

- |            |           |   |           |
|------------|-----------|---|-----------|
| <b>Q.7</b> | <b>a)</b> | Draw Stress strain curve for mild steel and cast.             | <b>04</b> |
|            | <b>b)</b> | Draw flow chart for manufacture of self-lubricating bearings. | <b>04</b> |
|            | <b>c)</b> | Explain the process of tempering in details.                  | <b>03</b> |
|            | <b>d)</b> | Compare between Charpy & Izod Impact Test.                    | <b>03</b> |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The eutectic point in the iron-iron carbide phase diagram occurs at \_\_\_\_\_ weight % composition of carbon.
 

a) 0.022	b) 0.77
c) 2.11	d) 4.3
- 2) Which of the following properties are determined by impact test?
 

a) Relative Toughness	b) True Toughness
c) Elongation	d) Ductility
- 3) Which of the following NDT is fast method of testing?
 

a) DPT	b) MPT
c) Eddy Current	d) UT
- 4) Which of the following components are manufactured by Powder Metallurgy?
 

a) Carbide tool tip	b) Piston
c) Cermets	d) Ball Bearing Balls
- 5) How is cooling of the material done is normalising process?
 

a) Furnace	b) Cooling tower
c) Still air	d) Liquid chamber
- 6) Phase transformation during hardening transforms \_\_\_\_\_.
 

a) BCC to FCC	b) FCC to BCT
c) BCT to HCP	d) FCC to HCP
- 7) \_\_\_\_\_ is a eutectic mixture of  $\alpha$  iron and Fe<sub>3</sub>C..
 

a) Pearlite	b) Martensite
c) Ledeburite	d) Sorbite
- 8) Which reaction does this equation denote?  
 Liquid  $\rightarrow$  Solid 2 + Solid 1
 

a) Eutectic	b) Peritectic
c) Eutectoid	d) Peritectoid



- 9) In which of the following test specimen is in the form of the simply supported beam?
- |                |                           |
|----------------|---------------------------|
| a) Izod test   | b) Rockwell hardness test |
| c) Charpy test | d) Brinell test           |
- 10) What is the crystal structure of  $\gamma$ -Iron?
- |                             |                              |
|-----------------------------|------------------------------|
| a) Face-centered cubic      | b) Body-centered cubic       |
| c) Hexagonal closely packed | d) Body-centered tetrahedral |
- 11) Which of the following compound is used for fine polishing as Levigating Powder?
- |                    |                   |
|--------------------|-------------------|
| a) Iron oxide      | b) Nitric oxide   |
| c) Silicon carbide | d) Aluminum oxide |
- 12) Permanent deformation of material with respect to time due to constant load and variable temperature is termed as \_\_\_\_\_.
- |               |             |
|---------------|-------------|
| a) Elasticity | b) Isotropy |
| c) Hardness   | d) Creep    |
- 13) Magnetic Particle Test can be done on \_\_\_\_\_.
- |           |                       |
|-----------|-----------------------|
| a) Brass  | b) Plain Carbon Steel |
| c) Bronze | d) Invar              |
- 14) For Annealing of hypereutectoid steels, they are heated in a range above \_\_\_\_.
- |                               |                               |
|-------------------------------|-------------------------------|
| a) $910 \pm 50^\circ\text{C}$ | b) $273 + 50^\circ\text{C}$   |
| c) $551-770^\circ\text{C}$    | d) $723 \pm 50^\circ\text{C}$ |

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
 2) Answer any two questions from Section I and Section II.  
 3) Figures to the right indicates full marks.

**Section – I**

- Q.2** a) Draw Fe-Fe<sub>3</sub>C equilibrium diagram. Label all the constituents and temperatures correctly. **06**  
 b) Explain the following terms in brief: **04**  
 1) Eutectic transformations  
 2) Curie Temperature  
 3) Alfa-Ferrite  
 4) Hypo Eutectoid Steel  
 c) Draw the microstructure of 0.4% C and 1.4% C Steel. **04**
- Q.3** a) Give typical composition, properties and application of any 5 of the following. **10**  
 1) HSLA  
 2) Naval Brass  
 3) HSS  
 4) Invar  
 5) Babbitt  
 6) Tool Steel  
 7) OHNS  
 b) Compare between Brasses and Bronzes. **04**
- Q.4** Write a note on any three of the following. **14**  
 a) Gibbs Phase Rule  
 b) Grey Cast Iron  
 c) Classification of Metallic Materials  
 d) Critical Temperatures in Iron-iron Carbide diagram  
 e) Nano Materials

**Section – II**

- Q.5** a) Draw T-T-T Diagram for eutectoid steel. **05**  
 b) What are the characteristics Martensitic Transformation? **05**  
 c) Explain different quenching media used in Heat Treatment. **04**
- Q.6** a) Compare between Annealing and Normalizing. **04**  
 b) Explain with sketch the advantages and limitations of Eddy Current Test. **05**  
 c) Discuss the manufacturing process of powder metallurgy product. **05**

<b>Q.7</b>	<b>a)</b>	Draw Stress strain curve for mild steel and cast.	<b>04</b>
	<b>b)</b>	Draw flow chart for manufacture of self-lubricating bearings.	<b>04</b>
	<b>c)</b>	Explain the process of tempering in details.	<b>03</b>
	<b>d)</b>	Compare between Charpy & Izod Impact Test.	<b>03</b>

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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) What is the crystal structure of  $\gamma$ -Iron?
  - a) Face-centered cubic
  - b) Body-centered cubic
  - c) Hexagonal closely packed
  - d) Body-centered tetrahedral
- 2) Which of the following compound is used for fine polishing as Levigating Powder?
  - a) Iron oxide
  - b) Nitric oxide
  - c) Silicon carbide
  - d) Aluminum oxide
- 3) Permanent deformation of material with respect to time due to constant load and variable temperature is termed as \_\_\_\_\_.
  - a) Elasticity
  - b) Isotropy
  - c) Hardness
  - d) Creep
- 4) Magnetic Particle Test can be done on \_\_\_\_\_.
  - a) Brass
  - b) Plain Carbon Steel
  - c) Bronze
  - d) Invar
- 5) For Annealing of hypereutectoid steels, they are heated in a range above \_\_\_\_\_.
  - a)  $910 \pm 50^\circ\text{C}$
  - b)  $273 + 50^\circ\text{C}$
  - c)  $551-770^\circ\text{C}$
  - d)  $723 \pm 50^\circ\text{C}$
- 6) The eutectic point in the iron-iron carbide phase diagram occurs at \_\_\_\_\_ weight % composition of carbon.
  - a) 0.022
  - b) 0.77
  - c) 2.11
  - d) 4.3
- 7) Which of the following properties are determined by impact test?
  - a) Relative Toughness
  - b) True Toughness
  - c) Elongation
  - d) Ductility
- 8) Which of the following NDT is fast method of testing?
  - a) DPT
  - b) MPT
  - c) Eddy Current
  - d) UT

- 9) Which of the following components are manufactured by Powder Metallurgy?
- |                     |                       |
|---------------------|-----------------------|
| a) Carbide tool tip | b) Piston             |
| c) Cermets          | d) Ball Bearing Balls |
- 10) How is cooling of the material done in normalising process?
- |              |                   |
|--------------|-------------------|
| a) Furnace   | b) Cooling tower  |
| c) Still air | d) Liquid chamber |
- 11) Phase transformation during hardening transforms \_\_\_\_.
- |               |               |
|---------------|---------------|
| a) BCC to FCC | b) FCC to BCT |
| c) BCT to HCP | d) FCC to HCP |
- 12) \_\_\_\_\_ is a eutectic mixture of  $\alpha$  iron and Fe<sub>3</sub>C..
- |               |               |
|---------------|---------------|
| a) Pearlite   | b) Martensite |
| c) Ledeburite | d) Sorbite    |
- 13) Which reaction does this equation denote?  
Liquid  $\rightarrow$  Solid 2 + Solid 1
- |              |                |
|--------------|----------------|
| a) Eutectic  | b) Peritectic  |
| c) Eutectoid | d) Peritectoid |
- 14) In which of the following test specimen is in the form of the simply supported beam?
- |                |                           |
|----------------|---------------------------|
| a) Izod test   | b) Rockwell hardness test |
| c) Charpy test | d) Brinell test           |

Seat No.	
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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
 2) Answer any two questions from Section I and Section II.  
 3) Figures to the right indicates full marks.

**Section – I**

- Q.2** a) Draw Fe-Fe<sub>3</sub>C equilibrium diagram. Label all the constituents and temperatures correctly. **06**  
 b) Explain the following terms in brief: **04**  
 1) Eutectic transformations  
 2) Curie Temperature  
 3) Alfa-Ferrite  
 4) Hypo Eutectoid Steel  
 c) Draw the microstructure of 0.4% C and 1.4% C Steel. **04**
- Q.3** a) Give typical composition, properties and application of any 5 of the following. **10**  
 1) HSLA  
 2) Naval Brass  
 3) HSS  
 4) Invar  
 5) Babbitt  
 6) Tool Steel  
 7) OHNS  
 b) Compare between Brasses and Bronzes. **04**
- Q.4** Write a note on any three of the following. **14**  
 a) Gibbs Phase Rule  
 b) Grey Cast Iron  
 c) Classification of Metallic Materials  
 d) Critical Temperatures in Iron-iron Carbide diagram  
 e) Nano Materials

**Section – II**

- Q.5** a) Draw T-T-T Diagram for eutectoid steel. **05**  
 b) What are the characteristics Martensitic Transformation? **05**  
 c) Explain different quenching media used in Heat Treatment. **04**
- Q.6** a) Compare between Annealing and Normalizing. **04**  
 b) Explain with sketch the advantages and limitations of Eddy Current Test. **05**  
 c) Discuss the manufacturing process of powder metallurgy product. **05**

- |            |           |   |           |
|------------|-----------|---|-----------|
| <b>Q.7</b> | <b>a)</b> | Draw Stress strain curve for mild steel and cast.             | <b>04</b> |
|            | <b>b)</b> | Draw flow chart for manufacture of self-lubricating bearings. | <b>04</b> |
|            | <b>c)</b> | Explain the process of tempering in details.                  | <b>03</b> |
|            | <b>d)</b> | Compare between Charpy & Izod Impact Test.                    | <b>03</b> |

<b>Seat No.</b>	
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- 10)** Only operation and inspection symbols are used in drawing \_\_\_\_\_.  
a) Operation process chart                      b) Flow process chart  
c) Multiple activity chart                        d) Travel chart
- 11)** The quantitative information is one which concerns the \_\_\_\_\_.  
a) value of some variable  
b) rate of change  
c) condition or status of system  
d) presence or absence of some specific object
- 12)** Fixed type layout is suitable for \_\_\_\_\_.  
a) Textile industry                                  b) Automobile industry  
c) Sugar industry                                  d) Ship industry
- 13)** Productivity can be increased by \_\_\_\_\_.  
a) Same production with increase in input  
b) Same production with decrease in output  
c) Increase in production without increase in input  
d) Increase in input as compared to output
- 14)** If Observed time is 10 min and performance rating is 150 then Normal time is \_\_\_\_\_.  
a) 10 min    b) 15 min  
c) 16.5 min    d) 25 min

Seat No.	
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P

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks.  
 4) Assume additional suitable data if necessary and state it clearly.

**Section – I**

- Q.2** a) What is productivity? Discuss the factors affecting productivity. **07**  
 b) Explain multiple activity chart. **07**
- Q.3** a) Define method study and explain the steps involved in method study. **07**  
 b) Describe ergonomic consideration at workplace. **07**
- Q.4** a) Explain two handed process chart. **06**  
 b) **Write short notes** **08**  
 1) Anthropometry  
 2) Flow diagram and string diagram

**Section – II**

- Q.5** a) Explain various types of layout. **07**  
 b) Explain various types of allowances. How to calculate the standard time? **07**
- Q.6** a) What is merit rating? List merit rating methods and explain any one in detail. **07**  
 b) Discuss the factors affecting plant location. **07**
- Q.7** a) Discuss work sampling method its need and procedure. **06**  
 b) **Write short note on (Any Two)** **08**  
 1) Principles and objectives of plant layout  
 2) Performance rating  
 3) Objectives of job evaluation and its procedure

<b>Seat No.</b>	
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- 9) One TMU = \_\_\_\_\_ minutes.
- |           |           |
|-----------|-----------|
| a) 0.001  | b) 0.006  |
| c) 0.0006 | d) 0.0001 |
- 10) Basic time + Allowances = \_\_\_\_\_.
- |                  |                  |
|------------------|------------------|
| a) Normal time   | b) Standard time |
| c) Observed time | d) Watch time    |
- 11) Average rating of a worker during time study is \_\_\_\_\_.
- |         |         |
|---------|---------|
| a) 50%  | b) 200% |
| c) 110% | d) 100% |
- 12) In method study, critical examination is done through \_\_\_\_\_.
- |                            |                            |
|----------------------------|----------------------------|
| a) Work sampling technique | b) Stop watch technique    |
| c) Questioning technique   | d) Multiple activity chart |
- 13) Merit Rating is used for \_\_\_\_\_.
- |   |  |
|---|--|
| a) Job analysis                           |  |
| b) Performance appraisal of the employees |  |
| c) Incentive scheme                       |  |
| d) Standard time calculation              |  |
- 14) Paired comparison method is a technique of \_\_\_\_\_.
- |                   |                  |
|-------------------|------------------|
| a) Job evaluation | b) Method study  |
| c) Merit Rating   | d) Work sampling |

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks.  
 4) Assume additional suitable data if necessary and state it clearly.


**Section – I**

- Q.2** a) What is productivity? Discuss the factors affecting productivity. **07**  
 b) Explain multiple activity chart. **07**
- Q.3** a) Define method study and explain the steps involved in method study. **07**  
 b) Describe ergonomic consideration at workplace. **07**
- Q.4** a) Explain two handed process chart. **06**  
 b) **Write short notes** **08**  
 1) Anthropometry  
 2) Flow diagram and string diagram

**Section – II**

- Q.5** a) Explain various types of layout. **07**  
 b) Explain various types of allowances. How to calculate the standard time? **07**
- Q.6** a) What is merit rating? List merit rating methods and explain any one in detail. **07**  
 b) Discuss the factors affecting plant location. **07**
- Q.7** a) Discuss work sampling method its need and procedure. **06**  
 b) **Write short note on (Any Two)** **08**  
 1) Principles and objectives of plant layout  
 2) Performance rating  
 3) Objectives of job evaluation and its procedure

Seat No.	
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- 9) In method study, critical examination is done through \_\_\_\_\_.  
a) Work sampling technique                      b) Stop watch technique  
c) Questioning technique                      d) Multiple activity chart
- 10) Merit Rating is used for \_\_\_\_\_.  
a) Job analysis  
b) Performance appraisal of the employees  
c) Incentive scheme  
d) Standard time calculation
- 11) Paired comparison method is a technique of \_\_\_\_\_.  
a) Job evaluation                      b) Method study  
c) Merit Rating                      d) Work sampling
- 12) The most frequently used components are arranged in \_\_\_\_\_.  
a) Left side                      b) Right side  
c) Central location                      d) Anywhere
- 13) Method study symbol  indicate \_\_\_\_\_.  
a) Storage                      b) Transportation  
c) Inspection                      d) Delay
- 14) Only operation and inspection symbols are used in drawing \_\_\_\_\_.  
a) Operation process chart                      b) Flow process chart  
c) Multiple activity chart                      d) Travel chart

Seat No.	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks.  
 4) Assume additional suitable data if necessary and state it clearly.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> What is productivity? Discuss the factors affecting productivity.   | <b>07</b> |
|            | <b>b)</b> Explain multiple activity chart.                                    | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Define method study and explain the steps involved in method study. | <b>07</b> |
|            | <b>b)</b> Describe ergonomic consideration at workplace.                      | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain two handed process chart.                                   | <b>06</b> |
|            | <b>b)</b> <b>Write short notes</b>  | <b>08</b> |
|            | 1) Anthropometry  |           |
|            | 2) Flow diagram and string diagram  |           |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> Explain various types of layout.   | <b>07</b> |
|            | <b>b)</b> Explain various types of allowances. How to calculate the standard time?       | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is merit rating? List merit rating methods and explain any one in detail. | <b>07</b> |
|            | <b>b)</b> Discuss the factors affecting plant location.                                  | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Discuss work sampling method its need and procedure.                           | <b>06</b> |
|            | <b>b)</b> <b>Write short note on (Any Two)</b>   | <b>08</b> |
|            | 1) Principles and objectives of plant layout   |           |
|            | 2) Performance rating  |           |
|            | 3) Objectives of job evaluation and its procedure  |           |



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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.


**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Merit Rating is used for \_\_\_\_\_.  
 a) Job analysis  
 b) Performance appraisal of the employees  
 c) Incentive scheme  
 d) Standard time calculation
- 2) Paired comparison method is a technique of \_\_\_\_\_.  
 a) Job evaluation  
 b) Method study  
 c) Merit Rating  
 d) Work sampling
- 3) The most frequently used components are arranged in \_\_\_\_\_.  
 a) Left side  
 b) Right side  
 c) Central location  
 d) Anywhere
- 4) Method study symbol  indicate \_\_\_\_\_.  
 a) Storage  
 b) Transportation  
 c) Inspection  
 d) Delay
- 5) Only operation and inspection symbols are used in drawing \_\_\_\_\_.  
 a) Operation process chart  
 b) Flow process chart  
 c) Multiple activity chart  
 d) Travel chart
- 6) The quantitative information is one which concerns the \_\_\_\_\_.  
 a) value of some variable  
 b) rate of change  
 c) condition or status of system  
 d) presence or absence of some specific object
- 7) Fixed type layout is suitable for \_\_\_\_\_.  
 a) Textile industry  
 b) Automobile industry  
 c) Sugar industry  
 d) Ship industry

- 8) Productivity can be increased by \_\_\_\_\_.  
a) Same production with increase in input  
b) Same production with decrease in output  
c) Increase in production without increase in input  
d) Increase in input as compared to output
- 9) If Observed time is 10 min and performance rating is 150 then Normal time is \_\_\_\_\_.  
a) 10 min  
b) 15 min  
c) 16.5 min  
d) 25 min
- 10) Which type of layout is used in automobile industry?  
a) Product  
b) Process  
c) Fixed  
d) Group
- 11) One TMU = \_\_\_\_\_ minutes.  
a) 0.001  
b) 0.006  
c) 0.0006  
d) 0.0001
- 12) Basic time + Allowances = \_\_\_\_\_.  
a) Normal time  
b) Standard time  
c) Observed time  
d) Watch time
- 13) Average rating of a worker during time study is \_\_\_\_\_.  
a) 50%  
b) 200%  
c) 110%  
d) 100%
- 14) In method study, critical examination is done through \_\_\_\_\_.  
a) Work sampling technique  
b) Stop watch technique  
c) Questioning technique  
d) Multiple activity chart

Seat No.	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks.  
 4) Assume additional suitable data if necessary and state it clearly.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> What is productivity? Discuss the factors affecting productivity.   | <b>07</b> |
|            | <b>b)</b> Explain multiple activity chart.                                    | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Define method study and explain the steps involved in method study. | <b>07</b> |
|            | <b>b)</b> Describe ergonomic consideration at workplace.                      | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain two handed process chart.                                   | <b>06</b> |
|            | <b>b)</b> <b>Write short notes</b>  | <b>08</b> |
|            | 1) Anthropometry  |           |
|            | 2) Flow diagram and string diagram  |           |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> Explain various types of layout.   | <b>07</b> |
|            | <b>b)</b> Explain various types of allowances. How to calculate the standard time?       | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is merit rating? List merit rating methods and explain any one in detail. | <b>07</b> |
|            | <b>b)</b> Discuss the factors affecting plant location.                                  | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Discuss work sampling method its need and procedure.                           | <b>06</b> |
|            | <b>b)</b> <b>Write short note on (Any Two)</b>   | <b>08</b> |
|            | 1) Principles and objectives of plant layout   |           |
|            | 2) Performance rating  |           |
|            | 3) Objectives of job evaluation and its procedure  |           |

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Set	P
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 02:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is defined as the time interval between the two successive grinds.
  - a) Machinability
  - b) Tool Wear
  - c) Tool Life
  - d) Machinability Index
- 2) Flank wear occurs mainly on the \_\_\_\_\_.
  - a) nose part of the cutting tool
  - b) front relief face and side relief face of the cutting tool
  - c) face of cutting tool at a short distance from the cutting edge
  - d) both (a) and (b)
- 3) Angle between the rake face and plane perpendicular to rake face is known as: \_\_\_\_\_.
  - a) Side rake angle
  - b) Side relief angle
  - c) End relief angle
  - d) Back rake angle
- 4) Which of the following will give better chip flow?
  - a) Negative back rake angle tool
  - b) Zero back rake angle tool
  - c) Positive back rake angle tool
  - d) None of the mentioned
- 5) The function of stripper is \_\_\_\_\_.
  - a) To strip of the material from the punch
  - b) Remove material from the punch
  - c) fixed the strip and punch
  - d) None of the above
- 6) In press tool Cutting Force is calculated by \_\_\_\_\_ where,  $\sigma_{sh}$  =shear strength.
  - a)  $(P \times t) / \sigma_{sh}$
  - b)  $P \times t \times \sigma_{sh}$
  - c)  $P / (t \times \sigma_{sh})$
  - d)  $(P \times \sigma_{sh}) / t$
- 7) Which of the following forming processes is suitable for making utensils and cup shaped objects?
  - a) Forging
  - b) Deep drawing
  - c) Rolling
  - d) Wire drawing



Seat No.	
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Set	P
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

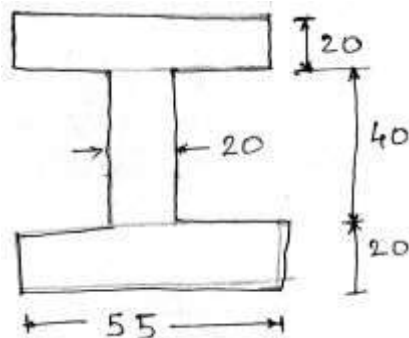
Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 02:00 PM

Max. Marks: 56

- Instructions:**
- 1) Q. 2 and Q. 6 are compulsory.
  - 2) Attempt any two question out of Q.No.3,4, and 5 from Section I
  - 3) Attempt any two question out of Q.No.7,8, and 9 from section II
  - 3) Figures to right indicate full marks.
  - 4) Make suitable assumptions, if required and state them clearly.

**Section – I**

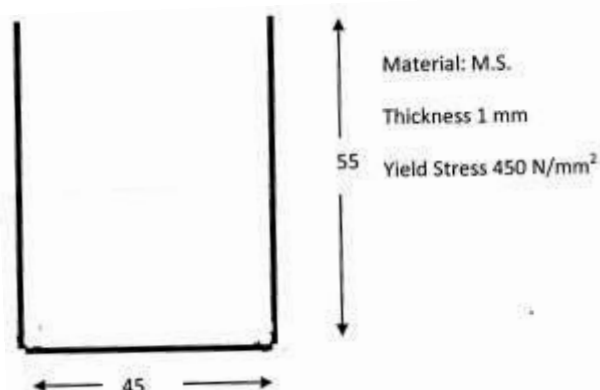
- Q.2 a)** Design press tool for the component shown in Fig. No. I and calculate the following and draw one sectional view of press tool. **14**
- 1) Cutting force
  - 2) Total clearance
  - 3) Strip layout
  - 4) Die thickness



Thickness = 6mm  
 $\sigma_s = 55 \text{ kg/mm}^2$

**OR**

- b)** Design a draw tool for given component Fig-II also calculate the following (draw 2 one sectional view of assembly) **14**
- 1) Blank size
  - 2) No of draws
  - 3) draw ratio
  - 4) Drawing force
  - 5) Blank force
  - 6) Die and punch clearance



- Q.3** a) The tool life equation for HSS tool is  $VT^{0.14}f^{0.7}d^{0.4} = \text{Constant}$ . The tool life (T) of 30 min is obtained using the following cutting conditions:  $V=45\text{m/min}$ ,  $f=0.35\text{ mm}$ ,  $d=2.0\text{ mm}$ . If speed (V), feed (f) and depth of cut (d) are increased individually by 25% find the tool life (in min). **04**
- b) What do you mean by Machinability and its index? **03**
- Q.4** a) In orthogonal turning of a cylindrical tube of wall thickness 5 mm, the axial and the tangential cutting forces were measured as 1259 N and 1601 N, respectively. The measured chip thickness after machining was found to be 0.3 mm. The rake angle was  $10^\circ$  and the axial feed was 100 mm/min. the rotational speed of the spindle was 1000 rpm. Find the shear strength of the material. **04**
- b) Differentiate between orthogonal and oblique cutting. **03**
- Q.5** Write a short note (Any Two). **07**
- Cutting Fluids
  - Types of chips
  - Press operations
  - Tool life

### Section - II

- Q.6** a) Design and draw a drilling jig for component shown in Fig-I below. Hole size  $\phi 10\text{mm} \times 2$  holes draw one sectional view. **14**

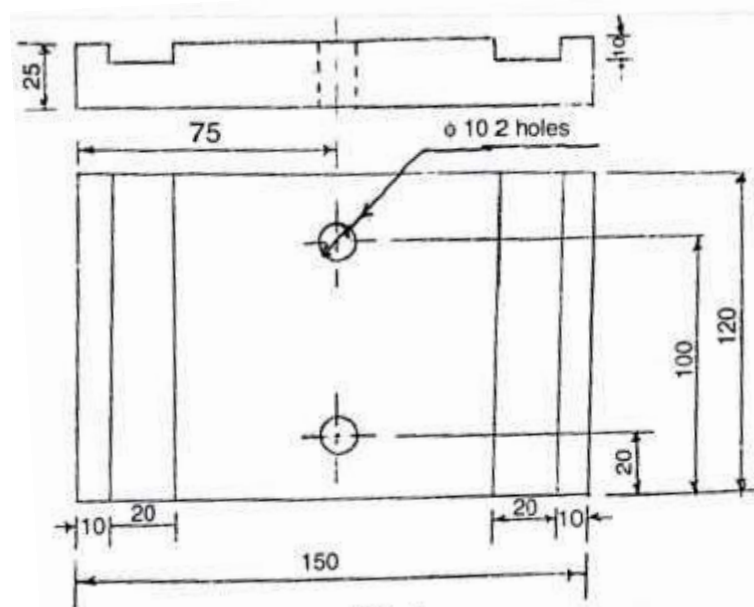


Fig - I

OR

- b) Design and draw a milling fixture for component shown in above Fig-I for milling slot  $20 \times 10$  draw one sectional view.
- Q.7** a) Explain in brief about Economic order quantity for batch production. **04**
- b) Explain break even analysis for equipment selection. **03**
- Q.8** a) Describe the nomenclature and geometry of single point cutting tool as per ASA system. **04**
- b) Explain 3-2-1 Principle. **03**

**Q.9 Write short notes on following (any two):**

- a)** Box type Jig
- b)** Fool proofing
- c)** Effect on tool geometry on tool life



**Seat  
No.**

**Set Q**

- 8) \_\_\_\_\_ is defined as the time interval between the two successive grinds.
- a) Machinability
  - b) Tool Wear
  - c) Tool Life
  - d) Machinability Index
- 9) Flank wear occurs mainly on the \_\_\_\_\_.
- a) nose part of the cutting tool
  - b) front relief face and side relief face of the cutting tool
  - c) face of cutting tool at a short distance from the cutting edge
  - d) both (a) and (b)
- 10) Angle between the rake face and plane perpendicular to rake face is known as: \_\_\_\_\_.
- a) Side rake angle
  - b) Side relief angle
  - c) End relief angle
  - d) Back rake angle
- 11) Which of the following will give better chip flow?
- a) Negative back rake angle tool
  - b) Zero back rake angle tool
  - c) Positive back rake angle tool
  - d) None of the mentioned
- 12) The function of stripper is \_\_\_\_\_.
- a) To strip of the material from the punch
  - b) Remove material from the punch
  - c) fixed the strip and punch
  - d) None of the above
- 13) In press tool Cutting Force is calculated by \_\_\_\_\_ where,  $\sigma_{sh}$  =shear strength.
- a)  $(Pxt)/\sigma_{sh}$
  - b)  $P \times t \times \sigma_{sh}$
  - c)  $P/(t \times \sigma_{sh})$
  - d)  $(P \times \sigma_{sh})/t$
- 14) Which of the following forming processes is suitable for making utensils and cup shaped objects?
- a) Forging
  - b) Deep drawing
  - c) Rolling
  - d) Wire drawing

Seat No.	
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Set **Q**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

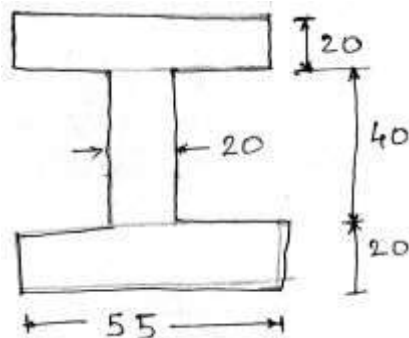
Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 02:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 2 and Q. 6 are compulsory.  
 2) Attempt any two question out of Q.No.3,4, and 5 from Section I  
 3) Attempt any two question out of Q.No.7,8, and 9 from section II  
 3) Figures to right indicate full marks.  
 4) Make suitable assumptions, if required and state them clearly.

**Section – I**

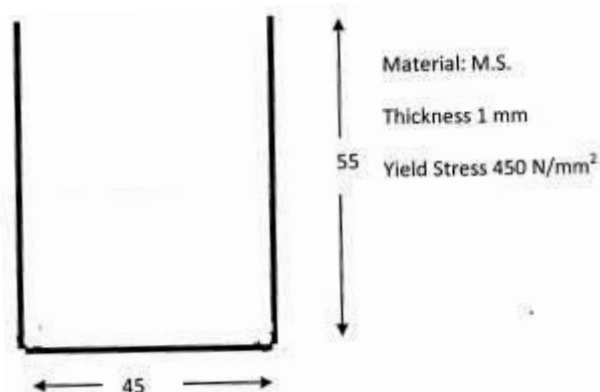
- Q.2 a)** Design press tool for the component shown in Fig. No. I and calculate the following and draw one sectional view of press tool. **14**
- 1) Cutting force
  - 2) Total clearance
  - 3) Strip layout
  - 4) Die thickness



Thickness = 6mm  
 $\sigma_s = 55 \text{ kg/mm}^2$

**OR**

- b)** Design a draw tool for given component Fig-II also calculate the following (draw 2 one sectional view of assembly) **14**
- 1) Blank size
  - 2) No of draws
  - 3) draw ratio
  - 4) Drawing force
  - 5) Blank force
  - 6) Die and punch clearance



- Q.3** a) The tool life equation for HSS tool is  $VT^{0.14}f^{0.7}d^{0.4} = \text{Constant}$ . The tool life (T) of 30 min is obtained using the following cutting conditions:  $V=45\text{m/min}$ ,  $f=0.35\text{ mm}$ ,  $d=2.0\text{ mm}$ . If speed (V), feed (f) and depth of cut (d) are increased individually by 25% find the tool life (in min). **04**
- b) What do you mean by Machinability and its index? **03**
- Q.4** a) In orthogonal turning of a cylindrical tube of wall thickness 5 mm, the axial and the tangential cutting forces were measured as 1259 N and 1601 N, respectively. The measured chip thickness after machining was found to be 0.3 mm. The rake angle was  $10^\circ$  and the axial feed was 100 mm/min. the rotational speed of the spindle was 1000 rpm. Find the shear strength of the material. **04**
- b) Differentiate between orthogonal and oblique cutting. **03**
- Q.5** Write a short note (Any Two). **07**
- Cutting Fluids
  - Types of chips
  - Press operations
  - Tool life

### Section - II

- Q.6** a) Design and draw a drilling jig for component shown in Fig-I below. Hole size  $\phi 10\text{mm} \times 2$  holes draw one sectional view. **14**

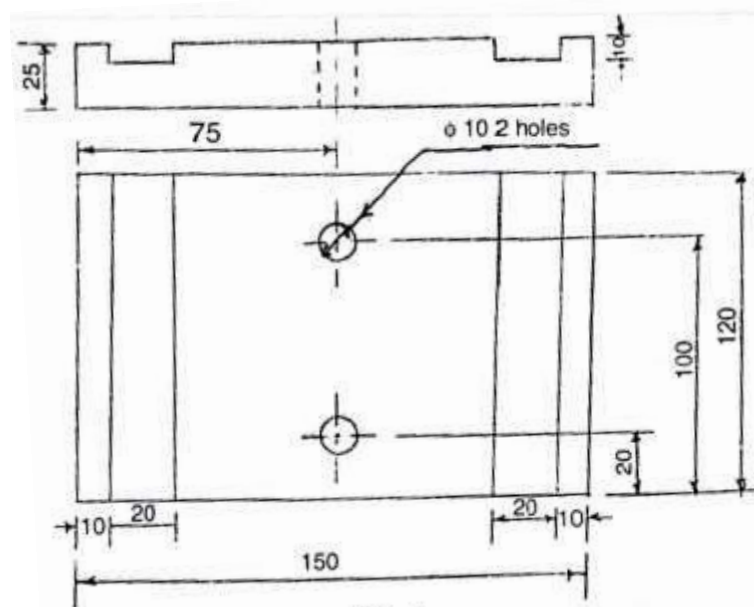


Fig - I

OR

- b) Design and draw a milling fixture for component shown in above Fig-I for milling slot  $20 \times 10$  draw one sectional view.
- Q.7** a) Explain in brief about Economic order quantity for batch production. **04**
- b) Explain break even analysis for equipment selection. **03**
- Q.8** a) Describe the nomenclature and geometry of single point cutting tool as per ASA system. **04**
- b) Explain 3-2-1 Principle. **03**

**Q.9 Write short notes on following (any two):**

- a)** Box type Jig
- b)** Fool proofing
- c)** Effect on tool geometry on tool life

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 02:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The use of jigs and fixtures \_\_\_\_\_.  
 a) Facilitates deployment of less skilled labor for production  
 b) Eliminates pre-machining operations like marking, measuring, laying out etc.  
 c) reduced manual handling operations  
 d) All of the above
- 2) The relationship between tool life (T) and cutting speed (V) m/min is given as \_\_\_\_\_.  
 a)  $V^n T = C$   
 b)  $V T^n = C$   
 c)  $V^n / T = C$   
 d)  $T^n / V = C$
- 3) Instrument which is used for measurement of cutting force in metal cutting \_\_\_\_\_.  
 a) Dynamometers  
 b) Merchants circle  
 c) Lee & shaffers theory  
 d) Speedometer
- 4) Draw ratio/Limiting draw ratio is represented as \_\_\_\_\_.  
 a)  $(D - d)/d$   
 b)  $D/d$   
 c)  $(D^2 - d^2)/d^2$   
 d)  $H/d$
- 5) \_\_\_\_\_ is defined as the time interval between the two successive grinds.  
 a) Machinability  
 b) Tool Wear  
 c) Tool Life  
 d) Machinability Index
- 6) Flank wear occurs mainly on the \_\_\_\_\_.  
 a) nose part of the cutting tool  
 b) front relief face and side relief face of the cutting tool  
 c) face of cutting tool at a short distance from the cutting edge  
 d) both (a) and (b)
- 7) Angle between the rake face and plane perpendicular to rake face is known as: \_\_\_\_\_.  
 a) Side rake angle  
 b) Side relief angle  
 c) End relief angle  
 d) Back rake angle

- 8) Which of the following will give better chip flow?  
a) Negative back rake angle tool    b) Zero back rake angle tool  
c) Positive back rake angle tool    d) None of the mentioned
- 9) The function of stripper is \_\_\_\_\_.  
a) To strip of the material from the punch  
b) Remove material from the punch  
c) fixed the strip and punch  
d) None of the above
- 10) In press tool Cutting Force is calculated by \_\_\_\_\_ where,  $\sigma_{sh}$  =shear strength.  
a)  $(Pxt)/\sigma_{sh}$     b)  $P \times t \times \sigma_{sh}$   
c)  $P/(t \times \sigma_{sh})$     d)  $(P \times \sigma_{sh})/t$
- 11) Which of the following forming processes is suitable for making utensils and cup shaped objects?  
a) Forging    b) Deep drawing  
c) Rolling    d) Wire drawing
- 12) The most common material for multipoint cutting tool is \_\_\_\_\_.  
a) Mild steel    b) HSS  
c) Stainless Steel    d) None of these
- 13) Chip thickness ratio is the ratio of \_\_\_\_\_.  
a)  $(\text{chip thickness after cut} + \text{before cut})/100$   
b) chip thickness after cut to before cut  
c) chip thickness before cut after cut  
d)  $(\text{chip thickness after cut} - \text{before cut})/100$
- 14) In an ASA system its tool signature is 8-15-6-7-10-10-3, the tool relief angle is \_\_\_\_\_.  
a) 8    b) 15  
c) 6    d) 7

Seat No.	
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Set **R**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

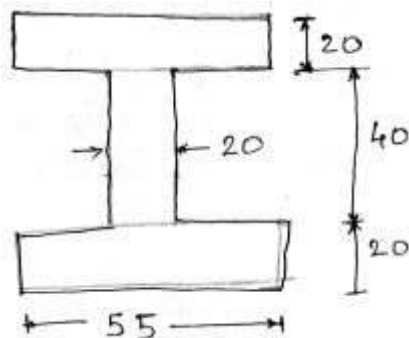
Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 02:00 PM

Max. Marks: 56

- Instructions:**
- 1) Q. 2 and Q. 6 are compulsory.
  - 2) Attempt any two question out of Q.No.3,4, and 5 from Section I
  - 3) Attempt any two question out of Q.No.7,8, and 9 from section II
  - 3) Figures to right indicate full marks.
  - 4) Make suitable assumptions, if required and state them clearly.

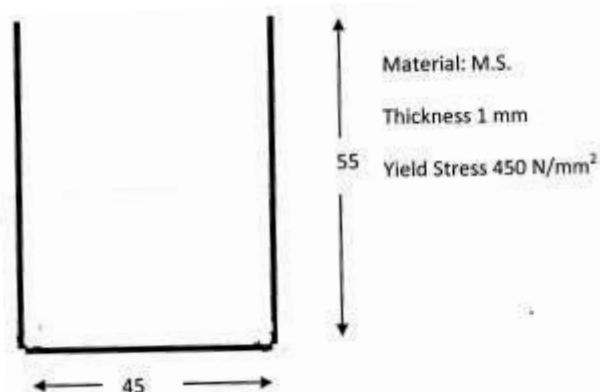
**Section – I**

- Q.2 a)** Design press tool for the component shown in Fig. No. I and calculate the following and draw one sectional view of press tool. **14**
- 1) Cutting force
  - 2) Total clearance
  - 3) Strip layout
  - 4) Die thickness



**OR**

- b)** Design a draw tool for given component Fig-II also calculate the following (draw 2 one sectional view of assembly) **14**
- 1) Blank size
  - 2) No of draws
  - 3) draw ratio
  - 4) Drawing force
  - 5) Blank force
  - 6) Die and punch clearance





- Q.3** a) The tool life equation for HSS tool is  $VT^{0.14}f^{0.7}d^{0.4} = \text{Constant}$ . The tool life (T) of 30 min is obtained using the following cutting conditions:  $V=45\text{m/min}$ ,  $f=0.35\text{ mm}$ ,  $d=2.0\text{ mm}$ . If speed (V), feed (f) and depth of cut (d) are increased individually by 25% find the tool life (in min). **04**
- b) What do you mean by Machinability and its index? **03**
- Q.4** a) In orthogonal turning of a cylindrical tube of wall thickness 5 mm, the axial and the tangential cutting forces were measured as 1259 N and 1601 N, respectively. The measured chip thickness after machining was found to be 0.3 mm. The rake angle was  $10^\circ$  and the axial feed was 100 mm/min. the rotational speed of the spindle was 1000 rpm. Find the shear strength of the material. **04**
- b) Differentiate between orthogonal and oblique cutting. **03**
- Q.5** Write a short note (Any Two). **07**
- Cutting Fluids
  - Types of chips
  - Press operations
  - Tool life

### Section - II

- Q.6** a) Design and draw a drilling jig for component shown in Fig-I below. Hole size  $\phi 10\text{mm} \times 2$  holes draw one sectional view. **14**

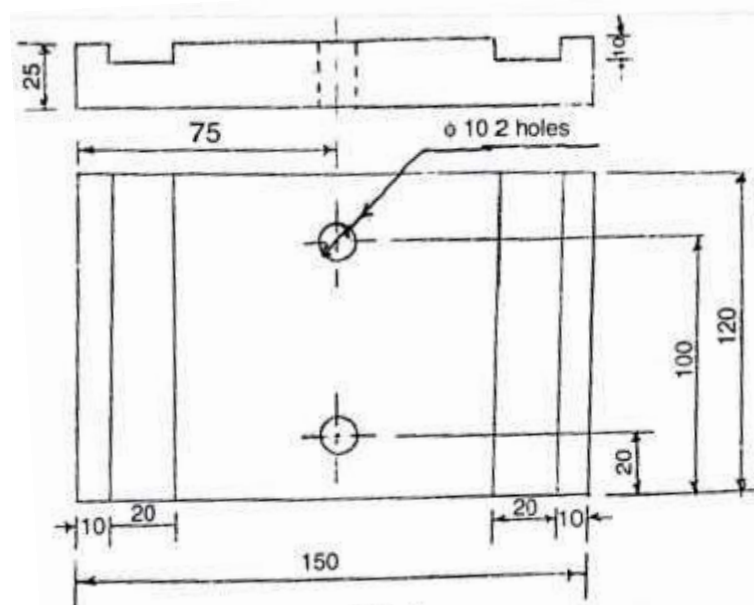


Fig - I

OR

- b) Design and draw a milling fixture for component shown in above Fig-I for milling slot  $20 \times 10$  draw one sectional view.
- Q.7** a) Explain in brief about Economic order quantity for batch production. **04**
- b) Explain break even analysis for equipment selection. **03**
- Q.8** a) Describe the nomenclature and geometry of single point cutting tool as per ASA system. **04**
- b) Explain 3-2-1 Principle. **03**

**Q.9 Write short notes on following (any two):**

- a)** Box type Jig
- b)** Fool proofing
- c)** Effect on tool geometry on tool life

Seat No.	
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Set	S
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 02:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) In press tool Cutting Force is calculated by \_\_\_\_\_ where,  $\sigma_{sh}$  = shear strength.
 

a) $(Pxt)/\sigma_{sh}$	b) $P \times t \times \sigma_{sh}$
c) $P/(t \times \sigma_{sh})$	d) $(P \times \sigma_{sh})/t$
- 2) Which of the following forming processes is suitable for making utensils and cup shaped objects?
 

a) Forging	b) Deep drawing
c) Rolling	d) Wire drawing
- 3) The most common material for multipoint cutting tool is \_\_\_\_\_.
 

a) Mild steel	b) HSS
c) Stainless Steel	d) None of these
- 4) Chip thickness ratio is the ratio of \_\_\_\_\_.
 

a) $(\text{chip thickness after cut} + \text{before cut})/100$
b) $\text{chip thickness after cut to before cut}$
c) $\text{chip thickness before cut after cut}$
d) $(\text{chip thickness after cut} - \text{before cut})/100$
- 5) In an ASA system its tool signature is 8-15-6-7-10-10-3, the tool relief angle is \_\_\_\_\_.
 

a) 8	b) 15
c) 6	d) 7
- 6) The use of jigs and fixtures \_\_\_\_\_.
 

a) Facilitates deployment of less skilled labor for production
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- 7) The relationship between tool life (T) and cutting speed (V) m/min is given as \_\_\_\_\_.
 

a) $V^n T = C$	b) $VT^n = C$
c) $V^n/T = C$	d) $T^n/V = C$

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  - a) Dynamometers
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  - a) To strip of the material from the punch
  - b) Remove material from the punch
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Seat No.	
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Set **S**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

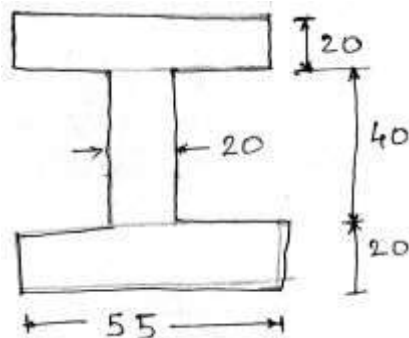
Day & Date: Thursday 09-02-2023  
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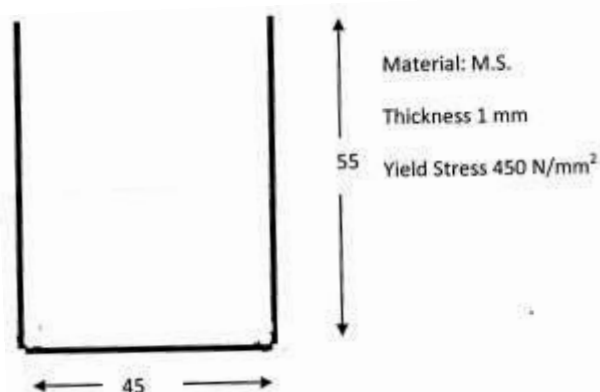
**Section – I**

- Q.2 a)** Design press tool for the component shown in Fig. No. I and calculate the following and draw one sectional view of press tool. **14**
- 1) Cutting force
  - 2) Total clearance
  - 3) Strip layout
  - 4) Die thickness



**OR**

- b)** Design a draw tool for given component Fig-II also calculate the following (draw 2 one sectional view of assembly) **14**
- 1) Blank size
  - 2) No of draws
  - 3) draw ratio
  - 4) Drawing force
  - 5) Blank force
  - 6) Die and punch clearance



- Q.3 a)** The tool life equation for HSS tool is  $VT^{0.14}f^{0.7}d^{0.4} = \text{Constant}$ . The tool life (T) of 30 min is obtained using the following cutting conditions:  $V=45\text{m/min}$ ,  $f=0.35\text{ mm}$ ,  $d=2.0\text{ mm}$ . If speed (V), feed (f) and depth of cut (d) are increased individually by 25% find the tool life (in min). **04**
- b)** What do you mean by Machinability and its index? **03**
- Q.4 a)** In orthogonal turning of a cylindrical tube of wall thickness 5 mm, the axial and the tangential cutting forces were measured as 1259 N and 1601 N, respectively. The measured chip thickness after machining was found to be 0.3 mm. The rake angle was  $10^\circ$  and the axial feed was 100 mm/min. the rotational speed of the spindle was 1000 rpm. Find the shear strength of the material. **04**
- b)** Differentiate between orthogonal and oblique cutting. **03**
- Q.5 Write a short note (Any Two).** **07**
- Cutting Fluids
  - Types of chips
  - Press operations
  - Tool life

**Section - II**

- Q.6 a)** Design and draw a drilling jig for component shown in Fig-I below. Hole size  $\phi 10\text{mm} \times 2$  holes draw one sectional view. **14**

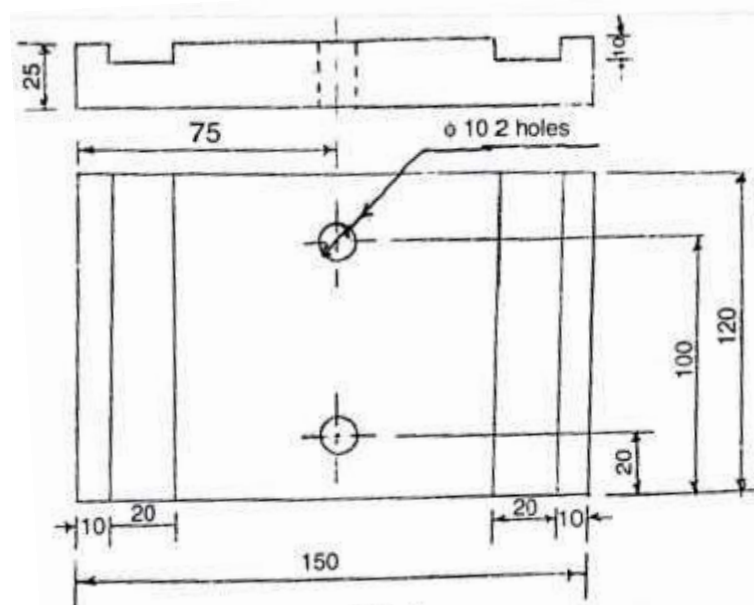


Fig - I

**OR**

- b)** Design and draw a milling fixture for component shown in above Fig-I for milling slot  $20 \times 10$  draw one sectional view.
- Q.7 a)** Explain in brief about Economic order quantity for batch production. **04**
- b)** Explain break even analysis for equipment selection. **03**
- Q.8 a)** Describe the nomenclature and geometry of single point cutting tool as per ASA system. **04**
- b)** Explain 3-2-1 Principle. **03**

**Q.9 Write short notes on following (any two):**

- a)** Box type Jig
- b)** Fool proofing
- c)** Effect on tool geometry on tool life

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022****MECHANICAL ENGINEERING****Industrial Hydraulics & Pneumatics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Telescopic cylinders have \_\_\_\_\_.
  - a) Only two stage units
  - b) Only three stage units
  - c) Multistage units
  - d) All of the above
- 2) Why are hydraulic cylinders cushioned?
  - a) Cushioning decelerates the piston of a cylinder
  - b) Stress and vibrations can be increased
  - c) Both a and b
  - d) None of the above
- 3) When the angle of swash plate decreases \_\_\_\_\_.
  - a) Flow rate increases
  - b) Flow rate decreases
  - c) Flow rate does not depend on swash plate angle
  - d) None of the above
- 4) Which stage in two stage direction control valve is solenoid operated?
  - a) Main stage direction control valve
  - b) Pilot stage direction control valve
  - c) Both stages in two stage direction control are solenoid operated
  - d) None of the above
- 5) Hydraulic accumulator is used for \_\_\_\_\_.
  - a) Accumulating oil
  - b) Supplying large quantities of oil for very short duration
  - c) Generally high pressures to operate hydraulic machines
  - d) Supplying energy when main supply fails
- 6) In Bleed-off circuit rate of flow of oil is controlled \_\_\_\_\_.
  - a) In the bypass line leading towards the tank
  - b) At inlet of the actuator
  - c) At outlet of the actuator
  - d) None of the above



- 7) In counter balancing circuit holding pressure is used to \_\_\_\_\_.  
a) To prevent falling of the load while descending  
b) To allow falling of the load while descending  
c) To prevent raising of the load while ascending  
d) All of the above
- 8) The regenerative circuit of a double - acting cylinder is used \_\_\_\_\_.  
a) To increase the out-stroke speed of piston  
b) To decrease the out-stroke speed of piston  
c) To increase the inward stroke speed of piston  
d) Both b & c
- 9) A pneumatic symbol is: \_\_\_\_\_.  
a) Different from a hydraulic part used for the same function  
b) The same as a hydraulic part used for the same function  
c) Not to be compared to a hydraulic part used for the same function  
d) All of above
- 10) How is reverse flow possible in pilot operated check valve?  
a) Spring force lifts the ball due to which reverse flow is possible  
b) Fluid pressure lifts the ball due to which reverse flow is possible  
c) Both a and b  
d) None of the above
- 11) Mostly Service unit (FRL) is \_\_\_\_\_.  
a) At outlet of compressor  
b) At inlet of the compressor  
c) Both a and b  
d) All of the above
- 12) A pressure relief valve can be \_\_\_\_\_.  
a) Direct operated  
b) Pilot operated  
c) Solenoid operated  
d) All the above
- 13) Time delay valve is \_\_\_\_\_.  
a) Pneumatic Pressure Control Valve  
b) Pneumatic Direction Control Valve  
c) Pneumatic Flow Control Valve  
d) Hydraulic Pressure Control Valve
- 14) Why the pilot operated check valve used in clamping operation?  
a) To reduce leakage in spool valve  
b) To avoid decrease in pressure during clamping  
c) Both a and b  
d) None of the above

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:**
- 1) All questions are compulsory.
  - 2) Figures to the right indicates full marks.
  - 3) Assume suitable data wherever needed and mention it clearly.
  - 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Solve any Four of the Followings. 16**

- a) Discuss the simple hydraulic system and write its applications.
- b) Explain with neat sketch construction and working of gear pump.
- c) State different types of accumulators. Explain gas loaded accumulator.
- d) Explain with neat sketch working of 4/2 direction control valve.
- e) Differentiate between meter in and meter out circuit.

**Q.3 Solve any two of the followings. 12**

- a) State different types of actuators. Explain in detail the telescopic cylinder.
- b) Explain construction and working of pilot operated pressure relief valve.
- c) Explain the hydraulic circuit for sequencing of two linear actuators.

**Section – II**

**Q.4 Solve any Four of the Followings. 16**

- a) State types of rotary actuators. Explain in detail vane motor.
- b) Write short note on air lubricator in FRL unit.
- c) How air compressor are classified. Discuss its selection criteria.
- d) Sketch and explain working of time delay valve with its symbol.
- e) Explain pneumatic braking system in automobiles.

**Q.5 Solve any two of the followings. 12**

- a) Discuss the working of quick exhaust valve with its application.
- b) Write short note on pneumatic power tools.
- c) Explain with neat sketch clamping circuit in pneumatics.

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The regenerative circuit of a double - acting cylinder is used \_\_\_\_\_.
  - a) To increase the out-stroke speed of piston
  - b) To decrease the out-stroke speed of piston
  - c) To increase the inward stroke speed of piston
  - d) Both b & c
- 2) A pneumatic symbol is: \_\_\_\_\_.
  - a) Different from a hydraulic part used for the same function
  - b) The same as a hydraulic part used for the same function
  - c) Not to be compared to a hydraulic part used for the same function
  - d) All of above
- 3) How is reverse flow possible in pilot operated check valve?
  - a) Spring force lifts the ball due to which reverse flow is possible
  - b) Fluid pressure lifts the ball due to which reverse flow is possible
  - c) Both a and b
  - d) None of the above
- 4) Mostly Service unit (FRL) is \_\_\_\_\_.
 

a) At outlet of compressor	b) At inlet of the compressor
c) Both a and b	d) All of the above
- 5) A pressure relief valve can be \_\_\_\_\_.
 

a) Direct operated	b) Pilot operated
c) Solenoid operated	d) All the above
- 6) Time delay valve is \_\_\_\_\_.
  - a) Pneumatic Pressure Control Valve
  - b) Pneumatic Direction Control Valve
  - c) Pneumatic Flow Control Valve
  - d) Hydraulic Pressure Control Valve

- 7) Why the pilot operated check valve used in clamping operation?
- a) To reduce leakage in spool valve
  - b) To avoid decrease in pressure during clamping
  - c) Both a and b
  - d) None of the above
- 8) Telescopic cylinders have \_\_\_\_\_.  
a) Only two stage units                      b) Only three stage units  
c) Multistage units                              d) All of the above
- 9) Why are hydraulic cylinders cushioned?
- a) Cushioning decelerates the piston of a cylinder
  - b) Stress and vibrations can be increased
  - c) Both a and b
  - d) None of the above
- 10) When the angle of swash plate decreases \_\_\_\_\_.  
a) Flow rate increases  
b) Flow rate decreases  
c) Flow rate does not depend on swash plate angle  
d) None of the above
- 11) Which stage in two stage direction control valve is solenoid operated?
- a) Main stage direction control valve
  - b) Pilot stage direction control valve
  - c) Both stages in two stage direction control are solenoid operated
  - d) None of the above
- 12) Hydraulic accumulator is used for \_\_\_\_\_.  
a) Accumulating oil  
b) Supplying large quantities of oil for very short duration  
c) Generally high pressures to operate hydraulic machines  
d) Supplying energy when main supply fails
- 13) In Bleed-off circuit rate of flow of oil is controlled \_\_\_\_\_.  
a) In the bypass line leading towards the tank  
b) At inlet of the actuator  
c) At outlet of the actuator  
d) None of the above
- 14) In counter balancing circuit holding pressure is used to \_\_\_\_\_.  
a) To prevent falling of the load while descending  
b) To allow falling of the load while descending  
c) To prevent raising of the load while ascending  
d) All of the above

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.  
3) Assume suitable data wherever needed and mention it clearly.  
4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 Solve any Four of the Followings. 16**
- a) Discuss the simple hydraulic system and write its applications.
  - b) Explain with neat sketch construction and working of gear pump.
  - c) State different types of accumulators. Explain gas loaded accumulator.
  - d) Explain with neat sketch working of 4/2 direction control valve.
  - e) Differentiate between meter in and meter out circuit.
- Q.3 Solve any two of the followings. 12**
- a) State different types of actuators. Explain in detail the telescopic cylinder.
  - b) Explain construction and working of pilot operated pressure relief valve.
  - c) Explain the hydraulic circuit for sequencing of two linear actuators.

**Section – II**

- Q.4 Solve any Four of the Followings. 16**
- a) State types of rotary actuators. Explain in detail vane motor.
  - b) Write short note on air lubricator in FRL unit.
  - c) How air compressor are classified. Discuss its selection criteria.
  - d) Sketch and explain working of time delay valve with its symbol.
  - e) Explain pneumatic braking system in automobiles.
- Q.5 Solve any two of the followings. 12**
- a) Discuss the working of quick exhaust valve with its application.
  - b) Write short note on pneumatic power tools.
  - c) Explain with neat sketch clamping circuit in pneumatics.

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022****MECHANICAL ENGINEERING****Industrial Hydraulics & Pneumatics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Mostly Service unit (FRL) is \_\_\_\_\_.
  - a) At outlet of compressor
  - b) At inlet of the compressor
  - c) Both a and b
  - d) All of the above
- 2) A pressure relief valve can be \_\_\_\_\_.
  - a) Direct operated
  - b) Pilot operated
  - c) Solenoid operated
  - d) All the above
- 3) Time delay valve is \_\_\_\_\_.
  - a) Pneumatic Pressure Control Valve
  - b) Pneumatic Direction Control Valve
  - c) Pneumatic Flow Control Valve
  - d) Hydraulic Pressure Control Valve
- 4) Why the pilot operated check valve used in clamping operation?
  - a) To reduce leakage in spool valve
  - b) To avoid decrease in pressure during clamping
  - c) Both a and b
  - d) None of the above
- 5) Telescopic cylinders have \_\_\_\_\_.
  - a) Only two stage units
  - b) Only three stage units
  - c) Multistage units
  - d) All of the above
- 6) Why are hydraulic cylinders cushioned?
  - a) Cushioning decelerates the piston of a cylinder
  - b) Stress and vibrations can be increased
  - c) Both a and b
  - d) None of the above
- 7) When the angle of swash plate decreases \_\_\_\_\_.
  - a) Flow rate increases
  - b) Flow rate decreases
  - c) Flow rate does not depend on swash plate angle
  - d) None of the above

- 8) Which stage in two stage direction control valve is solenoid operated?
- a) Main stage direction control valve
  - b) Pilot stage direction control valve
  - c) Both stages in two stage direction control are solenoid operated
  - d) None of the above
- 9) Hydraulic accumulator is used for \_\_\_\_\_.  
a) Accumulating oil  
b) Supplying large quantities of oil for very short duration  
c) Generally high pressures to operate hydraulic machines  
d) Supplying energy when main supply fails
- 10) In Bleed-off circuit rate of flow of oil is controlled \_\_\_\_\_.  
a) In the bypass line leading towards the tank  
b) At inlet of the actuator  
c) At outlet of the actuator  
d) None of the above
- 11) In counter balancing circuit holding pressure is used to \_\_\_\_\_.  
a) To prevent falling of the load while descending  
b) To allow falling of the load while descending  
c) To prevent raising of the load while ascending  
d) All of the above
- 12) The regenerative circuit of a double - acting cylinder is used \_\_\_\_\_.  
a) To increase the out-stroke speed of piston  
b) To decrease the out-stroke speed of piston  
c) To increase the inward stroke speed of piston  
d) Both b & c
- 13) A pneumatic symbol is: \_\_\_\_\_.  
a) Different from a hydraulic part used for the same function  
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c) Not to be compared to a hydraulic part used for the same function  
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- 14) How is reverse flow possible in pilot operated check valve?  
a) Spring force lifts the ball due to which reverse flow is possible  
b) Fluid pressure lifts the ball due to which reverse flow is possible  
c) Both a and b  
d) None of the above

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.  
3) Assume suitable data wherever needed and mention it clearly.  
4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 Solve any Four of the Followings. 16**
- a) Discuss the simple hydraulic system and write its applications.
  - b) Explain with neat sketch construction and working of gear pump.
  - c) State different types of accumulators. Explain gas loaded accumulator.
  - d) Explain with neat sketch working of 4/2 direction control valve.
  - e) Differentiate between meter in and meter out circuit.
- Q.3 Solve any two of the followings. 12**
- a) State different types of actuators. Explain in detail the telescopic cylinder.
  - b) Explain construction and working of pilot operated pressure relief valve.
  - c) Explain the hydraulic circuit for sequencing of two linear actuators.

**Section – II**

- Q.4 Solve any Four of the Followings. 16**
- a) State types of rotary actuators. Explain in detail vane motor.
  - b) Write short note on air lubricator in FRL unit.
  - c) How air compressor are classified. Discuss its selection criteria.
  - d) Sketch and explain working of time delay valve with its symbol.
  - e) Explain pneumatic braking system in automobiles.
- Q.5 Solve any two of the followings. 12**
- a) Discuss the working of quick exhaust valve with its application.
  - b) Write short note on pneumatic power tools.
  - c) Explain with neat sketch clamping circuit in pneumatics.



<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In Bleed-off circuit rate of flow of oil is controlled \_\_\_\_\_.
  - a) In the bypass line leading towards the tank
  - b) At inlet of the actuator
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  - d) None of the above
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  - a) To prevent falling of the load while descending
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  - d) Both b & c
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  - a) Different from a hydraulic part used for the same function
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  - a) Spring force lifts the ball due to which reverse flow is possible
  - b) Fluid pressure lifts the ball due to which reverse flow is possible
  - c) Both a and b
  - d) None of the above
- 6) Mostly Service unit (FRL) is \_\_\_\_\_.
  - a) At outlet of compressor
  - b) At inlet of the compressor
  - c) Both a and b
  - d) All of the above

- 7) A pressure relief valve can be \_\_\_\_\_.
  - a) Direct operated
  - b) Pilot operated
  - c) Solenoid operated
  - d) All the above
- 8) Time delay valve is \_\_\_\_\_.
  - a) Pneumatic Pressure Control Valve
  - b) Pneumatic Direction Control Valve
  - c) Pneumatic Flow Control Valve
  - d) Hydraulic Pressure Control Valve
- 9) Why the pilot operated check valve used in clamping operation?
  - a) To reduce leakage in spool valve
  - b) To avoid decrease in pressure during clamping
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  - d) None of the above
- 10) Telescopic cylinders have \_\_\_\_\_.
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  - c) Flow rate does not depend on swash plate angle
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  - b) Pilot stage direction control valve
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  - d) None of the above
- 14) Hydraulic accumulator is used for \_\_\_\_\_.
  - a) Accumulating oil
  - b) Supplying large quantities of oil for very short duration
  - c) Generally high pressures to operate hydraulic machines
  - d) Supplying energy when main supply fails

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.  
3) Assume suitable data wherever needed and mention it clearly.  
4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 Solve any Four of the Followings. 16**
- a) Discuss the simple hydraulic system and write its applications.
  - b) Explain with neat sketch construction and working of gear pump.
  - c) State different types of accumulators. Explain gas loaded accumulator.
  - d) Explain with neat sketch working of 4/2 direction control valve.
  - e) Differentiate between meter in and meter out circuit.
- Q.3 Solve any two of the followings. 12**
- a) State different types of actuators. Explain in detail the telescopic cylinder.
  - b) Explain construction and working of pilot operated pressure relief valve.
  - c) Explain the hydraulic circuit for sequencing of two linear actuators.

**Section – II**

- Q.4 Solve any Four of the Followings. 16**
- a) State types of rotary actuators. Explain in detail vane motor.
  - b) Write short note on air lubricator in FRL unit.
  - c) How air compressor are classified. Discuss its selection criteria.
  - d) Sketch and explain working of time delay valve with its symbol.
  - e) Explain pneumatic braking system in automobiles.
- Q.5 Solve any two of the followings. 12**
- a) Discuss the working of quick exhaust valve with its application.
  - b) Write short note on pneumatic power tools.
  - c) Explain with neat sketch clamping circuit in pneumatics.

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

## Marks:14

14

- Page 1 of 16

- 9) Charge to voltage converter for Individual pixel is employed in
  - a) CCD camera
  - b) CMOS camera
  - c) Vidicon Camera
  - d) None of the above
- 10) Bin picking application of robot involves
  - a) Identification and Servoing
  - b) Identification and inspection
  - c) Inspection and Servoing
  - d) None of the above
- 11) Seam tracking in continuous arc welding is an example of
  - a) Visual servoing and navigation
  - b) Inspection
  - c) Identification
  - d) Inspection and identification
- 12) The application in which the purpose of machine vision system is to recognize and classify an object is called
  - a) Inspection
  - b) Identification
  - c) Visual servoing and navigation
  - d) None of the above
- 13) The process of \_\_\_\_\_ is a technique which relates the location of pixels in the image array to the points in the scene.
  - a) Camera calibration
  - b) Camera orientation
  - c) Camera adaptation
  - d) Camera adjustment
- 14) The acronym AGV stands for
  - a) Automatic Guided Vehicle
  - b) Automated Guided Vehicle
  - c) Automated Gliding Vehicle
  - d) Automatic Gliding Vehicle

Seat No.	
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Set	P
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Machine Vision**

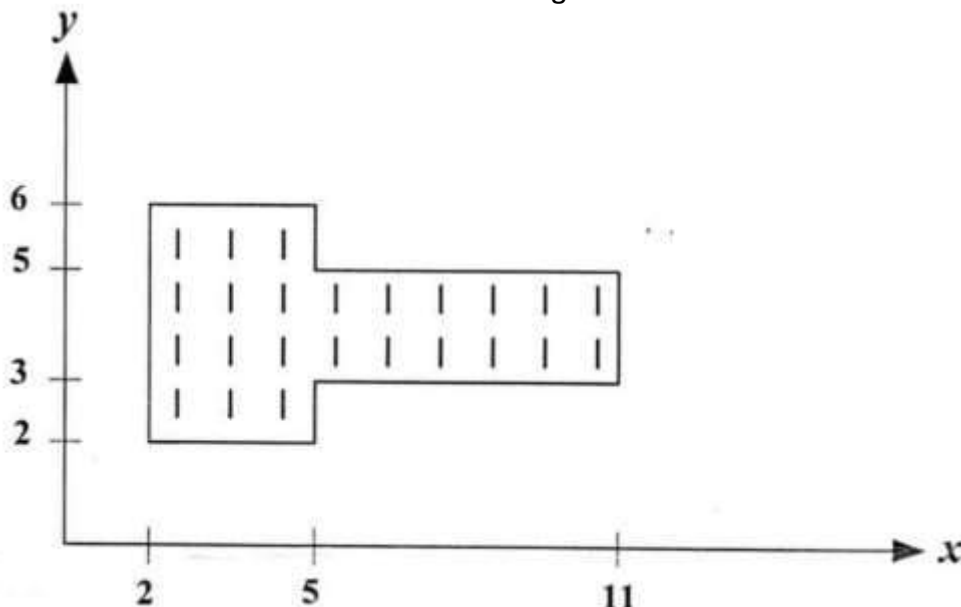
Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section I and Section II  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.  
 4) Use of non-programmable scientific calculator is allowed.

**Section – I**

- Q.2** a) With block diagram of Machine Vision system, state the objective of machine vision system. **07**  
 b) Explain with neat sketch successive approximation type AD converter. **07**
- Q.3** a) Define an edge in an image and explain the process of edge detection. **07**  
 b) Discuss in detail image thresholding. **07**
- Q.4** a) Determine the area, minimum aspect ratio, the diameter, perimeter, centroid and thinness measures of the image. **10**



- b) Why do we need image processing? Explain **04**

**Section – II**

- Q.5** a) Explain the working of Moravec corner detector. **07**  
 b) Draw neat sketch of CCD image sensor and explain its working. **07**
- Q.6** a) Discuss in detail about split and merge technique and region growing approach of segmentation. **08**  
 b) Explain in brief manual leadthrough and powered leadthrough robot programming methods. **06**

**Q.7 Write a short note on (Any Three)**

**14**

- a)** Inspection application of machine vision in robotics.
- b)** Visual servoing and navigation application of machine vision in robotics.
- c)** Template matching
- d)** Sampling and quantization

<b>Seat No.</b>	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Machine Vision**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In the context of camera, the term CMOS stands for
  - a) Camera Multiple Operating System
  - b) Complementary Metal Oxide Semiconductor
  - c) Closed Circuit Operating System
  - d) None of the above
- 2) Charge to voltage converter for Individual pixel is employed in
  - a) CCD camera
  - b) CMOS camera
  - c) Vidicon Camera
  - d) None of the above
- 3) Bin picking application of robot involves
  - a) Identification and Servoing
  - b) Identification and inspection
  - c) Inspection and Servoing
  - d) None of the above
- 4) Seam tracking in continuous arc welding is an example of
  - a) Visual servoing and navigation
  - b) Inspection
  - c) Identification
  - d) Inspection and identification
- 5) The application in which the purpose of machine vision system is to recognize and classify an object is called
  - a) Inspection
  - b) Identification
  - c) Visual servoing and navigation
  - d) None of the above
- 6) The process of \_\_\_\_\_ is a technique which relates the location of pixels in the image array to the points in the scene.
  - a) Camera calibration
  - b) Camera orientation
  - c) Camera adaptation
  - d) Camera adjustment
- 7) The acronym AGV stands for
  - a) Automatic Guided Vehicle
  - b) Automated Guided Vehicle
  - c) Automated Gliding Vehicle
  - d) Automatic Gliding Vehicle



- 8) An image which contains about 256 different intensity levels between black and white is a \_\_\_\_\_ image.
- a) Color
  - b) Binary
  - c) Grayscale
  - d) Monochrome
- 9) The two most commonly used image sensors in modern cameras are
- a) CCD and CDI
  - b) CCD and CMOS
  - c) CMOS and CDI
  - d) RGB and HSV
- 10) Zero crossing of gradient represents location of corner in an image.
- a) True
  - b) False
- 11) Silhouette is obtained with back light source.
- a) True
  - b) False
- 12) Which of the following operation involves plotting an image histogram?
- a) Corner detection
  - b) Thresholding
  - c) Region growing
  - d) None of the above
- 13) The process in which small part of image is compared with large image and located in large image, is called
- a) pattern recognition
  - b) template matching
  - c) region growing
  - d) split and merge technique
- 14) If path traced by end effector of robot arm is complex and continuous, then robot programming should be done by following approach
- a) manual leadthrouh
  - b) powered leadthrouh
  - c) textual programming method
  - d) None of the above

Seat No.	
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Set Q
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Machine Vision**

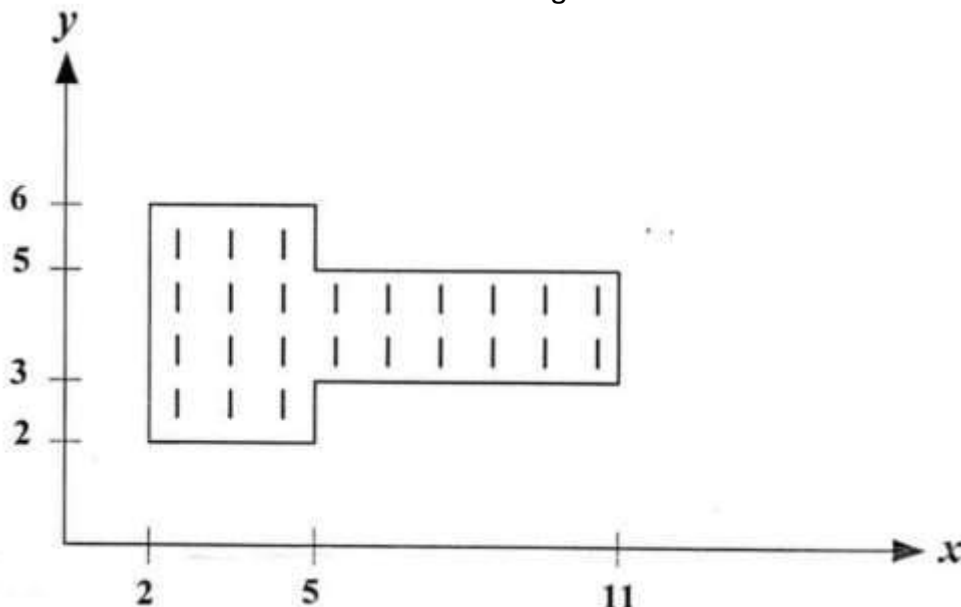
Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section I and Section II  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.  
 4) Use of non-programmable scientific calculator is allowed.

**Section – I**

- Q.2** a) With block diagram of Machine Vision system, state the objective of machine vision system. **07**  
 b) Explain with neat sketch successive approximation type AD converter. **07**
- Q.3** a) Define an edge in an image and explain the process of edge detection. **07**  
 b) Discuss in detail image thresholding. **07**
- Q.4** a) Determine the area, minimum aspect ratio, the diameter, perimeter, centroid and thinness measures of the image. **10**



- b) Why do we need image processing? Explain **04**

**Section – II**

- Q.5** a) Explain the working of Moravec corner detector. **07**  
 b) Draw neat sketch of CCD image sensor and explain its working. **07**
- Q.6** a) Discuss in detail about split and merge technique and region growing approach of segmentation. **08**  
 b) Explain in brief manual leadthrough and powered leadthrough robot programming methods. **06**

**Q.7 Write a short note on (Any Three)****14**

- a)** Inspection application of machine vision in robotics.
- b)** Visual servoing and navigation application of machine vision in robotics.
- c)** Template matching
- d)** Sampling and quantization

<b>Seat No.</b>	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Machine Vision**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Seam tracking in continuous arc welding is an example of
  - a) Visual servoing and navigation
  - b) Inspection
  - c) Identification
  - d) Inspection and identification
- 2) The application in which the purpose of machine vision system is to recognize and classify an object is called
  - a) Inspection
  - b) Identification
  - c) Visual servoing and navigation
  - d) None of the above
- 3) The process of \_\_\_\_\_ is a technique which relates the location of pixels in the image array to the points in the scene.
  - a) Camera calibration
  - b) Camera orientation
  - c) Camera adaptation
  - d) Camera adjustment
- 4) The acronym AGV stands for
  - a) Automatic Guided Vehicle
  - b) Automated Guided Vehicle
  - c) Automated Gliding Vehicle
  - d) Automatic Gliding Vehicle
- 5) An image which contains about 256 different intensity levels between black and white is a \_\_\_\_\_ image.
  - a) Color
  - b) Binary
  - c) Grayscale
  - d) Monochrome
- 6) The two most commonly used image sensors in modern cameras are
  - a) CCD and CDI
  - b) CCD and CMOS
  - c) CMOS and CDI
  - d) RGB and HSV
- 7) Zero crossing of gradient represents location of corner in an image.
  - a) True
  - b) False
- 8) Silhouette is obtained with back light source.
  - a) True
  - b) False

- 9) Which of the following operation involves plotting an image histogram?
- a) Corner detection
  - b) Thresholding
  - c) Region growing
  - d) None of the above
- 10) The process in which small part of image is compared with large image and located in large image, is called
- a) pattern recognition
  - b) template matching
  - c) region growing
  - d) split and merge technique
- 11) If path traced by end effector of robot arm is complex and continuous, then robot programming should be done by following approach
- a) manual leadthrouh
  - b) powered leadthrouh
  - c) textual programming method
  - d) None of the above
- 12) In the context of camera, the term CMOS stands for
- a) Camera Multiple Operating System
  - b) Complementary Metal Oxide Semiconductor
  - c) Closed Circuit Operating System
  - d) None of the above
- 13) Charge to voltage converter for Individual pixel is employed in
- a) CCD camera
  - b) CMOS camera
  - c) Vidicon Camera
  - d) None of the above
- 14) Bin picking application of robot involves
- a) Identification and Servoing
  - b) Identification and inspection
  - c) Inspection and Servoing
  - d) None of the above

Seat No.	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Machine Vision**

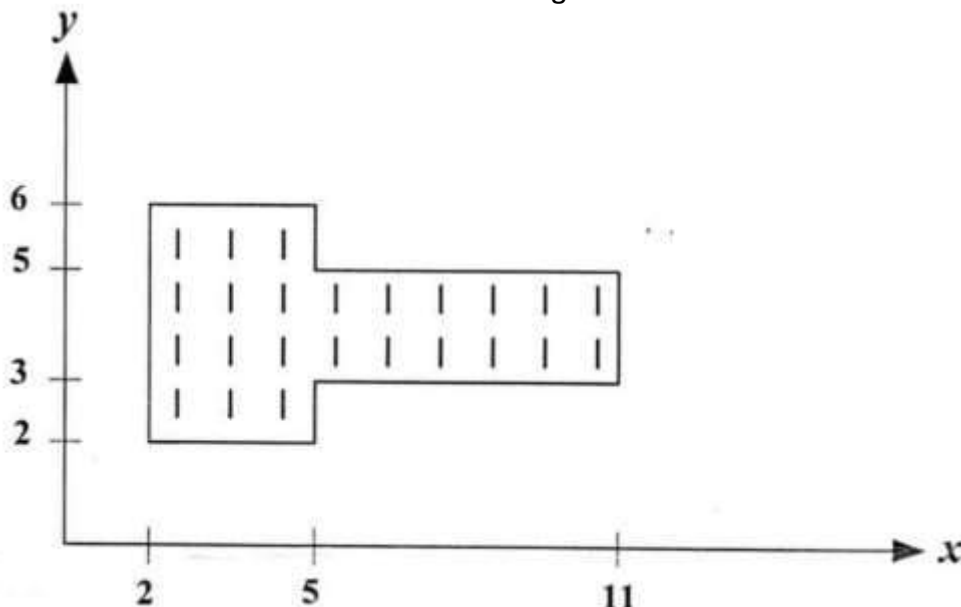
Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section I and Section II  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.  
 4) Use of non-programmable scientific calculator is allowed.

**Section – I**

- Q.2** a) With block diagram of Machine Vision system, state the objective of machine vision system. **07**  
 b) Explain with neat sketch successive approximation type AD converter. **07**
- Q.3** a) Define an edge in an image and explain the process of edge detection. **07**  
 b) Discuss in detail image thresholding. **07**
- Q.4** a) Determine the area, minimum aspect ratio, the diameter, perimeter, centroid and thinness measures of the image. **10**



- b) Why do we need image processing? Explain **04**

**Section – II**

- Q.5** a) Explain the working of Moravec corner detector. **07**  
 b) Draw neat sketch of CCD image sensor and explain its working. **07**
- Q.6** a) Discuss in detail about split and merge technique and region growing approach of segmentation. **08**  
 b) Explain in brief manual leadthrough and powered leadthrough robot programming methods. **06**

**Q.7 Write a short note on (Any Three)****14**

- a)** Inspection application of machine vision in robotics.
- b)** Visual servoing and navigation application of machine vision in robotics.
- c)** Template matching
- d)** Sampling and quantization

<b>Seat No.</b>	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Machine Vision**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) The process in which small part of image is compared with large image and located in large image, is called
  - a) pattern recognition
  - b) template matching
  - c) region growing
  - d) split and merge technique
- 2) If path traced by end effector of robot arm is complex and continuous, then robot programming should be done by following approach
  - a) manual leadthrouh
  - b) powered leadthrouh
  - c) textual programming method
  - d) None of the above
- 3) In the context of camera, the term CMOS stands for
  - a) Camera Multiple Operating System
  - b) Complementary Metal Oxide Semiconductor
  - c) Closed Circuit Operating System
  - d) None of the above
- 4) Charge to voltage converter for Individual pixel is employed in
  - a) CCD camera
  - b) CMOS camera
  - c) Vidicon Camera
  - d) None of the above
- 5) Bin picking application of robot involves
  - a) Identification and Servoing
  - b) Identification and inspection
  - c) Inspection and Servoing
  - d) None of the above
- 6) Seam tracking in continuous arc welding is an example of
  - a) Visual servoing and navigation
  - b) Inspection
  - c) Identification
  - d) Inspection and identification
- 7) The application in which the purpose of machine vision system is to recognize and classify an object is called
  - a) Inspection
  - b) Identification
  - c) Visual servoing and navigation
  - d) None of the above



- 8) The process of \_\_\_\_\_ is a technique which relates the location of pixels in the image array to the points in the scene.
- a) Camera calibration
  - b) Camera orientation
  - c) Camera adaptation
  - d) Camera adjustment
- 9) The acronym AGV stands for
- a) Automatic Guided Vehicle
  - b) Automated Guided Vehicle
  - c) Automated Gliding Vehicle
  - d) Automatic Gliding Vehicle
- 10) An image which contains about 256 different intensity levels between black and white is a \_\_\_\_\_ image.
- a) Color
  - b) Binary
  - c) Grayscale
  - d) Monochrome
- 11) The two most commonly used image sensors in modern cameras are
- a) CCD and CDI
  - b) CCD and CMOS
  - c) CMOS and CDI
  - d) RGB and HSV
- 12) Zero crossing of gradient represents location of corner in an image.
- a) True
  - b) False
- 13) Silhouette is obtained with back light source.
- a) True
  - b) False
- 14) Which of the following operation involves plotting an image histogram?
- a) Corner detection
  - b) Thresholding
  - c) Region growing
  - d) None of the above

Seat No.	
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Set **S**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Machine Vision**

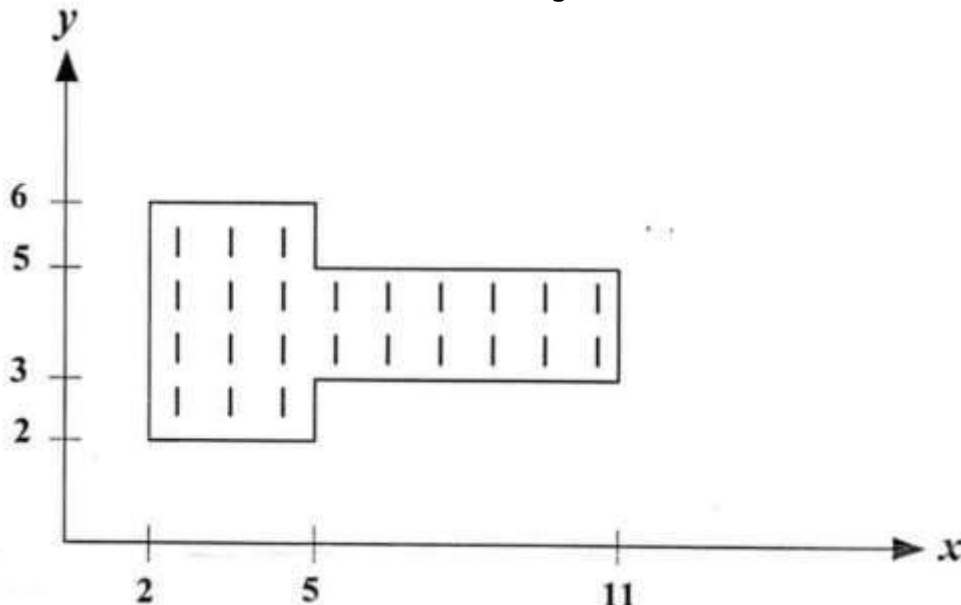
Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section I and Section II  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.  
 4) Use of non-programmable scientific calculator is allowed.

**Section – I**

- Q.2** a) With block diagram of Machine Vision system, state the objective of machine vision system. **07**  
 b) Explain with neat sketch successive approximation type AD converter. **07**
- Q.3** a) Define an edge in an image and explain the process of edge detection. **07**  
 b) Discuss in detail image thresholding. **07**
- Q.4** a) Determine the area, minimum aspect ratio, the diameter, perimeter, centroid and thinness measures of the image. **10**



- b) Why do we need image processing? Explain **04**

**Section – II**

- Q.5** a) Explain the working of Moravec corner detector. **07**  
 b) Draw neat sketch of CCD image sensor and explain its working. **07**
- Q.6** a) Discuss in detail about split and merge technique and region growing approach of segmentation. **08**  
 b) Explain in brief manual leadthrough and powered leadthrough robot programming methods. **06**

**Q.7 Write a short note on (Any Three)****14**

- a)** Inspection application of machine vision in robotics.
- b)** Visual servoing and navigation application of machine vision in robotics.
- c)** Template matching
- d)** Sampling and quantization

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**3D Printing Material**

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.
- 5) Use of scientific calculator is allowed.

Marks: 14

14

- 1) Which of the following is typically the most expensive type of 3D printer?  
a) SLA  
b) SLM  
c) FDM  
d) None of the above
- 2) What printer melts metal?  
a) SLS  
b) SLM  
c) SLA  
d) FDM
- 3) SLA printer's package material is in a \_\_\_\_\_.  
a) Chain  
b) Spool  
c) Cartridge  
d) None of the above
- 4) What material is not used in 3D printing?  
a) Nylon  
b) ABS  
c) PLA  
d) PVC
- 5) Which file type is most commonly exported from CAD software?  
a) SLDRT  
b) JPG  
c) STL  
d) X3G
- 6) Process of forming metal powder by directing molten metal through an orifice after which it is break into small particle using high pressure fluid is known as?  
a) Atomization  
b) Reduction  
c) Crushing  
d) Electrolysis
- 7) In Fused Deposition Modelling, the raw material is used in the form of \_\_\_\_\_.  
a) Wax  
b) Wire  
c) Powder  
d) All the above mentioned
- 8) In the process of Selective Laser Sintering, raw material used is in the form of \_\_\_\_\_.  
a) Machining Wax  
b) Foam Core  
c) Powder  
d) Rubber

- 9) What is the first step in the design process?
- a) Make a prototype
  - b) Identify the problem or the need
  - c) Market your idea
  - d) Test and retest
- 10) Choose the correct sequence to generate prototype.
- a) 3D CAD data - CAD solid model - STL file - RP prototype
  - b) CAD solid model - 3D CAD data - RP prototype - STL file
  - c) STL file - 3D CAD data - CAD solid model - RP prototype
  - d) 3D CAD data - STL file - CAD solid model - RP prototype
- 11) From following, the alternative name for Rapid Prototyping is \_\_\_\_\_.
- a) Additive Manufacturing
  - b) Layer Manufacturing
  - c) Direct CAD Manufacturing
  - d) All of the above
- 12) Process of converting STL file model in to layers is called \_\_\_\_\_ in RP.
- a) chopping
  - b) slicing
  - c) cutting
  - d) trimming
- 13) Full form of STL is \_\_\_\_\_.
- a) Straight-lithography
  - b) Streto-lithography
  - c) Stereo-lithography
  - d) Straight-lipsography
- 14) In the \_\_\_\_\_ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.
- a) Subtractive process
  - b) Additive process
  - c) Formative process
  - d) All of the above

<b>Seat No.</b>	
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**Set****P**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**3D Printing Material**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 1 is compulsory in section I, and solve any two questions from the remaining.  
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
2) Figures to the right indicate full marks.  
3) Assume suitable data wherever necessary and mention it clearly.  
4) Use of scientific calculator is allowed.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Discuss in detail the steps in 3D Printing.  | <b>10</b> |
| <b>Q.3</b> | Enlist the different Composite materials used in 3D Printing? Illustrate in detail types of Composite materials with their characteristics and applications. | <b>09</b> |
| <b>Q.4</b> | Compare Conventional Manufacturing Vs Additive Manufacturing.  | <b>09</b> |
| <b>Q.5</b> | Enlist different metal and alloy materials used in 3D Printer. Explain in detail applications and characteristics of any 03 metal and alloy materials.       | <b>09</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | Discuss various forms of raw material used in 3D Printing.   | <b>10</b> |
| <b>Q.7</b> | Enlist the different techniques to generate the powder. And explain with neat sketch Gas Atomization process.  | <b>09</b> |
| <b>Q.8</b> | Describe different application of 3D printing in the field of Medical, Aerospace and Automobile in detail.   | <b>09</b> |
| <b>Q.9</b> | What is meant by Performance Requirements in 3D printing? Discuss the significance of Performance Requirements to Material Requirements in 3D printing with example. | <b>09</b> |

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) In the process of Selective Laser Sintering, raw material used is in the form of \_\_\_\_\_.  
a) Machining Wax                      b) Foam Core  
c) Powder                                d) Rubber
- 2) What is the first step in the design process?  
a) Make a prototype                      b) Identify the problem or the need  
c) Market your idea                      d) Test and retest
- 3) Choose the correct sequence to generate prototype.  
a) 3D CAD data - CAD solid model - STL file - RP prototype  
b) CAD solid model - 3D CAD data - RP prototype - STL file  
c) STL file - 3D CAD data - CAD solid model - RP prototype  
d) 3D CAD data - STL file - CAD solid model - RP prototype
- 4) From following, the alternative name for Rapid Prototyping is \_\_\_\_\_.  
a) Additive Manufacturing              b) Layer Manufacturing  
c) Direct CAD Manufacturing          d) All of the above
- 5) Process of converting STL file model in to layers is called \_\_\_\_\_ in RP.  
a) chopping                                b) slicing  
c) cutting                                  d) trimming
- 6) Full form of STL is \_\_\_\_\_.  
a) Straight-lithography                  b) Streto-lithography  
c) Stereo-lithography                  d) Straight-lipsography
- 7) In the \_\_\_\_\_ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.  
a) Subtractive process                  b) Additive process  
c) Formative process                  d) All of the above

- 8) Which of the following is typically the most expensive type of 3D printer?  
a) SLA  
b) SLM  
c) FDM  
d) None of the above
- 9) What printer melts metal?  
a) SLS  
b) SLM  
c) SLA  
d) FDM
- 10) SLA printer's package material is in a \_\_\_\_\_.  
a) Chain  
b) Spool  
c) Cartridge  
d) None of the above
- 11) What material is not used in 3D printing?  
a) Nylon  
b) ABS  
c) PLA  
d) PVC
- 12) Which file type is most commonly exported from CAD software?  
a) SLDRT  
b) JPG  
c) STL  
d) X3G
- 13) Process of forming metal powder by directing molten metal through an orifice after which it is break into small particle using high pressure fluid is known as?  
a) Atomization  
b) Reduction  
c) Crushing  
d) Electrolysis
- 14) In Fused Deposition Modelling, the raw material is used in the form of \_\_\_\_\_.  
a) Wax  
b) Wire  
c) Powder  
d) All the above mentioned



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Set	Q
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**3D Printing Material**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 1 is compulsory in section I, and solve any two questions from the remaining.  
 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of scientific calculator is allowed.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Discuss in detail the steps in 3D Printing.  | <b>10</b> |
| <b>Q.3</b> | Enlist the different Composite materials used in 3D Printing? Illustrate in detail types of Composite materials with their characteristics and applications. | <b>09</b> |
| <b>Q.4</b> | Compare Conventional Manufacturing Vs Additive Manufacturing.  | <b>09</b> |
| <b>Q.5</b> | Enlist different metal and alloy materials used in 3D Printer. Explain in detail applications and characteristics of any 03 metal and alloy materials.       | <b>09</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | Discuss various forms of raw material used in 3D Printing.   | <b>10</b> |
| <b>Q.7</b> | Enlist the different techniques to generate the powder. And explain with neat sketch Gas Atomization process.  | <b>09</b> |
| <b>Q.8</b> | Describe different application of 3D printing in the field of Medical, Aerospace and Automobile in detail.   | <b>09</b> |
| <b>Q.9</b> | What is meant by Performance Requirements in 3D printing? Discuss the significance of Performance Requirements to Material Requirements in 3D printing with example. | <b>09</b> |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**3D Printing Material**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.
  - 5) Use of scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) From following, the alternative name for Rapid Prototyping is \_\_\_\_\_.  
 a) Additive Manufacturing                      b) Layer Manufacturing  
 c) Direct CAD Manufacturing                  d) All of the above
- 2) Process of converting STL file model in to layers is called \_\_\_\_\_ in RP.  
 a) chopping    b) slicing  
 c) cutting    d) trimming
- 3) Full form of STL is \_\_\_\_\_.  
 a) Straight-lithography                          b) Streto-lithography  
 c) Stereo-lithography                              d) Straight-lipsography
- 4) In the \_\_\_\_\_ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.  
 a) Subtractive process                              b) Additive process  
 c) Formative process                                d) All of the above
- 5) Which of the following is typically the most expensive type of 3D printer?  
 a) SLA    b) SLM  
 c) FDM    d) None of the above
- 6) What printer melts metal?  
 a) SLS    b) SLM  
 c) SLA    d) FDM
- 7) SLA printer's package material is in a \_\_\_\_\_.  
 a) Chain    b) Spool  
 c) Cartridge    d) None of the above
- 8) What material is not used in 3D printing?  
 a) Nylon    b) ABS  
 c) PLA    d) PVC

- 9) Which file type is most commonly exported from CAD software?
  - a) SLDRT
  - b) JPG
  - c) STL
  - d) X3G
- 10) Process of forming metal powder by directing molten metal through an orifice after which it is break into small particle using high pressure fluid is known as?
  - a) Atomization
  - b) Reduction
  - c) Crushing
  - d) Electrolysis
- 11) In Fused Deposition Modelling, the raw material is used in the form of \_\_\_\_\_.
  - a) Wax
  - b) Wire
  - c) Powder
  - d) All the above mentioned
- 12) In the process of Selective Laser Sintering, raw material used is in the form of \_\_\_\_\_.
  - a) Machining Wax
  - b) Foam Core
  - c) Powder
  - d) Rubber
- 13) What is the first step in the design process?
  - a) Make a prototype
  - b) Identify the problem or the need
  - c) Market your idea
  - d) Test and retest
- 14) Choose the correct sequence to generate prototype.
  - a) 3D CAD data - CAD solid model - STL file - RP prototype
  - b) CAD solid model - 3D CAD data - RP prototype - STL file
  - c) STL file - 3D CAD data - CAD solid model - RP prototype
  - d) 3D CAD data - STL file - CAD solid model - RP prototype

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**3D Printing Material**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 1 is compulsory in section I, and solve any two questions from the remaining.  
 2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of scientific calculator is allowed.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Discuss in detail the steps in 3D Printing.  | <b>10</b> |
| <b>Q.3</b> | Enlist the different Composite materials used in 3D Printing? Illustrate in detail types of Composite materials with their characteristics and applications. | <b>09</b> |
| <b>Q.4</b> | Compare Conventional Manufacturing Vs Additive Manufacturing.  | <b>09</b> |
| <b>Q.5</b> | Enlist different metal and alloy materials used in 3D Printer. Explain in detail applications and characteristics of any 03 metal and alloy materials.       | <b>09</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | Discuss various forms of raw material used in 3D Printing.   | <b>10</b> |
| <b>Q.7</b> | Enlist the different techniques to generate the powder. And explain with neat sketch Gas Atomization process.  | <b>09</b> |
| <b>Q.8</b> | Describe different application of 3D printing in the field of Medical, Aerospace and Automobile in detail.   | <b>09</b> |
| <b>Q.9</b> | What is meant by Performance Requirements in 3D printing? Discuss the significance of Performance Requirements to Material Requirements in 3D printing with example. | <b>09</b> |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**3D Printing Material**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.
  - 5) Use of scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Process of forming metal powder by directing molten metal through an orifice after which it is break into small particle using high pressure fluid is known as?
 

a) Atomization	b) Reduction
c) Crushing	d) Electrolysis
- 2) In Fused Deposition Modelling, the raw material is used in the form of \_\_\_\_\_.
 

a) Wax	b) Wire
c) Powder	d) All the above mentioned
- 3) In the process of Selective Laser Sintering, raw material used is in the form of \_\_\_\_\_.
 

a) Machining Wax	b) Foam Core
c) Powder	d) Rubber
- 4) What is the first step in the design process?
 

a) Make a prototype	b) Identify the problem or the need
c) Market your idea	d) Test and retest
- 5) Choose the correct sequence to generate prototype.
 

a) 3D CAD data - CAD solid model - STL file - RP prototype
b) CAD solid model - 3D CAD data - RP prototype - STL file
c) STL file - 3D CAD data - CAD solid model - RP prototype
d) 3D CAD data - STL file - CAD solid model - RP prototype
- 6) From following, the alternative name for Rapid Prototyping is \_\_\_\_\_.
 

a) Additive Manufacturing	b) Layer Manufacturing
c) Direct CAD Manufacturing	d) All of the above
- 7) Process of converting STL file model in to layers is called \_\_\_\_\_ in RP.
 

a) chopping	b) slicing
c) cutting	d) trimming

- 8) Full form of STL is \_\_\_\_\_.  
a) Straight-lithography                      b) Streto-lithography  
c) Stereo-lithography                      d) Straight-lipsography
- 9) In the \_\_\_\_\_ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.  
a) Subtractive process                      b) Additive process  
c) Formative process                      d) All of the above
- 10) Which of the following is typically the most expensive type of 3D printer?  
a) SLA    b) SLM  
c) FDM    d) None of the above
- 11) What printer melts metal?  
a) SLS    b) SLM  
c) SLA    d) FDM
- 12) SLA printer's package material is in a \_\_\_\_\_.  
a) Chain    b) Spool  
c) Cartridge    d) None of the above
- 13) What material is not used in 3D printing?  
a) Nylon    b) ABS  
c) PLA    d) PVC
- 14) Which file type is most commonly exported from CAD software?  
a) SLDRT    b) JPG  
c) STL    d) X3G

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**3D Printing Material**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 1 is compulsory in section I, and solve any two questions from the remaining.  
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
2) Figures to the right indicate full marks.  
3) Assume suitable data wherever necessary and mention it clearly.  
4) Use of scientific calculator is allowed.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Discuss in detail the steps in 3D Printing.  | <b>10</b> |
| <b>Q.3</b> | Enlist the different Composite materials used in 3D Printing? Illustrate in detail types of Composite materials with their characteristics and applications. | <b>09</b> |
| <b>Q.4</b> | Compare Conventional Manufacturing Vs Additive Manufacturing.  | <b>09</b> |
| <b>Q.5</b> | Enlist different metal and alloy materials used in 3D Printer. Explain in detail applications and characteristics of any 03 metal and alloy materials.       | <b>09</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | Discuss various forms of raw material used in 3D Printing.   | <b>10</b> |
| <b>Q.7</b> | Enlist the different techniques to generate the powder. And explain with neat sketch Gas Atomization process.  | <b>09</b> |
| <b>Q.8</b> | Describe different application of 3D printing in the field of Medical, Aerospace and Automobile in detail.   | <b>09</b> |
| <b>Q.9</b> | What is meant by Performance Requirements in 3D printing? Discuss the significance of Performance Requirements to Material Requirements in 3D printing with example. | <b>09</b> |

**Seat  
No.**

Set | P

## Energy Conservation, Audit and Management

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

### MCQ/Objective Type Questions

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Transfer of heat without a conveying medium is possible with \_\_\_\_\_.  
a) Conduction  
b) Radiation  
c) Convection  
d) None of the above
- 2) Fossile fuels are \_\_\_\_\_.  
a) Non-renewable source of energy  
b) Renewable source of energy  
c) Both a) and b)  
d) Neither a) and b)
- 3) World oil reserves are estimated to last over \_\_\_\_\_.  
a) 45 years  
b) 60 years  
c) 200 years  
d) 75 years
- 4) Energy consumption per unit of GDP is called as \_\_\_\_\_.  
a) Energy Ratio  
b) Energy intensity  
c) Per capita consumption  
d) None of the above
- 5) What is energy Science?  
a) Study of Energy  
b) Study of energy conversion  
c) Study of energy and its conversion in other forms  
d) Study of energy generation
- 6) Acid rain is caused by the release of the following components from combustion of fuels.  
a) SO<sub>x</sub> and NO<sub>x</sub>  
b) Sox and CO<sub>2</sub>  
c) CO<sub>2</sub> and NO<sub>x</sub>  
d) H<sub>2</sub>O
- 7) Energy manager should be well versed with \_\_\_\_\_.  
a) Manufacturing and processing skills  
b) Managerial and technical skills  
c) Technical and marketing skills  
d) Managerial and commercial skills



- 8) Which of the following is a good medium for constant temperature heating?  
a) Water  
b) Steam  
c) Coolant  
d) Diesel
- 9) The effectiveness of a heat exchanger depends on \_\_\_\_\_.  
a) Specific heat of hot fluid  
b) Specific heat of cold fluid  
c) Inlet temperature of hot fluid  
d) LMTD
- 10) Energy management is a key component of \_\_\_\_\_.  
a) Environmental management  
b) Carbon management  
c) Nitrogen management  
d) Water management
- 11) The Act which has been enacted to provide for efficient use of energy and its conservation and for matters connected therewith is?  
a) Indian Electricity Act 2003  
b) Energy Conservation Act 2001  
c) Indian Electricity Act 2010  
d) Energy Conservation Act 2007
- 12) Which of the following energy has the greatest potential among all the sources of renewable energy?  
a) Solar energy  
b) Wind Energy  
c) Thermal energy  
d) Hydro-electrical energy
- 13) \_\_\_\_\_ is called as the bio gas.  
a) Bio ethanol  
b) Bio methane  
c) Bio diesel  
d) Bio butane
- 14) Energy recovery is typically via production of \_\_\_\_\_.  
a) Gas  
b) Heat  
c) Light  
d) Steam

Seat No.	
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Set

P

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Energy Conservation, Audit and Management**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Attempt any two questions from each Section.  
 2) Assume suitable data if required.  
 3) Use of scientific calculator is allowed.

**Section – I**

- Q.2** a) What are the various types of energies? Explain each type in brief. **07**  
 b) Explain Current energy scenario in India. **07**
- Q.3** a) Explain detailed Energy Audit with its steps. **07**  
 b) Explain different instruments and equipments used for energy audit. **07**
- Q.4 Answer the following questions. (Any four)** **14**  
 a) Merits and demerits of Energy Management  
 b) Describe Energy and Environment.  
 c) Importance Energy Audit in Indian Industry  
 d) Explain Energy Policy Planning.  
 e) Four Principles of Energy Management

**Section – II**

- Q.5** a) Describe energy conservation opportunity HVAC system. **07**  
 b) Explain Energy performance assessment and efficiency improvement of Furnace. **07**
- Q.6** a) Explain Different Financial Analysis Techniques. **07**  
 b) What are the direct and indirect benefits of waste heat recovery? **07**
- Q.7 Answer the following questions. (Any four)** **14**  
 a) Concept of Waste heat recovery  
 b) NPV (Net Present Value) with formula  
 c) Energy conservation opportunity in Cooling Tower  
 d) Energy performance assessment and efficiency improvement of Boiler  
 e) Simple Payback Period

Seat No.	
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Set Q
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Energy Conservation, Audit and Management**

Day & Date: Thursday, 16-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is a good medium for constant temperature heating?
  - a) Water
  - b) Steam
  - c) Coolant
  - d) Diesel
- 2) The effectiveness of a heat exchanger depends on \_\_\_\_\_.
  - a) Specific heat of hot fluid
  - b) Specific heat of cold fluid
  - c) Inlet temperature of hot fluid
  - d) LMTD
- 3) Energy management is a key component of \_\_\_\_\_.
  - a) Environmental management
  - b) Carbon management
  - c) Nitrogen management
  - d) Water management
- 4) The Act which has been enacted to provide for efficient use of energy and its conservation and for matters connected therewith is?
  - a) Indian Electricity Act 2003
  - b) Energy Conservation Act 2001
  - c) Indian Electricity Act 2010
  - d) Energy Conservation Act 2007
- 5) Which of the following energy has the greatest potential among all the sources of renewable energy?
  - a) Solar energy
  - b) Wind Energy
  - c) Thermal energy
  - d) Hydro-electrical energy
- 6) \_\_\_\_\_ is called as the bio gas.
  - a) Bio ethanol
  - b) Bio methane
  - c) Bio diesel
  - d) Bio butane
- 7) Energy recovery is typically via production of \_\_\_\_\_.
  - a) Gas
  - b) Heat
  - c) Light
  - d) Steam
- 8) Transfer of heat without a conveying medium is possible with \_\_\_\_\_.
  - a) Conduction
  - b) Radiation
  - c) Convection
  - d) None of the above

- 9) Fossile fuels are \_\_\_\_\_.
  - a) Non-renewable source of energy
  - b) Renewable source of energy
  - c) Both a) and b)
  - d) Neither a) and b)
- 10) World oil reserves are estimated to last over \_\_\_\_\_.
  - a) 45 years
  - b) 60 years
  - c) 200 years
  - d) 75 years
- 11) Energy consumption per unit of GDP is called as \_\_\_\_\_.
  - a) Energy Ratio
  - b) Energy intensity
  - c) Per capita consumption
  - d) None of the above
- 12) What is energy Science?
  - a) Study of Energy
  - b) Study of energy conversion
  - c) Study of energy and its conversion in other forms
  - d) Study of energy generation
- 13) Acid rain is caused by the release of the following components from combustion of fuels.
  - a) SO<sub>x</sub> and NO<sub>x</sub>
  - b) SO<sub>x</sub> and CO<sub>2</sub>
  - c) CO<sub>2</sub> and NO<sub>x</sub>
  - d) H<sub>2</sub>O
- 14) Energy manager should be well versed with \_\_\_\_\_.
  - a) Manufacturing and processing skills
  - b) Managerial and technical skills
  - c) Technical and marketing skills
  - d) Managerial and commercial skills

Seat No.	
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Set Q
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Energy Conservation, Audit and Management**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Attempt any two questions from each Section.  
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**Section – I**

- Q.2** a) What are the various types of energies? Explain each type in brief. **07**  
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- Q.3** a) Explain detailed Energy Audit with its steps. **07**  
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- Q.4 Answer the following questions. (Any four)** **14**  
 a) Merits and demerits of Energy Management  
 b) Describe Energy and Environment.  
 c) Importance Energy Audit in Indian Industry  
 d) Explain Energy Policy Planning.  
 e) Four Principles of Energy Management

**Section – II**

- Q.5** a) Describe energy conservation opportunity HVAC system. **07**  
 b) Explain Energy performance assessment and efficiency improvement of Furnace. **07**
- Q.6** a) Explain Different Financial Analysis Techniques. **07**  
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- Q.7 Answer the following questions. (Any four)** **14**  
 a) Concept of Waste heat recovery  
 b) NPV (Net Present Value) with formula  
 c) Energy conservation opportunity in Cooling Tower  
 d) Energy performance assessment and efficiency improvement of Boiler  
 e) Simple Payback Period

Seat No.	
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Set 

R
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Energy Conservation, Audit and Management**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The Act which has been enacted to provide for efficient use of energy and its conservation and for matters connected therewith is?
 

a) Indian Electricity Act 2003	b) Energy Conservation Act 2001
c) Indian Electricity Act 2010	d) Energy Conservation Act 2007
- 2) Which of the following energy has the greatest potential among all the sources of renewable energy?
 

a) Solar energy	b) Wind Energy
c) Thermal energy	d) Hydro-electrical energy
- 3) \_\_\_\_\_ is called as the bio gas.
 

a) Bio ethanol	b) Bio methane
c) Bio diesel	d) Bio butane
- 4) Energy recovery is typically via production of \_\_\_\_\_.
 

a) Gas	b) Heat
c) Light	d) Steam
- 5) Transfer of heat without a conveying medium is possible with \_\_\_\_\_.
 

a) Conduction	b) Radiation
c) Convection	d) None of the above
- 6) Fossile fuels are \_\_\_\_\_.
 

a) Non-renewable source of energy
b) Renewable source of energy
c) Both a) and b)
d) Neither a) and b)
- 7) World oil reserves are estimated to last over \_\_\_\_\_.
 

a) 45 years	b) 60 years
c) 200 years	d) 75 years
- 8) Energy consumption per unit of GDP is called as \_\_\_\_\_.
 

a) Energy Ratio	b) Energy intensity
c) Per capita consumption	d) None of the above

- 9) What is energy Science?
- a) Study of Energy
  - b) Study of energy conversion
  - c) Study of energy and its conversion in other forms
  - d) Study of energy generation
- 10) Acid rain is caused by the release of the following components from combustion of fuels.
- a) SO<sub>x</sub> and NO<sub>x</sub>
  - b) SO<sub>x</sub> and CO<sub>2</sub>
  - c) CO<sub>2</sub> and NO<sub>x</sub>
  - d) H<sub>2</sub>O
- 11) Energy manager should be well versed with \_\_\_\_\_.
- a) Manufacturing and processing skills
  - b) Managerial and technical skills
  - c) Technical and marketing skills
  - d) Managerial and commercial skills
- 12) Which of the following is a good medium for constant temperature heating?
- a) Water
  - b) Steam
  - c) Coolant
  - d) Diesel
- 12) The effectiveness of a heat exchanger depends on \_\_\_\_\_.
- a) Specific heat of hot fluid
  - b) Specific heat of cold fluid
  - c) Inlet temperature of hot fluid
  - d) LMTD
- 14) Energy management is a key component of \_\_\_\_\_.
- a) Environmental management
  - b) Carbon management
  - c) Nitrogen management
  - d) Water management

Seat No.	
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Set	R
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Energy Conservation, Audit and Management**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Attempt any two questions from each Section.  
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**Section – I**

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**Section – II**

- Q.5** a) Describe energy conservation opportunity HVAC system. **07**  
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 c) Energy conservation opportunity in Cooling Tower  
 d) Energy performance assessment and efficiency improvement of Boiler  
 e) Simple Payback Period



Seat No.	
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Set	S
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Energy Conservation, Audit and Management**

Day & Date: Thursday, 16-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Acid rain is caused by the release of the following components from combustion of fuels.
 

a) SO <sub>x</sub> and NO <sub>x</sub>	b) Sox and CO <sub>2</sub>
c) CO <sub>2</sub> and NO <sub>x</sub>	d) H <sub>2</sub> O
- 2) Energy manager should be well versed with \_\_\_\_\_.
 

a) Manufacturing and processing skills
b) Managerial and technical skills
c) Technical and marketing skills
d) Managerial and commercial skills
- 3) Which of the following is a good medium for constant temperature heating?
 

a) Water	b) Steam
c) Coolant	d) Diesel
- 4) The effectiveness of a heat exchanger depends on \_\_\_\_\_.
 

a) Specific heat of hot fluid	b) Specific heat of cold fluid
c) Inlet temperature of hot fluid	d) LMTD
- 5) Energy management is a key component of \_\_\_\_\_.
 

a) Environmental management	b) Carbon management
c) Nitrogen management	d) Water management
- 6) The Act which has been enacted to provide for efficient use of energy and its conservation and for matters connected therewith is?
 

a) Indian Electricity Act 2003	b) Energy Conservation Act 2001
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- 9) Energy recovery is typically via production of \_\_\_\_\_.
  - a) Gas
  - b) Heat
  - c) Light
  - d) Steam
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  - a) Conduction
  - b) Radiation
  - c) Convection
  - d) None of the above
- 11) Fossile fuels are \_\_\_\_\_.
  - a) Non-renewable source of energy
  - b) Renewable source of energy
  - c) Both a) and b)
  - d) Neither a) and b)
- 12) World oil reserves are estimated to last over \_\_\_\_\_.
  - a) 45 years
  - b) 60 years
  - c) 200 years
  - d) 75 years
- 13) Energy consumption per unit of GDP is called as \_\_\_\_\_.
  - a) Energy Ratio
  - b) Energy intensity
  - c) Per capita consumption
  - d) None of the above
- 14) What is energy Science?
  - a) Study of Energy
  - b) Study of energy conversion
  - c) Study of energy and its conversion in other forms
  - d) Study of energy generation

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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Energy Conservation, Audit and Management**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Attempt any two questions from each Section.  
 2) Assume suitable data if required.  
 3) Use of scientific calculator is allowed.

**Section – I**

- Q.2** a) What are the various types of energies? Explain each type in brief. **07**  
 b) Explain Current energy scenario in India. **07**
- Q.3** a) Explain detailed Energy Audit with its steps. **07**  
 b) Explain different instruments and equipments used for energy audit. **07**
- Q.4 Answer the following questions. (Any four)** **14**  
 a) Merits and demerits of Energy Management  
 b) Describe Energy and Environment.  
 c) Importance Energy Audit in Indian Industry  
 d) Explain Energy Policy Planning.  
 e) Four Principles of Energy Management

**Section – II**

- Q.5** a) Describe energy conservation opportunity HVAC system. **07**  
 b) Explain Energy performance assessment and efficiency improvement of Furnace. **07**
- Q.6** a) Explain Different Financial Analysis Techniques. **07**  
 b) What are the direct and indirect benefits of waste heat recovery? **07**
- Q.7 Answer the following questions. (Any four)** **14**  
 a) Concept of Waste heat recovery  
 b) NPV (Net Present Value) with formula  
 c) Energy conservation opportunity in Cooling Tower  
 d) Energy performance assessment and efficiency improvement of Boiler  
 e) Simple Payback Period

<b>Seat No.</b>	
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# Introduction to Electric and Hybrid Vehicles

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Full form of EV is \_\_\_\_\_.  
a) Energy voltage                      b) Electric vehicles  
c) Electric voltage                  d) Energy vehicles
- 2) Full form of ICV is \_\_\_\_\_.  
a) Internal combustion vehicles    b) Internet combustion vehicles  
c) Internally combined vehicles    d) Internet combined vehicles
- 3) What's the difference between a plug-in hybrid and a battery electric vehicle?  
a) There is no difference  
b) A plug-in hybrid only accepts AC power, while a battery electric vehicle accepts AC and DC power  
c) A plug-in hybrid can be powered by either the battery or the gasoline engine. A pure electric vehicle is powered only by the battery  
d) None of the above
- 4) The performance of a vehicle is usually described by \_\_\_\_\_.  
a) Its maximum cruising speed      b) Grade-ability  
c) Acceleration                        d) All of the above
- 5) Which of the following is NOT the type of Hybrid Vehicle?  
a) Plug-in Hybrid                      b) Parallel Hybrid  
c) Natural Gas for Vehicles          d) Series Hybrid
- 6) The transmission requirements of a vehicle depend on the characteristics of \_\_\_\_\_.  
a) The power plant  
b) The performance requirements of the vehicle  
c) The power plant and the performance requirements of the vehicle  
d) None of the above
- 7) Which type of motor is widely used for electric vehicle?  
a) Induction motor                      b) DC shunt motor  
c) BLDC                                    d) Series motor

- 8) Speed of D.C. shunt motors are controlled by \_\_\_\_\_.  
a) Flux control method                      b) Rheostatic control method  
c) Voltage control method                  d) All of these
- 9) In a series-switched hybrid \_\_\_\_\_.  
a) Is the weakest engine in series with the wheels  
b) The engines simultaneously drive the front and the rear axle  
c) Is the strongest engine in series with the wheels  
d) Goes the power through a succession of motors to the wheels
- 10) Electric Vehicles are generally powered by \_\_\_\_\_.  
a) Aluminum batteries                      b) Lead-acid batteries  
c) Sodium batteries                        d) Magnesium batteries
- 11) Full form of HVDC is \_\_\_\_\_.  
a) High Voltage Direct Current  
b) High Voltage Distribution Combination  
c) High Value Direct Current  
d) High Value Distribution Combination
- 12) Full form of EMU is \_\_\_\_\_.  
a) Electronics Multiple Unit              b) Electrical Multiple Unit  
c) Electrical Multiple Usage              d) Electrical Multiple User
- 13) The electric motor in a hybrid car can also act as: \_\_\_\_\_.  
a) Cooling fan                                b) Fuel pump  
c) Generator                                  d) None of these
- 14) The value of area under acceleration-time graph is \_\_\_\_\_.  
a) Velocity                                      b) Displacement  
c) Force                                         d) Impulse

Seat No.	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Introduction to Electric and Hybrid Vehicles**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Attempt any two questions from each section.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Discuss the concept of Range Extender Battery.                      | <b>07</b> |
|            | <b>b)</b> Explain in short History of Electric Vehicles.                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Describe Electric Motor characteristics.                            | <b>07</b> |
|            | <b>b)</b> Discuss in detail strategy for battery cost reduction.              | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain with neat sketch Series and Parallel hybrid electric drive. | <b>07</b> |
|            | <b>b)</b> Write a note on concept of hybrid electric drive.                   | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Describe with neat sketch construction & working of AC Induction motor.         | <b>07</b> |
|            | <b>b)</b> What is SRM Motor? State advantages & disadvantages of SRM Motors.              | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is Chopper? Discuss with neat sketch its working advantages & limitations. | <b>07</b> |
|            | <b>b)</b> What is VFD? Discuss each section of VFD with neat sketch in detail.            | <b>07</b> |
| <b>Q.7</b> | <b>a) Define the following terms.</b>   | <b>08</b> |
|            | 1) Energy efficiency  |           |
|            | 2) Idling   |           |
|            | 3) Deceleration   |           |
|            | 4) Regeneration Efficiency  |           |
|            | <b>b)</b> What is Drive Cycle? Discuss any one case of drive cycle in detail.             | <b>06</b> |

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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Introduction to Electric and Hybrid Vehicles**

Day & Date: Thursday, 16-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Speed of D.C. shunt motors are controlled by \_\_\_\_\_.  
 a) Flux control method                      b) Rheostatic control method  
 c) Voltage control method                  d) All of these
- 2) In a series-switched hybrid \_\_\_\_\_.  
 a) Is the weakest engine in series with the wheels  
 b) The engines simultaneously drive the front and the rear axle  
 c) Is the strongest engine in series with the wheels  
 d) Goes the power through a succession of motors to the wheels
- 3) Electric Vehicles are generally powered by \_\_\_\_\_.  
 a) Aluminum batteries                      b) Lead-acid batteries  
 c) Sodium batteries                          d) Magnesium batteries
- 4) Full form of HVDC is \_\_\_\_\_.  
 a) High Voltage Direct Current  
 b) High Voltage Distribution Combination  
 c) High Value Direct Current  
 d) High Value Distribution Combination
- 5) Full form of EMU is \_\_\_\_\_.  
 a) Electronics Multiple Unit                  b) Electrical Multiple Unit  
 c) Electrical Multiple Usage                  d) Electrical Multiple User
- 6) The electric motor in a hybrid car can also act as: \_\_\_\_\_.  
 a) Cooling fan                                  b) Fuel pump  
 c) Generator                                      d) None of these
- 7) The value of area under acceleration-time graph is \_\_\_\_\_.  
 a) Velocity                                        b) Displacement  
 c) Force    d) Impulse
- 8) Full form of EV is \_\_\_\_\_.  
 a) Energy voltage                              b) Electric vehicles  
 c) Electric voltage                              d) Energy vehicles

- 9) Full form of ICV is \_\_\_\_\_.  
a) Internal combustion vehicles      b) Internet combustion vehicles  
c) Internally combined vehicles      d) Internet combined vehicles
- 10) What's the difference between a plug-in hybrid and a battery electric vehicle?  
a) There is no difference  
b) A plug-in hybrid only accepts AC power, while a battery electric vehicle accepts AC and DC power  
c) A plug-in hybrid can be powered by either the battery or the gasoline engine. A pure electric vehicle is powered only by the battery  
d) None of the above
- 11) The performance of a vehicle is usually described by \_\_\_\_\_.  
a) Its maximum cruising speed      b) Grade-ability  
c) Acceleration      d) All of the above
- 12) Which of the following is NOT the type of Hybrid Vehicle?  
a) Plug-in Hybrid      b) Parallel Hybrid  
c) Natural Gas for Vehicles      d) Series Hybrid
- 13) The transmission requirements of a vehicle depend on the characteristics of \_\_\_\_\_.  
a) The power plant  
b) The performance requirements of the vehicle  
c) The power plant and the performance requirements of the vehicle  
d) None of the above
- 14) Which type of motor is widely used for electric vehicle?  
a) Induction motor      b) DC shunt motor  
c) BLDC      d) Series motor



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Set Q
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Introduction to Electric and Hybrid Vehicles**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Attempt any two questions from each section.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Discuss the concept of Range Extender Battery.                      | <b>07</b> |
|            | <b>b)</b> Explain in short History of Electric Vehicles.                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Describe Electric Motor characteristics.                            | <b>07</b> |
|            | <b>b)</b> Discuss in detail strategy for battery cost reduction.              | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain with neat sketch Series and Parallel hybrid electric drive. | <b>07</b> |
|            | <b>b)</b> Write a note on concept of hybrid electric drive.                   | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Describe with neat sketch construction & working of AC Induction motor.         | <b>07</b> |
|            | <b>b)</b> What is SRM Motor? State advantages & disadvantages of SRM Motors.              | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is Chopper? Discuss with neat sketch its working advantages & limitations. | <b>07</b> |
|            | <b>b)</b> What is VFD? Discuss each section of VFD with neat sketch in detail.            | <b>07</b> |
| <b>Q.7</b> | <b>a) Define the following terms.</b>   | <b>08</b> |
|            | 1) Energy efficiency  |           |
|            | 2) Idling   |           |
|            | 3) Deceleration   |           |
|            | 4) Regeneration Efficiency  |           |
|            | <b>b)</b> What is Drive Cycle? Discuss any one case of drive cycle in detail.             | <b>06</b> |

Seat No.	
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Set R
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Introduction to Electric and Hybrid Vehicles**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Full form of HVDC is \_\_\_\_\_.  
 a) High Voltage Direct Current  
 b) High Voltage Distribution Combination  
 c) High Value Direct Current  
 d) High Value Distribution Combination
- 2) Full form of EMU is \_\_\_\_\_.  
 a) Electronics Multiple Unit  
 b) Electrical Multiple Unit  
 c) Electrical Multiple Usage  
 d) Electrical Multiple User
- 3) The electric motor in a hybrid car can also act as: \_\_\_\_\_.  
 a) Cooling fan  
 b) Fuel pump  
 c) Generator  
 d) None of these
- 4) The value of area under acceleration-time graph is \_\_\_\_\_.  
 a) Velocity  
 b) Displacement  
 c) Force  
 d) Impulse
- 5) Full form of EV is \_\_\_\_\_.  
 a) Energy voltage  
 b) Electric vehicles  
 c) Electric voltage  
 d) Energy vehicles
- 6) Full form of ICV is \_\_\_\_\_.  
 a) Internal combustion vehicles  
 b) Internet combustion vehicles  
 c) Internally combined vehicles  
 d) Internet combined vehicles
- 7) What's the difference between a plug-in hybrid and a battery electric vehicle?  
 a) There is no difference  
 b) A plug-in hybrid only accepts AC power, while a battery electric vehicle accepts AC and DC power  
 c) A plug-in hybrid can be powered by either the battery or the gasoline engine. A pure electric vehicle is powered only by the battery  
 d) None of the above

- 8) The performance of a vehicle is usually described by \_\_\_\_\_.  
a) Its maximum cruising speed      b) Grade-ability  
c) Acceleration      d) All of the above
- 9) Which of the following is NOT the type of Hybrid Vehicle?  
a) Plug-in Hybrid      b) Parallel Hybrid  
c) Natural Gas for Vehicles      d) Series Hybrid
- 10) The transmission requirements of a vehicle depend on the characteristics of \_\_\_\_\_.  
a) The power plant  
b) The performance requirements of the vehicle  
c) The power plant and the performance requirements of the vehicle  
d) None of the above
- 11) Which type of motor is widely used for electric vehicle?  
a) Induction motor      b) DC shunt motor  
c) BLDC      d) Series motor
- 12) Speed of D.C. shunt motors are controlled by \_\_\_\_\_.  
a) Flux control method      b) Rheostatic control method  
c) Voltage control method      d) All of these
- 13) In a series-switched hybrid \_\_\_\_\_.  
a) Is the weakest engine in series with the wheels  
b) The engines simultaneously drive the front and the rear axle  
c) Is the strongest engine in series with the wheels  
d) Goes the power through a succession of motors to the wheels
- 14) Electric Vehicles are generally powered by \_\_\_\_\_.  
a) Aluminum batteries      b) Lead-acid batteries  
c) Sodium batteries      d) Magnesium batteries

Seat No.	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Introduction to Electric and Hybrid Vehicles**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Attempt any two questions from each section.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Discuss the concept of Range Extender Battery.                      | <b>07</b> |
|            | <b>b)</b> Explain in short History of Electric Vehicles.                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Describe Electric Motor characteristics.                            | <b>07</b> |
|            | <b>b)</b> Discuss in detail strategy for battery cost reduction.              | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain with neat sketch Series and Parallel hybrid electric drive. | <b>07</b> |
|            | <b>b)</b> Write a note on concept of hybrid electric drive.                   | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Describe with neat sketch construction & working of AC Induction motor.         | <b>07</b> |
|            | <b>b)</b> What is SRM Motor? State advantages & disadvantages of SRM Motors.              | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is Chopper? Discuss with neat sketch its working advantages & limitations. | <b>07</b> |
|            | <b>b)</b> What is VFD? Discuss each section of VFD with neat sketch in detail.            | <b>07</b> |
| <b>Q.7</b> | <b>a) Define the following terms.</b>   | <b>08</b> |
|            | 1) Energy efficiency  |           |
|            | 2) Idling   |           |
|            | 3) Deceleration   |           |
|            | 4) Regeneration Efficiency  |           |
|            | <b>b)</b> What is Drive Cycle? Discuss any one case of drive cycle in detail.             | <b>06</b> |

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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Introduction to Electric and Hybrid Vehicles**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The transmission requirements of a vehicle depend on the characteristics of \_\_\_\_\_.  
 a) The power plant  
 b) The performance requirements of the vehicle  
 c) The power plant and the performance requirements of the vehicle  
 d) None of the above
- 2) Which type of motor is widely used for electric vehicle?  
 a) Induction motor  
 b) DC shunt motor  
 c) BLDC  
 d) Series motor
- 3) Speed of D.C. shunt motors are controlled by \_\_\_\_\_.  
 a) Flux control method  
 b) Rheostatic control method  
 c) Voltage control method  
 d) All of these
- 4) In a series-switched hybrid \_\_\_\_\_.  
 a) Is the weakest engine in series with the wheels  
 b) The engines simultaneously drive the front and the rear axle  
 c) Is the strongest engine in series with the wheels  
 d) Goes the power through a succession of motors to the wheels
- 5) Electric Vehicles are generally powered by \_\_\_\_\_.  
 a) Aluminum batteries  
 b) Lead-acid batteries  
 c) Sodium batteries  
 d) Magnesium batteries
- 6) Full form of HVDC is \_\_\_\_\_.  
 a) High Voltage Direct Current  
 b) High Voltage Distribution Combination  
 c) High Value Direct Current  
 d) High Value Distribution Combination
- 7) Full form of EMU is \_\_\_\_\_.  
 a) Electronics Multiple Unit  
 b) Electrical Multiple Unit  
 c) Electrical Multiple Usage  
 d) Electrical Multiple User



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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**

**Introduction to Electric and Hybrid Vehicles**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Attempt any two questions from each section.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Discuss the concept of Range Extender Battery.                      | <b>07</b> |
|            | <b>b)</b> Explain in short History of Electric Vehicles.                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Describe Electric Motor characteristics.                            | <b>07</b> |
|            | <b>b)</b> Discuss in detail strategy for battery cost reduction.              | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain with neat sketch Series and Parallel hybrid electric drive. | <b>07</b> |
|            | <b>b)</b> Write a note on concept of hybrid electric drive.                   | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Describe with neat sketch construction & working of AC Induction motor.         | <b>07</b> |
|            | <b>b)</b> What is SRM Motor? State advantages & disadvantages of SRM Motors.              | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is Chopper? Discuss with neat sketch its working advantages & limitations. | <b>07</b> |
|            | <b>b)</b> What is VFD? Discuss each section of VFD with neat sketch in detail.            | <b>07</b> |
| <b>Q.7</b> | <b>a) Define the following terms.</b>   | <b>08</b> |
|            | 1) Energy efficiency  |           |
|            | 2) Idling   |           |
|            | 3) Deceleration   |           |
|            | 4) Regeneration Efficiency  |           |
|            | <b>b)</b> What is Drive Cycle? Discuss any one case of drive cycle in detail.             | <b>06</b> |

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above



- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.  
a) which can be only changed in the long run  
b) which can be changed in the short run  
c) which can be never be changed  
d) All of the above
- 10) Which one of the following is not the function of money?  
a) Medium of exchange  
b) Measure of Happiness  
c) Standard of deferred payment  
d) Store of value

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-100**

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850

- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks:10

10

- Page 7 of 12

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**MECHANICAL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set 

R
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022****MECHANICAL ENGINEERING****Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 2) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 3) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 4) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 5) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 6) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 7) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**MECHANICAL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 2) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 3) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
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- 4) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
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- 6) Which is distinctive nature of family?
 

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- 8) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
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- 9) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 10) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Four)**

**16**

- a) Explain nature and types of status.
- b) What demographic changes are observed in Indian population?
- c) Explain the meaning and features of socialization.
- d) Write on meaning and nature of Modernization.
- e) What is the radical movement?
- f) What are bases of a community?

**Q.3 a) Explain the meaning and characteristics of human society.**

**12**

**OR**

- b) What are the major trends in urbanization in developing countries?**

**Q.4 Explain the causes and consequences of environmental degradation.**

**12**

<b>Seat No.</b>	
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- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

**Seat  
No.**

Set	Q
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks.

Marks: 10

10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
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| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later      b) Drink alcohol to relax  
c) Break it down into smaller task      d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
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| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |



Seat No.	
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Set	S
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks

Marks:10

10

- Page 1 of 12

- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

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<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 2) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
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  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 5) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above
- 6) The objectives of professional ethics in engineering are
  - a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

- a) Culture
- c) Society

- b) Value
- d) Moral

- a) Moral  
c) Values

- b) Ethics
- d) Positive and preferred values

<b>Seat No.</b>	
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**Set**

<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022****MECHANICAL ENGINEERING****Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

Seat No.	
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Set

P

**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Design – I**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries on mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data if necessary and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Hooke's law holds good up to
  - a) breaking point
  - b) yield point
  - c) elastic limit
  - d) plastic limit
- 2) When a circular shaft is subjected to torque, the torsional shear stress is
  - a) directly proportional to the distance from the axis
  - b) inversely proportional to the distance from the axis
  - c) proportional to the square of the distance from the axis
  - d) constant throughout the cross-section
- 3) The neutral axis of a beam is
  - a) layer subjected to tensile stress
  - b) layer subjected to compressive stress
  - c) layer subjected to zero stress
  - d) none of the above
- 4) Stress concentration occurs due to
  - a) abrupt change in cross-section
  - b) discontinuities in components
  - c) internal cracks and flaws
  - d) any one of the above
- 5) Cold working
  - a) increases fatigue strength
  - b) decreases fatigue strength
  - c) has no influence on fatigue strength
  - d) none of the above
- 6) The designation M 36 x 2 means
  - a) metric fine threads of 36 mm outside diameter and 2 mm pitch
  - b) metric coarse threads of 36 mm outside diameter and 2 mm pitch
  - c) metric threads of 36 mm pitch diameter and 2 mm pitch
  - d) metric threads of 36 mm core diameter and 2 mm pitch



- 7) The weakest plane in a fillet weld is  
 a) the throat  
 b) side parallel to the force  
 c) smaller of two sides  
 d) side normal to the force
- 8) A rivet is specified by  
 a) shank diameter  
 b) length of rivet  
 c) type of head  
 d) material of rivet
- 9) A transmission shaft subjected to bending and torsional moments should be designed on the basis of  
 a) Rankine theory  
 b) Coulomb, Tresca and Guest theory  
 c) Huber von Mises theory  
 d) Goodman or Soderberg diagrams
- 10) In case of sunk key,  
 a) the keyway is cut in the shaft only  
 b) the keyway is cut in the hub only  
 c) the keyway is cut in both the shaft and the hub  
 d) none of the above
- 11) When the helical extension spring is subjected to axial tensile force, the type of stress induced in the spring wire is,  
 a) tensile stress  
 b) compressive stress  
 c) bending stress  
 d) torsional shear stress
- 12) Two springs of stiffness  $k_1$  and  $k_2$  are connected in series, the combined stiffness of the connection is given by  
 a)  $\frac{k_1 k_2}{k_1 + k_2}$   
 b)  $\frac{k_1 k_2}{k_1 - k_2}$   
 c)  $k_1 + K_2$   
 d)  $\frac{k_1 + k_2}{k_1 k_2}$
- 13) The stress is induced in the belt is,  
 a) tensile stress  
 b) compressive stress  
 c) direct shear stress  
 d) torsional shear stress
- 14) A V belt designated as B 4430 Lp has  
 a) 4430 mm as diameter of small pulley  
 b) 4430 mm as nominal pitch length  
 c) 4430 mm as diameter of large pulley  
 d) 4430 mm as center distance between pulleys

Seat No.	
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Set	P
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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Design – I**

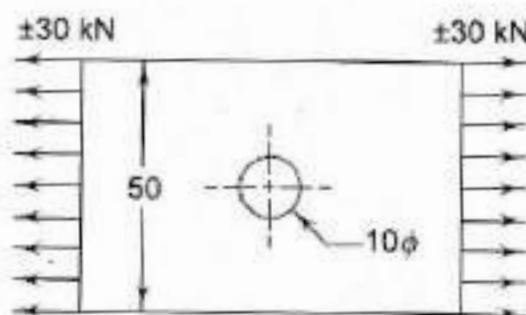
Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.

**Section – I**

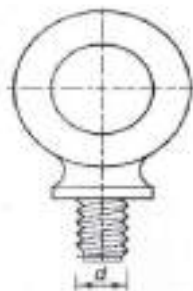
- Q.2** a) Explain Design Procedure for Cotter joint. **07**  
 b) Define Factor of safety. Explain factor affecting on selection of Factor of safety and its physical significance. **04**  
 c) Explain design procedure for machine element. **03**
- Q.3** a) A plate made of steel 20C8 ( $S_{ut} = 440 \text{ N/mm}^2$ ) in hot rolled and normalized condition is shown in Fig. It is subjected to a completely reversed axial load of 30 kN. The notch sensitivity factor  $q$  can be taken as 0.8 and the expected reliability is 90%. The size factor is 0.85. The factor of safety is 2. Determine the plate thickness for infinite life. Take  $K_a = 0.67$ ,  $K_b = 0.85$ , For 90% reliability,  $K_c = 0.897$ ,  $K_t = 2.51$  **08**



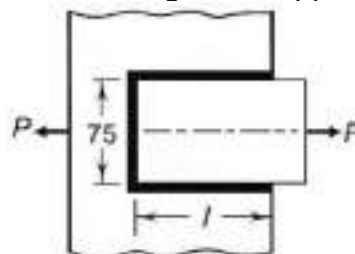
- c) Explain the Goodman and Soderberg diagram. **06**
- Q.4** a) A V-belt drive is required for a 15-k W, 1440 rpm electric motor, which drives a centrifugal pump running at 360 rpm for a service of 24 hours per day. From space considerations, the center distance should be approximately 1m. Take  $d=200\text{mm}$ ,  $F_a=1.2$ ,  $P_r=6.36$ . Determine  
 (i) belt specifications  
 (ii) number of belts  
 (iii) correct center distance  
 (iv) pulley diameters  
 (Refer the standard table given at the end of question paper) **08**
- b) Differentiate between Flat Belt Drive and V-Belt Drive. **06**

## Section – II

- Q.5** a) The standard cross-section for a flat key, which is fitted on a 50 mm diameter shaft, is 16 x 10 mm. The key is transmitting 475 N-m torque from the shaft to the hub. The key is made of commercial steel ( $S_{yt} = S_{yc} = 230$  N/mm<sup>2</sup>). Determine the length of the key, if the factor of safety is 3. **07**
- b) Differentiate between Rigid Coupling and Flexible Coupling. **04**
- c) Explain ASME code used for shaft design. **03**
- Q.6** a) Explain series and parallel springs for finding the Stiffness of Spring. **06**
- b) It is required to design a helical compression spring subjected to a maximum force of 1250 N. the deflection of the spring corresponding to the maximum force should be approximately 30 mm. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire. The ultimate tensile strength and modulus of rigidity of the spring material are 1090 and 81370 N/mm<sup>2</sup> respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Consider the spring has square and ground end. Design the spring and calculate:
- Wire diameter
  - Mean coil diameter
  - Number of active coils
  - Total number of coils
  - Free length of the spring
  - Pitch of the coil
- 08**
- Q.7** a) Derive the equation for Strength of butt welds. **04**
- b) An electric motor weighing 10 kN is lifted by means of an eye bolt as shown in Fig. The eye bolt is screwed into the frame of the motor. The eye bolt has coarse threads. It is made of plain carbon steel 30C8 ( $S_{yt} = 400$  N/mm<sup>2</sup>) and the factor of safety is 6. Determine the size of the bolt. **04**



- c) A plate, 75mm wide and 10mm thick, is joined with another steel plate by mean of single transverse and double parallel fillet welds, as shown in Fig. the joint is subjected to a maximum tensile force of 55 kN. The permissible tensile and shear stresses in the weld material are 70 and 50 N/mm<sup>2</sup> respectively. Determine the required length of each parallel fillet weld. Consider 15 mm of length for starting and stopping of the weld run. **06**



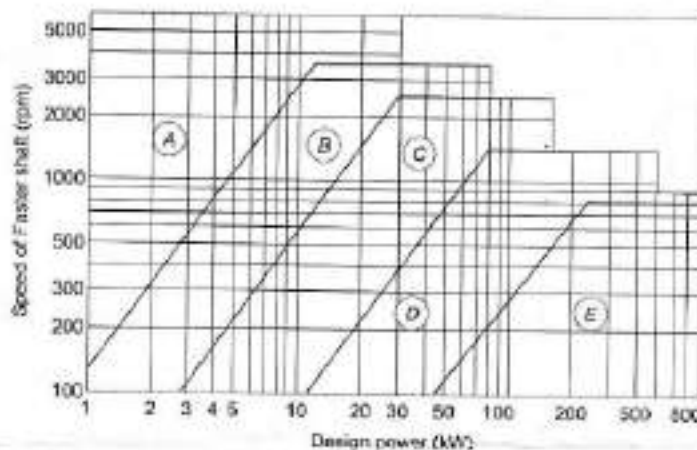


Table 20mm belt length for standard sizes of V-belts

Z	Pitch length of belt $L_p$ (mm)				
	A	B	C	D	E
405	430	930	1560	2790	4660
475	500	1000	1700	3130	5040
530	560	1100	1950	3390	5420
625	660	1210	2190	3730	6100
700	760	1370	2420	4080	6850
780	860	1540	2720	4520	7650
920	1000	1760	3080	5000	8550
1080	1160	2000	3500	5600	9550
1220	1330	2260	3980	6200	10700
1420	1540	2560	4520	7000	12000
1540	1700	2800	5000	7800	13400
1640	1860	3060	5500	8600	14800
2030	2300	3760	6800	10700	18200
2200	2500	4060	7400	11700	19800
2300	2600	4260	7800	12300	20800
2400	2700	4460	8200	12900	21800
2570	2870	4660	8600	13500	22800
2700	3000	4860	9000	14100	23800
2910	3200	5160	9600	15100	25400
3080	3370	5360	10000	15700	26400
3290	3570	5660	10600	16700	28000
3540	3820	6060	11300	17700	29600

Table 13.22 Correction factor for arc of contact ( $F_d$ )

$\frac{D-d}{C}$	Arc of contact on smaller pulley (in degrees)	Correction Factor $F_d$
0.00	180	1.00
0.05	177	0.99
0.10	174	0.99
0.15	171	0.98
0.20	169	0.97
0.25	166	0.97
0.30	163	0.96
0.35	160	0.95
0.40	157	0.94
0.45	154	0.93
0.50	151	0.93
0.55	148	0.92
0.60	145	0.91
0.65	142	0.90
0.70	139	0.89
0.75	136	0.88
0.80	133	0.87
0.85	130	0.86
0.90	127	0.85
0.95	123	0.83
1.00	120	0.82

Table 13.24 Correction factors for belt pitch length ( $F_L$ )

Correction Factor	Belt pitch length (mm)					
	A	B	C	D	E	
0.80	630					
0.81		650				
0.82	700		1500	2780		
0.83		1000				
0.84	750		1700			
0.85		1100				
0.86	800			4100		
0.87		1210	1900	3300		
0.88	850					
0.89		1300				
0.90	900					
0.91		1400	2100	3700	4000	
0.92	950		2300	4000	5000	
0.93		1500				
0.94	1000		2500	4400	5400	
0.95		1600	2600	4800	6100	
0.96	1050		2800	5100	6400	
0.97		1700				
0.98	1100		3000	5500	6800	
0.99		1800	3100	5900	7200	8100
1.00	1150		3300	6300	7600	9100
1.01		1900				
1.02	1200		3500	6700	8000	
1.03		2000	3600	7100	8400	9900
1.04	1250		3800	7500	8800	
1.05		2100				
1.06	1300		4000	7900	9200	
1.07		2200				
1.08	1350		4200	8300	9600	
1.09		2300	4300	8700	10000	11700
1.10	1400		4400	9100	10400	
1.11		2400				
1.12	1450		4600	9500	10800	
1.13		2500				
1.14	1500		4800	9900	11200	
1.15		2600	4900	10300	11600	13200
1.16	1550		5000	10700	12000	
1.17		2700				
1.18	1600		5200	11100	12400	15200

Seat No.	
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Set Q
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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Design – I**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries on mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A rivet is specified by
 

a) shank diameter	b) length of rivet
c) type of head	d) material of rivet
- 2) A transmission shaft subjected to bending and torsional moments should be designed on the basis of
  - a) Rankine theory
  - b) Coulomb, Tresca and Guest theory
  - c) Huber von Mises theory
  - d) Goodman or Soderberg diagrams
- 3) In case of sunk key,
  - a) the keyway is cut in the shaft only
  - b) the keyway is cut in the hub only
  - c) the keyway is cut in both the shaft and the hub
  - d) none of the above
- 4) When the helical extension spring is subjected to axial tensile force, the type of stress induced in the spring wire is,
  - a) tensile stress
  - b) compressive stress
  - c) bending stress
  - d) torsional shear stress
- 5) Two springs of stiffness  $k_1$  and  $k_2$  are connected in series, the combined stiffness of the connection is given by
 

a) $\frac{k_1 k_2}{k_1 + k_2}$	b) $\frac{k_1 k_2}{k_1 - k_2}$
c) $k_1 + k_2$	d) $\frac{k_1 + k_2}{k_1 k_2}$
- 6) The stress is induced in the belt is,
 

a) tensile stress	b) compressive stress
c) direct shear stress	d) torsional shear stress

- 7) A V belt designated as B 4430 Lp has  
a) 4430 mm as diameter of small pulley  
b) 4430 mm as nominal pitch length  
c) 4430 mm as diameter of large pulley  
d) 4430 mm as center distance between pulleys
- 8) Hooke's law holds good up to  
a) breaking point                      b) yield point  
c) elastic limit                      d) plastic limit
- 9) When a circular shaft is subjected to torque, the torsional shear stress is  
a) directly proportional to the distance from the axis  
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d) constant throughout the cross-section
- 10) The neutral axis of a beam is  
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- 11) Stress concentration occurs due to  
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c) internal cracks and flaws  
d) any one of the above
- 12) Cold working  
a) increases fatigue strength  
b) decreases fatigue strength  
c) has no influence on fatigue strength  
d) none of the above
- 13) The designation M 36 x 2 means  
a) metric fine threads of 36 mm outside diameter and 2 mm pitch  
b) metric coarse threads of 36 mm outside diameter and 2 mm pitch  
c) metric threads of 36 mm pitch diameter and 2 mm pitch  
d) metric threads of 36 mm core diameter and 2 mm pitch
- 14) The weakest plane in a fillet weld is  
a) the throat                      b) side parallel to the force  
c) smaller of two sides                      d) side normal to the force

Seat No.	
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Set	Q
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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Design – I**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

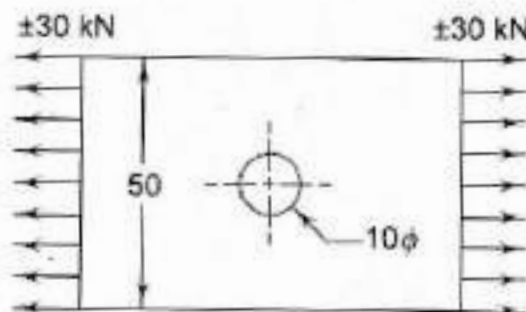
Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
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 3) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.2** a) Explain Design Procedure for Cotter joint. **07**  
 b) Define Factor of safety. Explain factor affecting on selection of Factor of safety and its physical significance. **04**  
 c) Explain design procedure for machine element. **03**

- Q.3** a) A plate made of steel 20C8 ( $S_{ut} = 440 \text{ N/mm}^2$ ) in hot rolled and normalized condition is shown in Fig. It is subjected to a completely reversed axial load of 30 kN. The notch sensitivity factor  $q$  can be taken as 0.8 and the expected reliability is 90%. The size factor is 0.85. The factor of safety is 2. Determine the plate thickness for infinite life. Take  $K_a = 0.67$ ,  $K_b = 0.85$ , For 90% reliability,  $K_c = 0.897$ ,  $K_t = 2.51$  **08**

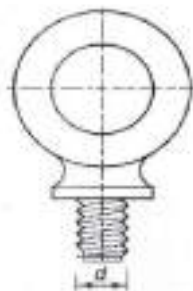


- c) Explain the Goodman and Soderberg diagram. **06**
- Q.4** a) A V-belt drive is required for a 15-k W, 1440 rpm electric motor, which drives acentrifugal pump running at 360 rpm for a service of 24 hours per day. From space considerations, the center distance should be approximately 1m. Take  $d=200\text{mm}$ ,  $F_a=1.2$ ,  $P_r=6.36$ . Determine  
 (i) belt specifications  
 (ii) number of belts  
 (iii) correct center distance  
 (iv) pulley diameters  
 (Refer the standard table given at the end of question paper) **08**
- b) Differentiate between Flat Belt Drive and V-Belt Drive. **06**

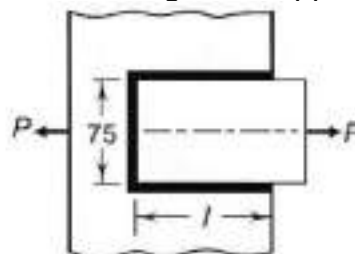


**Section – II**

- Q.5** a) The standard cross-section for a flat key, which is fitted on a 50 mm diameter shaft, is 16 x 10 mm. The key is transmitting 475 N-m torque from the shaft to the hub. The key is made of commercial steel ( $S_{yt} = S_{yc} = 230$  N/mm<sup>2</sup>). Determine the length of the key, if the factor of safety is 3. **07**
- b) Differentiate between Rigid Coupling and Flexible Coupling. **04**
- c) Explain ASME code used for shaft design. **03**
- Q.6** a) Explain series and parallel springs for finding the Stiffness of Spring. **06**
- b) It is required to design a helical compression spring subjected to a maximum force of 1250 N. the deflection of the spring corresponding to the maximum force should be approximately 30 mm. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire. The ultimate tensile strength and modulus of rigidity of the spring material are 1090 and 81370 N/mm<sup>2</sup> respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Consider the spring has square and ground end. Design the spring and calculate:
- Wire diameter
  - Mean coil diameter
  - Number of active coils
  - Total number of coils
  - Free length of the spring
  - Pitch of the coil
- 08**
- Q.7** a) Derive the equation for Strength of butt welds. **04**
- b) An electric motor weighing 10 kN is lifted by means of an eye bolt as shown in Fig. The eye bolt is screwed into the frame of the motor. The eye bolt has coarse threads. It is made of plain carbon steel 30C8 ( $S_{yt} = 400$  N/mm<sup>2</sup>) and the factor of safety is 6. Determine the size of the bolt. **04**



- c) A plate, 75mm wide and 10mm thick, is joined with another steel plate by mean of single transverse and double parallel fillet welds, as shown in Fig. the joint is subjected to a maximum tensile force of 55 kN. The permissible tensile and shear stresses in the weld material are 70 and 50 N/mm<sup>2</sup> respectively. Determine the required length of each parallel fillet weld. Consider 15 mm of length for starting and stopping of the weld run. **06**





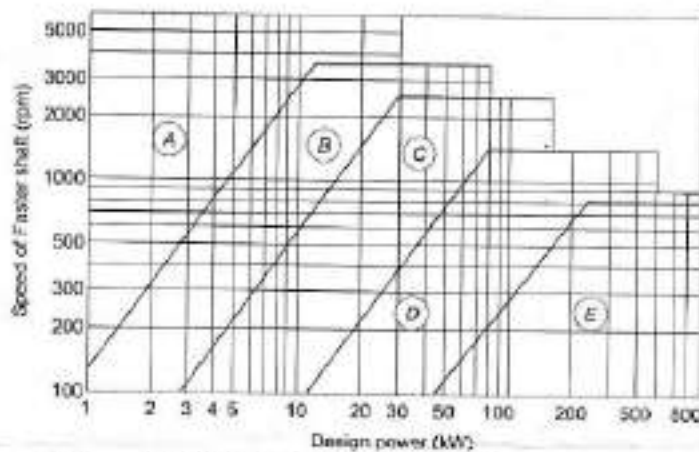


Table 20mm belt length for standard sizes of V-belts

Pitch length of belt $L_p$ (mm)					
Z	A	B	C	D	E
405	430	930	1560	2790	4660
475	500	1000	1700	3130	5040
530	560	1100	1950	3390	5420
625	660	1210	2190	3730	6100
700	760	1370	2420	4080	6850
780	860	1500	2720	4520	7650
920	1000	1690	2980	5000	8550
1080	1160	1890	3280	5500	9550
1220	1330	1950	3510	6000	10750
1420	1540	2180	3820	6600	12200
1540	1700	2360	4060	7100	13800
1640	1840	2500	4300	7600	15400
2030	2300	3160	5360	9300	19700
2200	2530	3390	5710	10000	21600
2300	2700	3520	5920	10700	23700
2400	2800	3600	6080	11200	25200
2570	3000	3900	6500	12000	27700
2700	3200	4100	6800	12700	29800
2910	3420	4420	7300	13700	32800
3080	3670	4670	7600	14500	35200
3290	3900	4900	8000	15400	38200
3540	4160	5160	8400	16400	41200

Table 13.22 Correction factor for arc of contact ( $F_d$ )

$\frac{D-d}{C}$	Arc of contact on smaller pulley (in degrees)	Correction Factor $F_d$
0.00	180	1.00
0.05	177	0.99
0.10	174	0.99
0.15	171	0.98
0.20	169	0.97
0.25	166	0.97
0.30	163	0.96
0.35	160	0.95
0.40	157	0.94
0.45	154	0.93
0.50	151	0.93
0.55	148	0.92
0.60	145	0.91
0.65	142	0.90
0.70	139	0.89
0.75	136	0.88
0.80	133	0.87
0.85	130	0.86
0.90	127	0.85
0.95	123	0.83
1.00	120	0.82

Table 13.24 Correction factors for belt pitch length ( $F_L$ )

Correction Factor	Belt pitch length (mm)					
	A	B	C	D	E	
0.80	630					
0.81		650				
0.82	700		1500	2780		
0.83		1000				
0.84	750		1700			
0.85		1100				
0.86	800			4100		
0.87		1210	1900	3300		
0.88	850					
0.89		1300				
0.90	900		1970	2100	3700	4600
0.91		1400		2340		
0.92	950		1500	2400	4000	5000
0.93		1500				
0.94	1000			2730	4600	5800
0.95		1600		2800		
0.96	1050		1430	3000	5100	6100
0.97		1700				
0.98	1100			3300		
0.99		1800		3500		
1.00	1150		1750	3600	5500	6800
1.01		1900				
1.02	1200			3700	5900	7300
1.03		2000				
1.04	1250		2000	3800	6300	7800
1.05		2100				
1.06	1300		2100	3900	6700	8300
1.07		2200				
1.08	1350		2200	4000	7100	8800
1.09		2300				
1.10	1400		2300	4100	7500	9300
1.11		2400				
1.12	1450			4200	7900	9800
1.13		2500				
1.14	1500		2500	4300	8300	10300
1.15		2600				
1.16	1550			4400	8700	10800
1.17		2700				
1.18	1600		2700	4500	9100	11300

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Set R
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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Design – I**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries on mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data if necessary and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) When the helical extension spring is subjected to axial tensile force, the type of stress induced in the spring wire is,
  - a) tensile stress
  - b) compressive stress
  - c) bending stress
  - d) torsional shear stress
- 2) Two springs of stiffness  $k_1$  and  $k_2$  are connected in series, the combined stiffness of the connection is given by
 

a) $\frac{k_1 k_2}{k_1 + k_2}$	b) $\frac{k_1 k_2}{k_1 - k_2}$
c) $k_1 + k_2$	d) $\frac{k_1 + k_2}{k_1 k_2}$
- 3) The stress is induced in the belt is,
 

a) tensile stress	b) compressive stress
c) direct shear stress	d) torsional shear stress
- 4) A V belt designated as B 4430 Lp has
  - a) 4430 mm as diameter of small pulley
  - b) 4430 mm as nominal pitch length
  - c) 4430 mm as diameter of large pulley
  - d) 4430 mm as center distance between pulleys
- 5) Hooke's law holds good up to
 

a) breaking point	b) yield point
c) elastic limit	d) plastic limit
- 6) When a circular shaft is subjected to torque, the torsional shear stress is
  - a) directly proportional to the distance from the axis
  - b) inversely proportional to the distance from the axis
  - c) proportional to the square of the distance from the axis
  - d) constant throughout the cross-section

- 7) The neutral axis of a beam is  
a) layer subjected to tensile stress  
b) layer subjected to compressive stress  
c) layer subjected to zero stress  
d) none of the above
- 8) Stress concentration occurs due to  
a) abrupt change in cross-section  
b) discontinuities in components  
c) internal cracks and flaws  
d) any one of the above
- 9) Cold working  
a) increases fatigue strength  
b) decreases fatigue strength  
c) has no influence on fatigue strength  
d) none of the above
- 10) The designation M 36 x 2 means  
a) metric fine threads of 36 mm outside diameter and 2 mm pitch  
b) metric coarse threads of 36 mm outside diameter and 2 mm pitch  
c) metric threads of 36 mm pitch diameter and 2 mm pitch  
d) metric threads of 36 mm core diameter and 2 mm pitch
- 11) The weakest plane in a fillet weld is  
a) the throat  
b) side parallel to the force  
c) smaller of two sides  
d) side normal to the force
- 12) A rivet is specified by  
a) shank diameter  
b) length of rivet  
c) type of head  
d) material of rivet
- 13) A transmission shaft subjected to bending and torsional moments should be designed on the basis of  
a) Rankine theory  
b) Coulomb, Tresca and Guest theory  
c) Huber von Mises theory  
d) Goodman or Soderberg diagrams
- 14) In case of sunk key,  
a) the keyway is cut in the shaft only  
b) the keyway is cut in the hub only  
c) the keyway is cut in both the shaft and the hub  
d) none of the above

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Design – I**

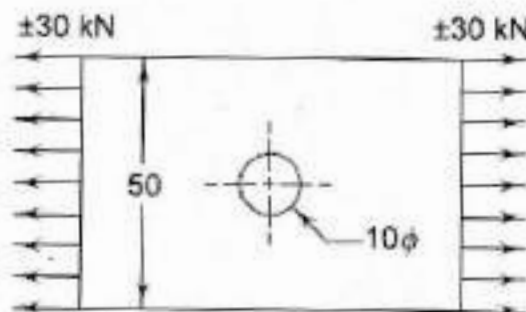
Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.

**Section – I**

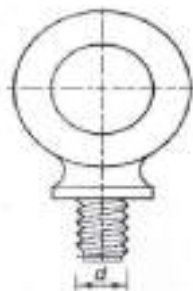
- Q.2** a) Explain Design Procedure for Cotter joint. **07**  
 b) Define Factor of safety. Explain factor affecting on selection of Factor of safety and its physical significance. **04**  
 c) Explain design procedure for machine element. **03**
- Q.3** a) A plate made of steel 20C8 ( $S_{ut} = 440 \text{ N/mm}^2$ ) in hot rolled and normalized condition is shown in Fig. It is subjected to a completely reversed axial load of 30 kN. The notch sensitivity factor  $q$  can be taken as 0.8 and the expected reliability is 90%. The size factor is 0.85. The factor of safety is 2. Determine the plate thickness for infinite life. Take  $K_a = 0.67$ ,  $K_b = 0.85$ , For 90% reliability,  $K_c = 0.897$ ,  $K_t = 2.51$  **08**



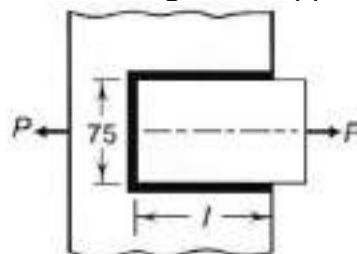
- c) Explain the Goodman and Soderberg diagram. **06**
- Q.4** a) A V-belt drive is required for a 15-k W, 1440 rpm electric motor, which drives a centrifugal pump running at 360 rpm for a service of 24 hours per day. From space considerations, the center distance should be approximately 1m. Take  $d=200\text{mm}$ ,  $F_a=1.2$ ,  $P_r=6.36$ . Determine  
 (i) belt specifications  
 (ii) number of belts  
 (iii) correct center distance  
 (iv) pulley diameters  
 (Refer the standard table given at the end of question paper) **08**
- b) Differentiate between Flat Belt Drive and V-Belt Drive. **06**

## Section – II

- Q.5** a) The standard cross-section for a flat key, which is fitted on a 50 mm diameter shaft, is 16 x 10 mm. The key is transmitting 475 N-m torque from the shaft to the hub. The key is made of commercial steel ( $S_{yt} = S_{yc} = 230$  N/mm<sup>2</sup>). Determine the length of the key, if the factor of safety is 3. **07**
- b) Differentiate between Rigid Coupling and Flexible Coupling. **04**
- c) Explain ASME code used for shaft design. **03**
- Q.6** a) Explain series and parallel springs for finding the Stiffness of Spring. **06**
- b) It is required to design a helical compression spring subjected to a maximum force of 1250 N. the deflection of the spring corresponding to the maximum force should be approximately 30 mm. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire. The ultimate tensile strength and modulus of rigidity of the spring material are 1090 and 81370 N/mm<sup>2</sup> respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Consider the spring has square and ground end. Design the spring and calculate:
- Wire diameter
  - Mean coil diameter
  - Number of active coils
  - Total number of coils
  - Free length of the spring
  - Pitch of the coil
- 08**
- Q.7** a) Derive the equation for Strength of butt welds. **04**
- b) An electric motor weighing 10 kN is lifted by means of an eye bolt as shown in Fig. The eye bolt is screwed into the frame of the motor. The eye bolt has coarse threads. It is made of plain carbon steel 30C8 ( $S_{yt} = 400$  N/mm<sup>2</sup>) and the factor of safety is 6. Determine the size of the bolt. **04**



- c) A plate, 75mm wide and 10mm thick, is joined with another steel plate by mean of single transverse and double parallel fillet welds, as shown in Fig. the joint is subjected to a maximum tensile force of 55 kN. The permissible tensile and shear stresses in the weld material are 70 and 50 N/mm<sup>2</sup> respectively. Determine the required length of each parallel fillet weld. Consider 15 mm of length for starting and stopping of the weld run. **06**



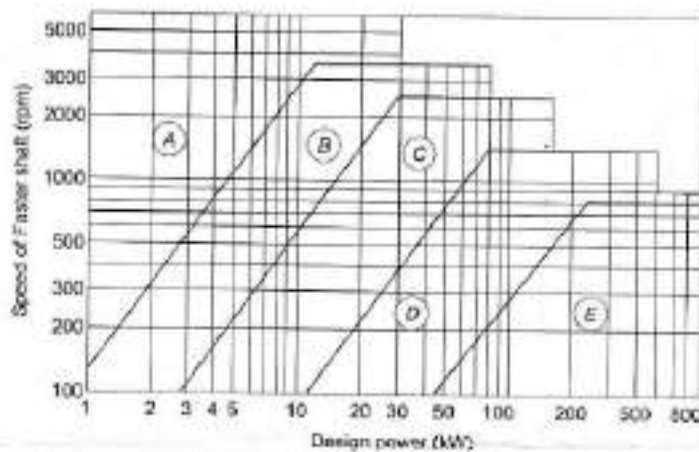


Table 20mm belt length for standard sizes of V-belts

Pitch length of belt $L_p$ (mm)					
Z	A	B	C	D	E
405	430	930	1560	2790	4660
475	500	1000	1700	3130	5040
530	560	1100	1950	3570	5420
625	660	1210	2190	3730	6100
700	960	1370	2420	4080	6850
780	1300	1560	2720	4620	7650
920	1750	1890	3550	5400	9150
1080	2430	2160	4080	6100	12220
1220	2530	2950	5310	6600	13750
1420	3640	3180	6520	7620	15280
1540	3790	3260	6660	8810	16800
1940	4260	3600	8140		
2030	3760	5340	10700		
2200	4230	6310	12200		
2300	3300	6820	13700		
2400	3900	7600	15200		
2570	4000	9100			
2700	4400	10700			
2910	4820				
3080	5370				
3290	6070				
3540					

Table 13.22 Correction factor for arc of contact ( $F_d$ )

$\frac{D-d}{C}$	Arc of contact on smaller pulley (in degrees)	Correction Factor $F_d$
0.00	180	1.00
0.05	177	0.99
0.10	174	0.99
0.15	171	0.98
0.20	169	0.97
0.25	166	0.97
0.30	163	0.96
0.35	160	0.95
0.40	157	0.94
0.45	154	0.93
0.50	151	0.93
0.55	148	0.92
0.60	145	0.91
0.65	142	0.90
0.70	139	0.89
0.75	136	0.88
0.80	133	0.87
0.85	130	0.86
0.90	127	0.85
0.95	123	0.83
1.00	120	0.82

Table 13.24 Correction factors for belt pitch length ( $F_L$ )

Correction Factor	Belt pitch length (mm)					
	A	B	C	D	E	
0.80	630					
0.81		670				
0.82	700		1560	2790		
0.83		1000				
0.84	790		1700			
0.85		1100				
0.86	860	800		4130		
0.87		1210	1950	3570		
0.88	990					
0.89						
0.90	1100	1970	2190	3730	4660	
0.91			2340			
0.92	1300	1560	2490	4080	5040	
0.93		1210				
0.94			2730	4620	5420	
0.95	1430	1760	2600			
0.96		1430	3080		6100	
0.97			1970			
0.98	1640	1940		3510		
0.99		1640	2190	3520		6850
1.00	1750	2300			6100	
1.01	1940	2500	4080			7650
1.02				4620		
1.03	2080	2700				
1.04		2200	2850	4600	7620	9150
1.05	2300					
1.06		2800				
1.07	2500				8410	9950
1.08		2480	3500	5380		
1.09	2570				9140	10710
1.10	2700	3600				
1.11			6100			
1.12	2910			10700	12280	
1.13		4060				
1.14	3290		8860			13750
1.15		4430				
1.16	3540		7600	12280		
1.17		5000		13750	15280	
1.18		5550				



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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Design – I**

Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries on mark.  
2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
3) Figures to the right indicate full marks.  
4) Assume suitable data if necessary and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The designation M 36 x 2 means
  - a) metric fine threads of 36 mm outside diameter and 2 mm pitch
  - b) metric coarse threads of 36 mm outside diameter and 2 mm pitch
  - c) metric threads of 36 mm pitch diameter and 2 mm pitch
  - d) metric threads of 36 mm core diameter and 2 mm pitch
- 2) The weakest plane in a fillet weld is
  - a) the throat
  - b) side parallel to the force
  - c) smaller of two sides
  - d) side normal to the force
- 3) A rivet is specified by
  - a) shank diameter
  - b) length of rivet
  - c) type of head
  - d) material of rivet
- 4) A transmission shaft subjected to bending and torsional moments should be designed on the basis of
  - a) Rankine theory
  - b) Coulomb, Tresca and Guest theory
  - c) Huber von Mises theory
  - d) Goodman or Soderberg diagrams
- 5) In case of sunk key,
  - a) the keyway is cut in the shaft only
  - b) the keyway is cut in the hub only
  - c) the keyway is cut in both the shaft and the hub
  - d) none of the above
- 6) When the helical extension spring is subjected to axial tensile force, the type of stress induced in the spring wire is,
  - a) tensile stress
  - b) compressive stress
  - c) bending stress
  - d) torsional shear stress

- 7) Two springs of stiffness  $k_1$  and  $k_2$  are connected in series, the combined stiffness of the connection is given by
- a)  $\frac{k_1 k_2}{k_1 + k_2}$                       b)  $\frac{k_1 k_2}{k_1 - k_2}$   
c)  $k_1 + k_2$                       d)  $\frac{k_1 + k_2}{k_1 k_2}$
- 8) The stress is induced in the belt is,
- a) tensile stress                      b) compressive stress  
c) direct shear stress              d) torsional shear stress
- 9) A V belt designated as B 4430 Lp has
- a) 4430 mm as diameter of small pulley  
b) 4430 mm as nominal pitch length  
c) 4430 mm as diameter of large pulley  
d) 4430 mm as center distance between pulleys
- 10) Hooke's law holds good up to
- a) breaking point                      b) yield point  
c) elastic limit                      d) plastic limit
- 11) When a circular shaft is subjected to torque, the torsional shear stress is
- a) directly proportional to the distance from the axis  
b) inversely proportional to the distance from the axis  
c) proportional to the square of the distance from the axis  
d) constant throughout the cross-section
- 12) The neutral axis of a beam is
- a) layer subjected to tensile stress  
b) layer subjected to compressive stress  
c) layer subjected to zero stress  
d) none of the above
- 13) Stress concentration occurs due to
- a) abrupt change in cross-section  
b) discontinuities in components  
c) internal cracks and flaws  
d) any one of the above
- 14) Cold working
- a) increases fatigue strength  
b) decreases fatigue strength  
c) has no influence on fatigue strength  
d) none of the above



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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Design – I**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

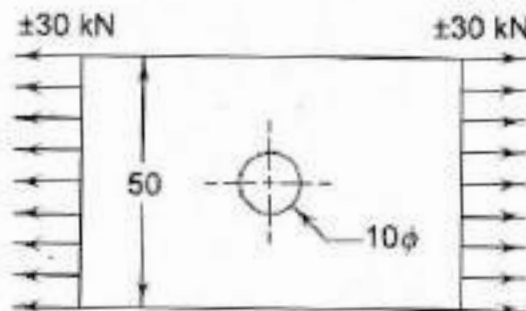
Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.2** a) Explain Design Procedure for Cotter joint. **07**  
 b) Define Factor of safety. Explain factor affecting on selection of Factor of safety and its physical significance. **04**  
 c) Explain design procedure for machine element. **03**

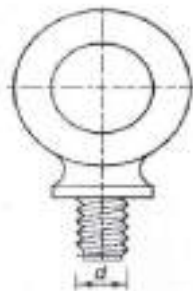
- Q.3** a) A plate made of steel 20C8 ( $S_{ut} = 440 \text{ N/mm}^2$ ) in hot rolled and normalized condition is shown in Fig. It is subjected to a completely reversed axial load of 30 kN. The notch sensitivity factor  $q$  can be taken as 0.8 and the expected reliability is 90%. The size factor is 0.85. The factor of safety is 2. Determine the plate thickness for infinite life. Take  $K_a = 0.67$ ,  $K_b = 0.85$ , For 90% reliability,  $K_c = 0.897$ ,  $K_t = 2.51$  **08**



- c) Explain the Goodman and Soderberg diagram. **06**
- Q.4** a) A V-belt drive is required for a 15-k W, 1440 rpm electric motor, which drives acentrifugal pump running at 360 rpm for a service of 24 hours per day. From space considerations, the center distance should be approximately 1m. Take  $d=200\text{mm}$ ,  $F_a=1.2$ ,  $P_r=6.36$ . Determine  
 (i) belt specifications  
 (ii) number of belts  
 (iii) correct center distance  
 (iv) pulley diameters  
 (Refer the standard table given at the end of question paper) **08**
- b) Differentiate between Flat Belt Drive and V-Belt Drive. **06**

**Section – II**

- Q.5** a) The standard cross-section for a flat key, which is fitted on a 50 mm diameter shaft, is 16 x 10 mm. The key is transmitting 475 N-m torque from the shaft to the hub. The key is made of commercial steel ( $S_{yt} = S_{yc} = 230 \text{ N/mm}^2$ ). Determine the length of the key, if the factor of safety is 3. **07**
- b) Differentiate between Rigid Coupling and Flexible Coupling. **04**
- c) Explain ASME code used for shaft design. **03**
- Q.6** a) Explain series and parallel springs for finding the Stiffness of Spring. **06**
- b) It is required to design a helical compression spring subjected to a maximum force of 1250 N. the deflection of the spring corresponding to the maximum force should be approximately 30 mm. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire. The ultimate tensile strength and modulus of rigidity of the spring material are 1090 and 81370 N/mm<sup>2</sup> respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Consider the spring has square and ground end. Design the spring and calculate:
- Wire diameter
  - Mean coil diameter
  - Number of active coils
  - Total number of coils
  - Free length of the spring
  - Pitch of the coil
- 08**
- Q.7** a) Derive the equation for Strength of butt welds. **04**
- b) An electric motor weighing 10 kN is lifted by means of an eye bolt as shown in Fig. The eye bolt is screwed into the frame of the motor. The eye bolt has coarse threads. It is made of plain carbon steel 30C8 ( $S_{yt} = 400 \text{ N/mm}^2$ ) and the factor of safety is 6. Determine the size of the bolt. **04**



- c) A plate, 75mm wide and 10mm thick, is joined with another steel plate by mean of single transverse and double parallel fillet welds, as shown in Fig. the joint is subjected to a maximum tensile force of 55 kN. The permissible tensile and shear stresses in the weld material are 70 and 50 N/mm<sup>2</sup> respectively. Determine the required length of each parallel fillet weld. Consider 15 mm of length for starting and stopping of the weld run. **06**



$\frac{D-d}{C}$	Arc of contact on smaller pulley (in degrees)	Correction Factor $F_d$
0.00	180	1.00
0.05	177	0.99
0.10	174	0.99
0.15	171	0.98
0.20	169	0.97
0.25	166	0.97
0.30	163	0.96
0.35	160	0.95
0.40	157	0.94
0.45	154	0.93
0.50	151	0.93
0.55	148	0.92
0.60	145	0.91
0.65	142	0.90
0.70	139	0.89
0.75	136	0.88
0.80	133	0.87
0.85	130	0.86
0.90	127	0.85
0.95	123	0.83
1.00	120	0.82

**Table 13.21** Connection factors for bolt pitch length ( $l$ )

$Z$	A	B	C	D	E
405	430	920	1360	2700	4660
475	700	1000	1700	3130	5640
530	790	1100	1950	3370	5420
625	890	1210	2150	3710	6100
700	990	1370	2420	4080	6850
790	1300	1560	2720	4620	7650
920	1250	1690	2850	5400	9150
1080	1430	1760	3080	6100	12220
1230	1530	1950	3310	6600	13750
1420	1640	2100	3520	7620	15280
1540	1790	2300	4060	8010	16800
	1940	2500	4600	9140	
	2080	2700	5300	10700	
	2200	2820	6300	12200	
	2300	3200	6820	13700	
	2400	3400	7600	15200	
	2570	4000	9100		
	2700	4400	10700		
	2910	4820			
	3080	5170			
	3280	6070			
	3540				

Contraction Factor	Body pitch length (mm)					
	Male crabs (section)					
	A	B	C	D	E	F
0.80		630				
0.81			950			
0.82		700		1500	2700	
0.83			1000			
0.84		780		1700		
0.85			1100			
0.86	400	800	1210	1900	4100	
0.88		990			4300	
0.90						
0.90	475	1100	1970	2400	3700	4000
0.91				2340		
0.92	530		1500	2400	4000	5000
0.93		1250				
0.94				2730	4600	5800
0.95	625		1700	2600		
0.96		1430		3000		6100
0.97			1900		5400	
0.98	700	1900		3300		
0.99		1640	2100	3520		6850
1.00	780	1750	2300		6100	
1.02		1940	2500	4000		7000
1.03					6000	
1.04	820	2050	2700			
1.05		2200	2900	4600	7600	9150
1.06		2300				
1.07	5000				8400	9950
1.08		2480	3200	5100		
1.09		2570			9100	10710
1.10		2700	3600			
1.11				6100		
1.12		2910			10700	12280
1.13		3080	4000			
1.14		3290		6850		13750
1.15				4430		
1.16		3540	4670	7600	12200	
1.17			5000		13700	15200
1.18			4500			

<b>Seat No.</b>	
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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

- 1) Which one of the following is an output device?  
a) Scanner  
b) Keyboard  
c) Drum plotter  
d) none of these
- 2) Which of the following is type of curve in geometric modeling?  
a) Bezier  
b) Benazir  
c) NURBS  
d) Both a) and c)
- 3) Reflection about X axis is  
a) Y flips  
b) X flips  
c) X-Y flips  
d) None of the above
- 4) If the no. of nodes increases,  
a) Accuracy decreases  
b) Accuracy increases  
c) Accuracy remains same  
d) None
- 5) In group technology, on part family is on collection of parts based on \_\_\_\_  
a) Shape  
b) Size  
c) Similar processing steps  
d) Any of these
- 6) ROBOT is example of  
a) Programmable automation  
b) Flexible automation  
c) Fixed automation  
d) All above
- 7) Stress analysis of spur gear can be conveniently done using software  
a) Ansys  
b) Pro-E  
c) Auto Cad  
d) Catia
- 8) The device used in NC machine tools to read a program on punched tape is called as  
a) Program scanner  
b) Program reader  
c) Punched tape reader  
d) None of these
- 9) Adaptive control system reduces  
a) Machining time  
b) Non-productive time  
c) Power output  
d) None of these

- 10)** The predefined sequence of movement of machine parts in CNC, stored in MCU is called as
- |                   |                     |
|-------------------|---------------------|
| a) Machine cycles | b) Operation cycles |
| c) Canned cycles  | d) None of these    |
- 11)** The part of CNC machine tool where multiple tools are stored is called as
- |                  |              |
|------------------|--------------|
| a) Tool magazine | b) Spindle   |
| c) Tool store    | d) Tool room |
- 12)** Miscellaneous command program stop in CNC is
- |        |        |
|--------|--------|
| a) M09 | b) M10 |
| c) M11 | d) M00 |
- 13)** G71 preparatory code is used for
- |                        |                                |
|------------------------|--------------------------------|
| a) Absolute presetting | b) Absolute coordinate setting |
| c) Metric unit setting | d) none of these               |
- 14)** G03 code in part programming is used for
- |                            |                                |
|----------------------------|--------------------------------|
| a) Linear movement         | b) Rapid movement              |
| c) Interpolation clockwise | d) Interpolation anticlockwise |

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM & CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

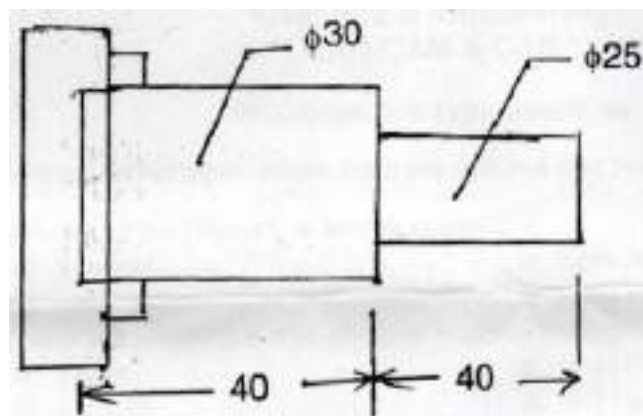
**Instructions:** 1) Attempt any two questions from each section i.e. Section I & Section II.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2** a) Explain product cycle with CAD/CAM. **07**  
 b) What is automation? Discuss its nature in today's context in industry. **07**
- Q.3** a) Translate a triangle with coordinates A (3,5) B (3,8) and C (7,5) by 7 units in x direction and 2 units in Y direction and then to be rotate it by 90 degree at point A. Show and explain Graphical Representation clearly. **07**  
 b) General steps used in FEM and explain it in short. **07**
- Q.4** **Solve any four of the following questions.** **14**  
 a) Group Technology  
 b) CAD/CAM Data Exchange  
 c) FEM  
 d) Bezier curve  
 e) Integration of CAD and CAM

**Section – II**

- Q.5** a) Prepare a part program using G and M codes for stepped component given below. The various details are: **07**  
 Work material : Aluminum      Tool Material : HSS  
 Work piece size :  $\phi$  30 x 80      Spindle speed : 200 rpm  
 Feed rate: 200 mm/min      All dimensions are in mm



- b) Differentiate between NC and CNC machine tools. **07**

- Q.6**   **a)**   What is part programming? Explain the procedure associated with NC part programming.      **07**
- b)**   What is the concept of DNC? Discuss its advantages and limitations.      **07**
- Q.7**   **Answer the following questions. (Any Four)**      **14**
- a)**   FMS
- b)**   Pallets
- c)**   Adaptive control
- d)**   Enlist and explain any four M Codes
- e)**   ATS

Seat No.	
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Set Q
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM & CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The device used in NC machine tools to read a program on punched tape is called as
 

a) Program scanner	b) Program reader
c) Punched tape reader	d) None of these
- 2) Adaptive control system reduces
 

a) Machining time	b) Non-productive time
c) Power output	d) None of these
- 3) The predefined sequence of movement of machine parts in CNC, stored in MCU is called as
 

a) Machine cycles	b) Operation cycles
c) Canned cycles	d) None of these
- 4) The part of CNC machine tool where multiple tools are stored is called as
 

a) Tool magazine	b) Spindle
c) Tool store	d) Tool room
- 5) Miscellaneous command program stop in CNC is
 

a) M09	b) M10
c) M11	d) M00
- 6) G71 preparatory code is used for
 

a) Absolute presetting	b) Absolute coordinate setting
c) Metric unit setting	d) none of these
- 7) G03 code in part programming is used for
 

a) Linear movement	b) Rapid movement
c) Interpolation clockwise	d) Interpolation anticlockwise
- 8) Which one of the following is an output device?
 

a) Scanner	b) Keyboard
c) Drum plotter	d) none of these
- 9) Which of the following is type of curve in geometric modeling?
 

a) Bezier	b) Benazir
c) NURBS	d) Both a) and c)



- 10)** Reflection about X axis is  
a) Y flips  
b) X flips  
c) X-Y flips  
d) None of the above
- 11)** If the no. of nodes increases,  
a) Accuracy decreases  
b) Accuracy increases  
c) Accuracy remains same  
d) None
- 12)** In group technology, on part family is on collection of parts based on \_\_\_\_  
a) Shape  
b) Size  
c) Similar processing steps  
d) Any of these
- 13)** ROBOT is example of  
a) Programmable automation  
b) Flexible automation  
c) Fixed automation  
d) All above
- 14)** Stress analysis of spur gear can be conveniently done using software  
a) Ansys  
b) Pro-E  
c) Auto Cad  
d) Catia

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM & CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

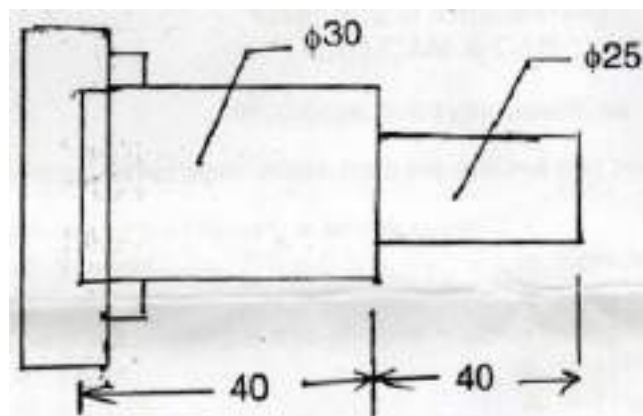
**Instructions:** 1) Attempt any two questions from each section i.e. Section I & Section II.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2** a) Explain product cycle with CAD/CAM. **07**  
 b) What is automation? Discuss its nature in today's context in industry. **07**
- Q.3** a) Translate a triangle with coordinates A (3,5) B (3,8) and C (7,5) by 7 units in x direction and 2 units in Y direction and then to be rotate it by 90 degree at point A. Show and explain Graphical Representation clearly. **07**  
 b) General steps used in FEM and explain it in short. **07**
- Q.4** **Solve any four of the following questions.** **14**  
 a) Group Technology  
 b) CAD/CAM Data Exchange  
 c) FEM  
 d) Bezier curve  
 e) Integration of CAD and CAM

**Section – II**

- Q.5** a) Prepare a part program using G and M codes for stepped component given below. The various details are: **07**  
 Work material : Aluminum      Tool Material : HSS  
 Work piece size :  $\phi$  30 x 80      Spindle speed : 200 rpm  
 Feed rate: 200 mm/min      All dimensions are in mm



- b) Differentiate between NC and CNC machine tools. **07**

- Q.6**
- a) What is part programming? Explain the procedure associated with NC part programming. **07**
  - b) What is the concept of DNC? Discuss its advantages and limitations. **07**
- Q.7** **Answer the following questions. (Any Four)** **14**
- a) FMS
  - b) Pallets
  - c) Adaptive control
  - d) Enlist and explain any four M Codes
  - e) ATS

Seat No.	
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Set R
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM & CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The part of CNC machine tool where multiple tools are stored is called as
  - a) Tool magazine
  - b) Spindle
  - c) Tool store
  - d) Tool room
- 2) Miscellaneous command program stop in CNC is
  - a) M09
  - b) M10
  - c) M11
  - d) M00
- 3) G71 preparatory code is used for
  - a) Absolute presetting
  - b) Absolute coordinate setting
  - c) Metric unit setting
  - d) none of these
- 4) G03 code in part programming is used for
  - a) Linear movement
  - b) Rapid movement
  - c) Interpolation clockwise
  - d) Interpolation anticlockwise
- 5) Which one of the following is an output device?
  - a) Scanner
  - b) Keyboard
  - c) Drum plotter
  - d) none of these
- 6) Which of the following is type of curve in geometric modeling?
  - a) Bezier
  - b) Benazir
  - c) NURBS
  - d) Both a) and c)
- 7) Reflection about X axis is
  - a) Y flips
  - b) X flips
  - c) X-Y flips
  - d) None of the above
- 8) If the no. of nodes increases,
  - a) Accuracy decreases
  - b) Accuracy increases
  - c) Accuracy remains same
  - d) None
- 9) In group technology, on part family is on collection of parts based on \_\_\_\_
  - a) Shape
  - b) Size
  - c) Similar processing steps
  - d) Any of these
- 10) ROBOT is example of
  - a) Programmable automation
  - b) Flexible automation
  - c) Fixed automation
  - d) All above

- 11)** Stress analysis of spur gear can be conveniently done using software
- |             |          |
|-------------|----------|
| a) Ansys    | b) Pro-E |
| c) Auto Cad | d) Catia |
- 12)** The device used in NC machine tools to read a program on punched tape is called as
- |                        |                   |
|------------------------|-------------------|
| a) Program scanner     | b) Program reader |
| c) Punched tape reader | d) None of these  |
- 13)** Adaptive control system reduces
- |                   |                        |
|-------------------|------------------------|
| a) Machining time | b) Non-productive time |
| c) Power output   | d) None of these       |
- 14)** The predefined sequence of movement of machine parts in CNC, stored in MCU is called as
- |                   |                     |
|-------------------|---------------------|
| a) Machine cycles | b) Operation cycles |
| c) Canned cycles  | d) None of these    |

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM & CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

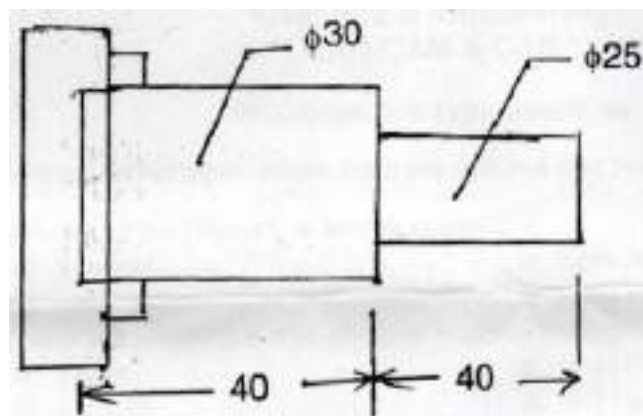
**Instructions:** 1) Attempt any two questions from each section i.e. Section I & Section II.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2** a) Explain product cycle with CAD/CAM. **07**  
 b) What is automation? Discuss its nature in today's context in industry. **07**
- Q.3** a) Translate a triangle with coordinates A (3,5) B (3,8) and C (7,5) by 7 units in x direction and 2 units in Y direction and then to be rotate it by 90 degree at point A. Show and explain Graphical Representation clearly. **07**  
 b) General steps used in FEM and explain it in short. **07**
- Q.4** **Solve any four of the following questions.** **14**  
 a) Group Technology  
 b) CAD/CAM Data Exchange  
 c) FEM  
 d) Bezier curve  
 e) Integration of CAD and CAM

**Section – II**

- Q.5** a) Prepare a part program using G and M codes for stepped component given below. The various details are: **07**  
 Work material : Aluminum      Tool Material : HSS  
 Work piece size :  $\phi$  30 x 80      Spindle speed : 200 rpm  
 Feed rate: 200 mm/min      All dimensions are in mm



- b) Differentiate between NC and CNC machine tools. **07**

- Q.6**
- a) What is part programming? Explain the procedure associated with NC part programming. **07**
  - b) What is the concept of DNC? Discuss its advantages and limitations. **07**
- Q.7** **Answer the following questions. (Any Four)** **14**
- a) FMS
  - b) Pallets
  - c) Adaptive control
  - d) Enlist and explain any four M Codes
  - e) ATS

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM & CAE**

Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) ROBOT is example of
  - a) Programmable automation
  - b) Flexible automation
  - c) Fixed automation
  - d) All above
- 2) Stress analysis of spur gear can be conveniently done using software
  - a) Ansys
  - b) Pro-E
  - c) Auto Cad
  - d) Catia
- 3) The device used in NC machine tools to read a program on punched tape is called as
  - a) Program scanner
  - b) Program reader
  - c) Punched tape reader
  - d) None of these
- 4) Adaptive control system reduces
  - a) Machining time
  - b) Non-productive time
  - c) Power output
  - d) None of these
- 5) The predefined sequence of movement of machine parts in CNC, stored in MCU is called as
  - a) Machine cycles
  - b) Operation cycles
  - c) Canned cycles
  - d) None of these
- 6) The part of CNC machine tool where multiple tools are stored is called as
  - a) Tool magazine
  - b) Spindle
  - c) Tool store
  - d) Tool room
- 7) Miscellaneous command program stop in CNC is
  - a) M09
  - b) M10
  - c) M11
  - d) M00
- 8) G71 preparatory code is used for
  - a) Absolute presetting
  - b) Absolute coordinate setting
  - c) Metric unit setting
  - d) none of these
- 9) G03 code in part programming is used for
  - a) Linear movement
  - b) Rapid movement
  - c) Interpolation clockwise
  - d) Interpolation anticlockwise



- 10) Which one of the following is an output device?
  - a) Scanner
  - b) Keyboard
  - c) Drum plotter
  - d) none of these
- 11) Which of the following is type of curve in geometric modeling?
  - a) Bezier
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  - c) NURBS
  - d) Both a) and c)
- 12) Reflection about X axis is
  - a) Y flips
  - b) X flips
  - c) X-Y flips
  - d) None of the above
- 13) If the no. of nodes increases,
  - a) Accuracy decreases
  - b) Accuracy increases
  - c) Accuracy remains same
  - d) None
- 14) In group technology, on part family is on collection of parts based on \_\_\_\_
  - a) Shape
  - b) Size
  - c) Similar processing steps
  - d) Any of these

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**CAD-CAM & CAE**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

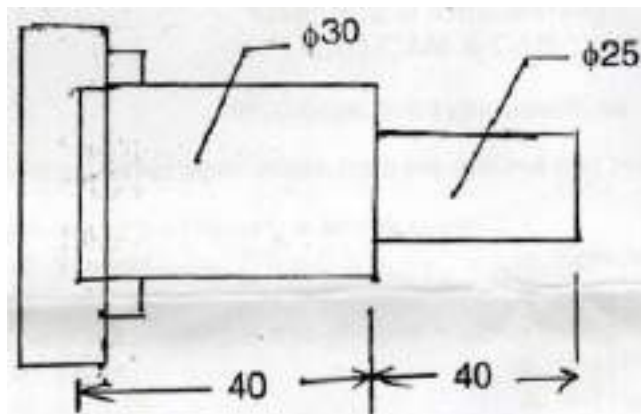
**Instructions:** 1) Attempt any two questions from each section i.e. Section I & Section II.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2** a) Explain product cycle with CAD/CAM. **07**  
 b) What is automation? Discuss its nature in today's context in industry. **07**
- Q.3** a) Translate a triangle with coordinates A (3,5) B (3,8) and C (7,5) by 7 units in x direction and 2 units in Y direction and then to be rotate it by 90 degree at point A. Show and explain Graphical Representation clearly. **07**  
 b) General steps used in FEM and explain it in short. **07**
- Q.4** **Solve any four of the following questions.** **14**  
 a) Group Technology  
 b) CAD/CAM Data Exchange  
 c) FEM  
 d) Bezier curve  
 e) Integration of CAD and CAM

**Section – II**

- Q.5** a) Prepare a part program using G and M codes for stepped component given below. The various details are: **07**  
 Work material : Aluminum      Tool Material : HSS  
 Work piece size :  $\phi$  30 x 80      Spindle speed : 200 rpm  
 Feed rate: 200 mm/min      All dimensions are in mm



- b) Differentiate between NC and CNC machine tools. **07**

- Q.6**
- a) What is part programming? Explain the procedure associated with NC part programming. **07**
  - b) What is the concept of DNC? Discuss its advantages and limitations. **07**
- Q.7** **Answer the following questions. (Any Four)** **14**
- a) FMS
  - b) Pallets
  - c) Adaptive control
  - d) Enlist and explain any four M Codes
  - e) ATS

Seat No.	
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Set	P
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**T. Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Which of the following methods of powder manufacture is regarded as mechanical method of powder manufacture?
  - a) Reduction
  - b) condensation
  - c) Milling
  - d) none of these
- 2) Which of the following component is manufactured by powder metallurgy?
  - a) Ball bearing
  - b) Clutch lever
  - c) Torch nozzle
  - d) Tungsten filament
- 3) Which of the following methods of powder manufacture is regarded as chemical process of powder manufacture?
  - a) Reduction
  - b) condensation
  - c) Milling
  - d) none of these
- 4) Annealing Heat Treatment is used to \_\_\_\_\_.
  - a) get fine pearlite
  - b) get coarse pearlite
  - c) get martensite
  - d) get bainite
- 5) Martensite is having \_\_\_\_\_ crystal structure.
  - a) BCC
  - b) FCC
  - c) BCT
  - d) HCP
- 6) Retained Austenite can be completely removed by \_\_\_\_\_.
  - a) Sub zero treatment
  - b) Annealing
  - c) Normalizing
  - d) Martempering
- 7) The medium used in gas nitriding is \_\_\_\_\_.
  - a) ammonia
  - b) butane
  - c) propane
  - d) none of these
- 8) Behavior of material under constant load with respect to time is determined in \_\_\_\_\_ test.
  - a) Tensile test
  - b) Fatigue test
  - c) creep test
  - d) Hardness test

- 9) True toughness of material can be measured by\_\_\_\_\_
- |                |                 |
|----------------|-----------------|
| a) Impact test | b) Tensile test |
| c) Creep test  | d) Fatigue test |
- 10) Al-Si alloys are given \_\_\_\_\_
- |                             |                            |
|-----------------------------|----------------------------|
| a) Modification treatment   | b) Precipitation treatment |
| c) Malleabilizing treatment | d) None                    |
- 11) Pearlite is product of \_\_\_\_\_ transformation.
- |               |               |
|---------------|---------------|
| a) Monotectic | b) Eutectoid  |
| c) Eutectic   | d) Peritectic |
- 12) Tin is having \_\_\_\_\_ structure.
- |        |        |
|--------|--------|
| a) BCC | b) BCT |
| c) HCP | d) FCC |
- 13) Which of the following phases present in Fe-Fe<sub>3</sub>C diagram have FCC structure?
- |                  |                  |
|------------------|------------------|
| a) Alpha ferrite | b) Delta ferrite |
| c) Cementite     | d) Austenite     |
- 14) Which of the following steel contains tungsten as alloying element?
- |                          |         |
|--------------------------|---------|
| a) HSLA steel            | b) HSS  |
| c) Water hardening steel | d) None |

Seat No.	
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Set

P

**T. Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Figures to the right indicate full marks.  
 3) Use of scientific calculator is allowed.

**Section – I**

- Q.2** a) Draw Fe-Fe<sub>3</sub>C equilibrium diagram. Label all the temperatures & constituents. **06**  
 b) With the help of above diagram, explain the slow cooling of 0.2% carbon steel & draw the microstructure of this steel. **06**  
 c) Explain (i) A1 temperature (ii) A3 temperature. **02**
- Q.3** a) Give typical composition, properties & applications of Any 5 of the following. **10**  
 i) Hadfield Mn steel  
 ii) Ferritic Stainless steel  
 iii) HSS  
 iv) Naval Brass  
 v) Free cutting steel  
 vi) Muntz metal  
 vii) Spring steel  
 b) Explain the modification treatment given to Al-Si system. **04**
- Q.4** Answer the following (Any 4) **14**  
 a) Compare between Gray Cast Iron & White Cast Iron. **04**  
 b) Explain why Copper is an essential constituent of Babbitts. **03**  
 c) Draw neat sketch of Interstitial solid solution & Substitutional solid solution. **04**  
 d) What are composites? What are their applications? **03**  
 e) Explain the application of Lever arm principle. **03**

**Section – II**

- Q.5** a) Draw TTT diagram for eutectoid steel. **04**  
 b) Compare Annealing & Normalizing **04**  
 c) Explain the purposes of Tempering. **03**  
 d) Enlist various quenching media & their characteristics. **03**
- Q.6** a) Explain the significance of Hardenability? Which factors improve hardenability? **03**  
 b) Compare between Brinell & Rockwell hardness Tests **04**  
 c) Explain why OHNS steels are subjected to subzero treatment. **03**  
 d) Draw the typical flow chart for manufacturing of self-lubricated bearing by Powder metallurgy **04**

- Q.7**
- a)** Discuss various methods of Powder manufacturing.
  - b)** Explain X-ray radiography test with neat sketch.
  - c)** Explain Eddy current test with neat sketch.
  - d)** Write a note on Tensile testing

**03**  
**04**  
**04**  
**03**

Seat No.	
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Set Q
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**T. Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Behavior of material under constant load with respect to time is determined in \_\_\_\_ test.
  - a) Tensile test
  - b) Fatigue test
  - c) creep test
  - d) Hardness test
- 2) True toughness of material can be measured by \_\_\_\_
  - a) Impact test
  - b) Tensile test
  - c) Creep test
  - d) Fatigue test
- 3) Al-Si alloys are given \_\_\_\_
  - a) Modification treatment
  - b) Precipitation treatment
  - c) Malleabilizing treatment
  - d) None
- 4) Pearlite is product of \_\_\_\_ transformation.
  - a) Monotectic
  - b) Eutectoid
  - c) Eutectic
  - d) Peritectic
- 5) Tin is having \_\_\_\_ structure.
  - a) BCC
  - b) BCT
  - c) HCP
  - d) FCC
- 6) Which of the following phases present in Fe-Fe<sub>3</sub>C diagram have FCC structure?
  - a) Alpha ferrite
  - b) Delta ferrite
  - c) Cementite
  - d) Austenite
- 7) Which of the following steel contains tungsten as alloying element?
  - a) HSLA steel
  - b) HSS
  - c) Water hardening steel
  - d) None
- 8) Which of the following methods of powder manufacture is regarded as mechanical method of powder manufacture?
  - a) Reduction
  - b) condensation
  - c) Milling
  - d) none of these
- 9) Which of the following component is manufactured by powder metallurgy?
  - a) Ball bearing
  - b) Clutch lever
  - c) Torch nozzle
  - d) Tungsten filament



- 10)** Which of the following methods of powder manufacture is regarded as chemical process of powder manufacture?
- a) Reduction
  - b) condensation
  - c) Milling
  - d) none of these
- 11)** Annealing Heat Treatment is used to\_\_\_\_\_
- a) get fine pearlite
  - b) get coarse pearlite
  - c) get martensite
  - d) get bainite
- 12)** Martensite is having\_\_\_\_\_ crystal structure.
- a) BCC
  - b) FCC
  - c) BCT
  - d) HCP
- 13)** Retained Austenite can be completely removed by\_\_\_\_\_.
- a) Sub zero treatment
  - b) Annealing
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  - d) Martempering
- 14)** The medium used in gas nitriding is\_\_\_\_\_
- a) ammonia
  - b) butane
  - c) propane
  - d) none of these

Seat No.	
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Set	Q
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**T. Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each Section.  
 2) Figures to the right indicate full marks.  
 3) Use of scientific calculator is allowed.

**Section – I**

- Q.2** a) Draw Fe-Fe<sub>3</sub>C equilibrium diagram. Label all the temperatures & constituents. **06**  
 b) With the help of above diagram, explain the slow cooling of 0.2% carbon steel & draw the microstructure of this steel. **06**  
 c) Explain (i) A1 temperature (ii) A3 temperature. **02**
- Q.3** a) Give typical composition, properties & applications of Any 5 of the following. **10**  
 i) Hadfield Mn steel  
 ii) Ferritic Stainless steel  
 iii) HSS  
 iv) Naval Brass  
 v) Free cutting steel  
 vi) Muntz metal  
 vii) Spring steel  
 b) Explain the modification treatment given to Al-Si system. **04**
- Q.4** Answer the following (Any 4) **14**  
 a) Compare between Gray Cast Iron & White Cast Iron. **04**  
 b) Explain why Copper is an essential constituent of Babbitts. **03**  
 c) Draw neat sketch of Interstitial solid solution & Substitutional solid solution. **04**  
 d) What are composites? What are their applications? **03**  
 e) Explain the application of Lever arm principle. **03**

**Section – II**

- Q.5** a) Draw TTT diagram for eutectoid steel. **04**  
 b) Compare Annealing & Normalizing **04**  
 c) Explain the purposes of Tempering. **03**  
 d) Enlist various quenching media & their characteristics. **03**
- Q.6** a) Explain the significance of Hardenability? Which factors improve hardenability? **03**  
 b) Compare between Brinell & Rockwell hardness Tests **04**  
 c) Explain why OHNS steels are subjected to subzero treatment. **03**  
 d) Draw the typical flow chart for manufacturing of self-lubricated bearing by Powder metallurgy **04**

- Q.7**
- a)** Discuss various methods of Powder manufacturing.
  - b)** Explain X-ray radiography test with neat sketch.
  - c)** Explain Eddy current test with neat sketch.
  - d)** Write a note on Tensile testing

**03**  
**04**  
**04**  
**03**

Seat No.	
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Set	R
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**T. Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Pearlite is product of \_\_\_\_\_ transformation.
  - a) Monotectic
  - b) Eutectoid
  - c) Eutectic
  - d) Peritectic
- 2) Tin is having \_\_\_\_\_ structure.
  - a) BCC
  - b) BCT
  - c) HCP
  - d) FCC
- 3) Which of the following phases present in Fe-Fe<sub>3</sub>C diagram have FCC structure?
  - a) Alpha ferrite
  - b) Delta ferrite
  - c) Cementite
  - d) Austenite
- 4) Which of the following steel contains tungsten as alloying element?
  - a) HSLA steel
  - b) HSS
  - c) Water hardening steel
  - d) None
- 5) Which of the following methods of powder manufacture is regarded as mechanical method of powder manufacture?
  - a) Reduction
  - b) condensation
  - c) Milling
  - d) none of these
- 6) Which of the following component is manufactured by powder metallurgy?
  - a) Ball bearing
  - b) Clutch lever
  - c) Torch nozzle
  - d) Tungsten filament
- 7) Which of the following methods of powder manufacture is regarded as chemical process of powder manufacture?
  - a) Reduction
  - b) condensation
  - c) Milling
  - d) none of these
- 8) Annealing Heat Treatment is used to \_\_\_\_\_.
  - a) get fine pearlite
  - b) get coarse pearlite
  - c) get martensite
  - d) get bainite



Seat No.	
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Set **R**

**T. Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each Section.  
 2) Figures to the right indicate full marks.  
 3) Use of scientific calculator is allowed.

**Section – I**

- Q.2** a) Draw Fe-Fe<sub>3</sub>C equilibrium diagram. Label all the temperatures & constituents. **06**  
 b) With the help of above diagram, explain the slow cooling of 0.2% carbon steel & draw the microstructure of this steel. **06**  
 c) Explain (i) A1 temperature (ii) A3 temperature. **02**
- Q.3** a) Give typical composition, properties & applications of Any 5 of the following. **10**  
 i) Hadfield Mn steel  
 ii) Ferritic Stainless steel  
 iii) HSS  
 iv) Naval Brass  
 v) Free cutting steel  
 vi) Muntz metal  
 vii) Spring steel  
 b) Explain the modification treatment given to Al-Si system. **04**
- Q.4** Answer the following (Any 4) **14**  
 a) Compare between Gray Cast Iron & White Cast Iron. **04**  
 b) Explain why Copper is an essential constituent of Babbitts. **03**  
 c) Draw neat sketch of Interstitial solid solution & Substitutional solid solution. **04**  
 d) What are composites? What are their applications? **03**  
 e) Explain the application of Lever arm principle. **03**

**Section – II**

- Q.5** a) Draw TTT diagram for eutectoid steel. **04**  
 b) Compare Annealing & Normalizing **04**  
 c) Explain the purposes of Tempering. **03**  
 d) Enlist various quenching media & their characteristics. **03**
- Q.6** a) Explain the significance of Hardenability? Which factors improve hardenability? **03**  
 b) Compare between Brinell & Rockwell hardness Tests **04**  
 c) Explain why OHNS steels are subjected to subzero treatment. **03**  
 d) Draw the typical flow chart for manufacturing of self-lubricated bearing by Powder metallurgy **04**

- Q.7**
- a)** Discuss various methods of Powder manufacturing.
  - b)** Explain X-ray radiography test with neat sketch.
  - c)** Explain Eddy current test with neat sketch.
  - d)** Write a note on Tensile testing

**03**  
**04**  
**04**  
**03**

Seat No.	
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Set	S
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**T. Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Retained Austenite can be completely removed by \_\_\_\_\_.  
 a) Sub zero treatment                      b) Annealing  
 c) Normalizing                                d) Martempering
- 2) The medium used in gas nitriding is \_\_\_\_\_.  
 a) ammonia                                      b) butane  
 c) propane                                        d) none of these
- 3) Behavior of material under constant load with respect to time is determined in \_\_\_\_ test.  
 a) Tensile test                                    b) Fatigue test  
 c) creep test                                      d) Hardness test
- 4) True toughness of material can be measured by \_\_\_\_\_.  
 a) Impact test                                    b) Tensile test  
 c) Creep test                                      d) Fatigue test
- 5) Al-Si alloys are given \_\_\_\_\_.  
 a) Modification treatment                      b) Precipitation treatment  
 c) Malleabilizing treatment                      d) None
- 6) Pearlite is product of \_\_\_\_\_ transformation.  
 a) Monotectic                                      b) Eutectoid  
 c) Eutectic                                         d) Peritectic
- 7) Tin is having \_\_\_\_\_ structure.  
 a) BCC    b) BCT  
 c) HCP    d) FCC
- 8) Which of the following phases present in Fe-Fe<sub>3</sub>C diagram have FCC structure?  
 a) Alpha ferrite                                    b) Delta ferrite  
 c) Cementite                                        d) Austenite
- 9) Which of the following steel contains tungsten as alloying element?  
 a) HSLA steel                                      b) HSS  
 c) Water hardening steel                      d) None



- 10)** Which of the following methods of powder manufacture is regarded as mechanical method of powder manufacture?
- a) Reduction
  - b) condensation
  - c) Milling
  - d) none of these
- 11)** Which of the following component is manufactured by powder metallurgy?
- a) Ball bearing
  - b) Clutch lever
  - c) Torch nozzle
  - d) Tungsten filament
- 12)** Which of the following methods of powder manufacture is regarded as chemical process of powder manufacture?
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- 13)** Annealing Heat Treatment is used to\_\_\_\_\_
- a) get fine pearlite
  - b) get coarse pearlite
  - c) get martensite
  - d) get bainite
- 14)** Martensite is having\_\_\_\_\_ crystal structure.
- a) BCC
  - b) FCC
  - c) BCT
  - d) HCP

Seat No.	
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Set **S**

**T. Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Metallurgy**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each Section.  
 2) Figures to the right indicate full marks.  
 3) Use of scientific calculator is allowed.

**Section – I**

- Q.2** a) Draw Fe-Fe<sub>3</sub>C equilibrium diagram. Label all the temperatures & constituents. **06**  
 b) With the help of above diagram, explain the slow cooling of 0.2% carbon steel & draw the microstructure of this steel. **06**  
 c) Explain (i) A1 temperature (ii) A3 temperature. **02**
- Q.3** a) Give typical composition, properties & applications of Any 5 of the following. **10**  
 i) Hadfield Mn steel  
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 iii) HSS  
 iv) Naval Brass  
 v) Free cutting steel  
 vi) Muntz metal  
 vii) Spring steel  
 b) Explain the modification treatment given to Al-Si system. **04**
- Q.4** Answer the following (Any 4) **14**  
 a) Compare between Gray Cast Iron & White Cast Iron. **04**  
 b) Explain why Copper is an essential constituent of Babbitts. **03**  
 c) Draw neat sketch of Interstitial solid solution & Substitutional solid solution. **04**  
 d) What are composites? What are their applications? **03**  
 e) Explain the application of Lever arm principle. **03**

**Section – II**

- Q.5** a) Draw TTT diagram for eutectoid steel. **04**  
 b) Compare Annealing & Normalizing **04**  
 c) Explain the purposes of Tempering. **03**  
 d) Enlist various quenching media & their characteristics. **03**
- Q.6** a) Explain the significance of Hardenability? Which factors improve hardenability? **03**  
 b) Compare between Brinell & Rockwell hardness Tests **04**  
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 d) Draw the typical flow chart for manufacturing of self-lubricated bearing by Powder metallurgy **04**

- Q.7**
- a)** Discuss various methods of Powder manufacturing.
  - b)** Explain X-ray radiography test with neat sketch.
  - c)** Explain Eddy current test with neat sketch.
  - d)** Write a note on Tensile testing

**03**  
**04**  
**04**  
**03**

\_\_\_\_\_

**\$9**

# Industrial Engineering and Operation Research

Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

14

- Page 1 of 16



Seat No.	
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Set	P
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Industrial Engineering and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Attempt any Two Questions form Section I and II  
 2) Figures to right indicate full marks.  
 4) Make suitable assumptions if required.

**Section – I**

- Q.2** a) Define productivity and explain different factors affecting on productivity. **07**  
 b) Explain basic procedure and steps in work study. **07**
- Q.3** a) What is meant by micromotion study and explain SIMO chart? **07**  
 b) Explain with figure multiple activity chart. **07**
- Q.4** a) The observed time and performance rating of a time study is given below **07**
- | Element              | 1   | 2    | 3   | 4    | 5    |
|----------------------|-----|------|-----|------|------|
| Observed time (min.) | 0.2 | 0.08 | 0.6 | 0.12 | 0.10 |
| Performance rating   | 85  | 80   | 90  | 85   | 80   |
- Assume: Relax allowance 15%  
 Contingency allowance 2%  
 Calculate std. time/PC.
- b) List the various methods of job evaluation and explain any one. **07**

**Section – II**

- Q.5** a) Write in brief on types of OR models. **07**  
 b) Solve following LPP by Graphical Method. **07**
- Maximize  $Z = 8x_1 + 6x_2$
- s. t.  $4x_1 + 2x_2 \leq 60$   
 $2x_1 + 4x_2 \leq 48$   
 $x_1, x_2 \geq 0$
- Q.6** a) Solve the following assignment problem for minimizing the total cost of assigning workers to jobs. **07**

Jobs

	1	2	3	4	5
1	35	30	18	11	24
2	32	33	21	10	21
3	24	27	29	22	11
4	9	8	28	35	26
5	26	19	17	24	11

Workers

- b)** Solve the following transportation problem using LCM method to minimize total cost. **07**

		Destination				
		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	↓ Supply
S <sub>1</sub>		5	3	6	4	30
S <sub>2</sub>		3	4	7	8	15
S <sub>3</sub>		9	6	5	8	15
Demand →		10	25	18	7	

- Q.7 a)** A certain project has the following data: **07**

Activity	Time in months
1 - 2	2
1 - 3	2
1 - 4	1
2 - 5	4
3 - 6	8
3 - 7	5
4 - 6	3
5 - 8	1
6 - 9	5
7 - 8	4
8 - 9	3

- Construct the network
  - Determine critical path and its duration
  - Discuss the importance of float.
- b)** Compare PERT and CPM. **07**

Seat No.	
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Set Q
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Industrial Engineering and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Operations Research cannot give perfect \_\_\_\_\_ to problems.
 

a) Answers	b) Solutions
c) Both A and B	d) Decisions
- 2) A feasible solution to LPP \_\_\_\_\_.
 

a) Must satisfy all constraints
b) Need not satisfy all constraints
c) Must be corner point of feasible region
d) Must optimize objective function
- 3) The northwest corner rule requires that we start allocating units to shipping routes in the:
 

a) Lower right corner of the table
b) Upper right corner of the table
c) Highest costly cell of the table
d) Upper left-hand corner of the table
- 4) Which of the following is used to come up with a solution to the assignment problem?
 

a) MODI method
b) Northwest corner method
c) Stepping-stone method
d) Hungarian method
- 5) An objective function is maximized when it is a \_\_\_\_\_ function.
 

a) Passive	b) Profit
c) Cost	d) None of the above
- 6) In a project network, the critical path \_\_\_\_\_.
 

a) May be the shortest path
b) Is the longest path
c) May be longest path
d) Is the shortest path



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Seat No.	
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Set Q
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Industrial Engineering and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Attempt any Two Questions form Section I and II  
 2) Figures to right indicate full marks.  
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**Section – I**

- Q.2** a) Define productivity and explain different factors affecting on productivity. **07**  
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 b) Explain with figure multiple activity chart. **07**
- Q.4** a) The observed time and performance rating of a time study is given below **07**
- |                      |     |      |     |      |      |
|----------------------|-----|------|-----|------|------|
| Element              | 1   | 2    | 3   | 4    | 5    |
| Observed time (min.) | 0.2 | 0.08 | 0.6 | 0.12 | 0.10 |
| Performance rating   | 85  | 80   | 90  | 85   | 80   |
- Assume: Relax allowance 15%  
 Contingency allowance 2%  
 Calculate std. time/PC.
- b) List the various methods of job evaluation and explain any one. **07**

**Section – II**

- Q.5** a) Write in brief on types of OR models. **07**  
 b) Solve following LPP by Graphical Method. **07**
- Maximize  $Z = 8x_1 + 6x_2$   
 s. t.  $4x_1 + 2x_2 \leq 60$   
 $2x_1 + 4x_2 \leq 48$   
 $x_1, x_2 \geq 0$
- Q.6** a) Solve the following assignment problem for minimizing the total cost of assigning workers to jobs. **07**

Jobs

Workers		1	2	3	4	5
	1	35	30	18	11	24
	2	32	33	21	10	21
	3	24	27	29	22	11
	4	9	8	28	35	26
	5	26	19	17	24	11

- b)** Solve the following transportation problem using LCM method to minimize total cost. **07**

		Destination				
		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	↓ Supply
S <sub>1</sub>		5	3	6	4	30
S <sub>2</sub>		3	4	7	8	15
S <sub>3</sub>		9	6	5	8	15
Demand →		10	25	18	7	

- Q.7 a)** A certain project has the following data: **07**

Activity	Time in months
1 - 2	2
1 - 3	2
1 - 4	1
2 - 5	4
3 - 6	8
3 - 7	5
4 - 6	3
5 - 8	1
6 - 9	5
7 - 8	4
8 - 9	3

- i) Construct the network  
 ii) Determine critical path and its duration  
 iii) Discuss the importance of float.
- b)** Compare PERT and CPM. **07**

Seat No.	
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Set R
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Industrial Engineering and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following is used to come up with a solution to the assignment problem?
  - a) MODI method
  - b) Northwest corner method
  - c) Stepping-stone method
  - d) Hungarian method
- 2) An objective function is maximized when it is a \_\_\_\_\_ function.
  - a) Passive
  - b) Profit
  - c) Cost
  - d) None of the above
- 3) In a project network, the critical path \_\_\_\_\_.
  - a) May be the shortest path
  - b) Is the longest path
  - c) May be longest path
  - d) Is the shortest path
- 4) Network models help in project management for \_\_\_\_\_.
  - a) Planning
  - b) Scheduling
  - c) Controlling
  - d) All of above
- 5) Productivity is defined as \_\_\_\_\_.
  - a)  $\frac{\text{Output}}{\text{Input}}$
  - b)  $\frac{\text{Input}}{\text{Output}}$
  - c)  $\text{Output} \times \text{Input}$
  - d) None of above
- 6) Gilberth contributed to \_\_\_\_\_.
  - a) Time study
  - b) Motion study
  - c) Project study
  - d) Value engg.
- 7) Method study symbol  $\nabla$  indicates \_\_\_\_\_.
  - a) Storage
  - b) Inspection
  - c) Operation
  - d) Delay

- Page 10 of 16

Seat No.	
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Set	R
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Industrial Engineering and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Attempt any Two Questions form Section I and II  
 2) Figures to right indicate full marks.  
 4) Make suitable assumptions if required.

**Section – I**

- Q.2** a) Define productivity and explain different factors affecting on productivity. **07**  
 b) Explain basic procedure and steps in work study. **07**
- Q.3** a) What is meant by micromotion study and explain SIMO chart? **07**  
 b) Explain with figure multiple activity chart. **07**
- Q.4** a) The observed time and performance rating of a time study is given below **07**
- | Element              | 1   | 2    | 3   | 4    | 5    |
|----------------------|-----|------|-----|------|------|
| Observed time (min.) | 0.2 | 0.08 | 0.6 | 0.12 | 0.10 |
| Performance rating   | 85  | 80   | 90  | 85   | 80   |
- Assume: Relax allowance 15%  
 Contingency allowance 2%  
 Calculate std. time/PC.
- b) List the various methods of job evaluation and explain any one. **07**

**Section – II**

- Q.5** a) Write in brief on types of OR models. **07**  
 b) Solve following LPP by Graphical Method. **07**
- Maximize  $Z = 8x_1 + 6x_2$
- s. t.  $4x_1 + 2x_2 \leq 60$   
 $2x_1 + 4x_2 \leq 48$   
 $x_1, x_2 \geq 0$
- Q.6** a) Solve the following assignment problem for minimizing the total cost of assigning workers to jobs. **07**

Jobs

Workers		1	2	3	4	5
	1	35	30	18	11	24
	2	32	33	21	10	21
	3	24	27	29	22	11
	4	9	8	28	35	26
	5	26	19	17	24	11

- b)** Solve the following transportation problem using LCM method to minimize total cost. **07**

		Destination				
		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	↓ Supply
S <sub>1</sub>		5	3	6	4	30
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S <sub>3</sub>		9	6	5	8	15
Demand →		10	25	18	7	

- Q.7 a)** A certain project has the following data: **07**

Activity	Time in months
1 - 2	2
1 - 3	2
1 - 4	1
2 - 5	4
3 - 6	8
3 - 7	5
4 - 6	3
5 - 8	1
6 - 9	5
7 - 8	4
8 - 9	3

- Construct the network
  - Determine critical path and its duration
  - Discuss the importance of float.
- b)** Compare PERT and CPM. **07**

Seat No.	
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Industrial Engineering and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
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  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Job evaluation is \_\_\_\_\_.
  - a) Worth of jobs
  - b) Skill required by a worker
  - c) Job assessment
  - d) Relative value of job
- 2) Merit rating is the method of determining worth of \_\_\_\_\_.
  - a) A job
  - b) An individual employee
  - c) A particular division in workshop
  - d) Machine
- 3) Operations Research cannot give perfect \_\_\_\_\_ to problems.
 

a) Answers	b) Solutions
c) Both A and B	d) Decisions
- 4) A feasible solution to LPP \_\_\_\_\_.
  - a) Must satisfy all constraints
  - b) Need not satisfy all constraints
  - c) Must be corner point of feasible region
  - d) Must optimize objective function
- 5) The northwest corner rule requires that we start allocating units to shipping routes in the:
  - a) Lower right corner of the table
  - b) Upper right corner of the table
  - c) Highest costly cell of the table
  - d) Upper left-hand corner of the table



- 6) Which of the following is used to come up with a solution to the assignment problem?
- a) MODI method
  - b) Northwest corner method
  - c) Stepping-stone method
  - d) Hungarian method
- 7) An objective function is maximized when it is a \_\_\_\_\_ function.
- a) Passive
  - b) Profit
  - c) Cost
  - d) None of the above
- 8) In a project network, the critical path \_\_\_\_\_.
- a) May be the shortest path
  - b) Is the longest path
  - c) May be longest path
  - d) Is the shortest path
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- a) Planning
  - b) Scheduling
  - c) Controlling
  - d) All of above
- 10) Productivity is defined as \_\_\_\_\_.
- a)  $\frac{\text{Output}}{\text{Input}}$
  - b)  $\frac{\text{Input}}{\text{Output}}$
  - c)  $\text{Output} \times \text{Input}$
  - d) None of above
- 11) Gilberth contributed to \_\_\_\_\_.
- a) Time study
  - b) Motion study
  - c) Project study
  - d) Value engg.
- 12) Method study symbol  $\nabla$  indicates \_\_\_\_\_.
- a) Storage
  - b) Inspection
  - c) Operation
  - d) Delay
- 13) SIMO chart used in \_\_\_\_\_.
- a) Time study
  - b) Micromotion study
  - c) Memo-motion study
  - d) Inventory control
- 14) Personal allowance for male worker is \_\_\_\_\_.
- a) 5%
  - b) 6%
  - c) 4%
  - d) 8%

Seat No.	
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**T. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Industrial Engineering and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Attempt any Two Questions form Section I and II  
 2) Figures to right indicate full marks.  
 4) Make suitable assumptions if required.

**Section – I**

- Q.2** a) Define productivity and explain different factors affecting on productivity. **07**  
 b) Explain basic procedure and steps in work study. **07**
- Q.3** a) What is meant by micromotion study and explain SIMO chart? **07**  
 b) Explain with figure multiple activity chart. **07**
- Q.4** a) The observed time and performance rating of a time study is given below **07**
- | Element              | 1   | 2    | 3   | 4    | 5    |
|----------------------|-----|------|-----|------|------|
| Observed time (min.) | 0.2 | 0.08 | 0.6 | 0.12 | 0.10 |
| Performance rating   | 85  | 80   | 90  | 85   | 80   |
- Assume: Relax allowance 15%  
 Contingency allowance 2%  
 Calculate std. time/PC.
- b) List the various methods of job evaluation and explain any one. **07**

**Section – II**

- Q.5** a) Write in brief on types of OR models. **07**  
 b) Solve following LPP by Graphical Method. **07**
- Maximize  $Z = 8x_1 + 6x_2$
- s. t.  $4x_1 + 2x_2 \leq 60$   
 $2x_1 + 4x_2 \leq 48$   
 $x_1, x_2 \geq 0$
- Q.6** a) Solve the following assignment problem for minimizing the total cost of assigning workers to jobs. **07**

Jobs

Workers		1	2	3	4	5
	1	35	30	18	11	24
	2	32	33	21	10	21
	3	24	27	29	22	11
	4	9	8	28	35	26
	5	26	19	17	24	11

- b)** Solve the following transportation problem using LCM method to minimize total cost. **07**

		Destination				
		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	↓ Supply
S <sub>1</sub>		5	3	6	4	30
S <sub>2</sub>		3	4	7	8	15
S <sub>3</sub>		9	6	5	8	15
Demand →		10	25	18	7	

- Q.7 a)** A certain project has the following data: **07**

Activity	Time in months
1 - 2	2
1 - 3	2
1 - 4	1
2 - 5	4
3 - 6	8
3 - 7	5
4 - 6	3
5 - 8	1
6 - 9	5
7 - 8	4
8 - 9	3

- Construct the network
  - Determine critical path and its duration
  - Discuss the importance of float.
- b)** Compare PERT and CPM. **07**

<b>Seat No.</b>	
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**Set****P****T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022****MECHANICAL ENGINEERING****Industrial Hydraulics & Pneumatics**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) Which type of motion is transmitted by hydraulic actuators?
  - a) Linear motion
  - b) Rotary motion
  - c) Both a and b
  - d) None of the above
- 2) Metallic Seals are suitable for
  - a) Low pressure system
  - b) High pressure and temperature system
  - c) Extremely low temperature application
  - d) Dynamic application
- 3) When is a pressure reducing valve used?
  - a) It is used when higher pressure than system pressure is required
  - b) It is used when lower pressure than system pressure is required
  - c) When absolutely zero pressure is required
  - d) All the above
- 4) Which of the following gas is used in gas charged accumulator?
  - a) Oxygen
  - b) Carbon dioxide
  - c) Nitrogen
  - d) All the above
- 5) In Bleed-off circuit rate of flow of oil is controlled
  - a) In the bypass line leading towards the tank
  - b) At inlet of the actuator
  - c) At outlet of the actuator
  - d) None of the above
- 6) Why the pilot operated check valve used in clamping operation?
  - a) To reduce leakage in spool valve
  - b) To avoid decrease in pressure during clamping
  - c) Both a. and b
  - d) None of the above

- 7) In counter balancing circuit holding pressure is used to
- a) To prevent falling of the load while descending
  - b) To allow falling of the load while descending
  - c) To prevent raising of the load while ascending
  - d) All of the above
- 8) The \_\_\_\_\_ converts the compressed air energy into mechanical energy in the form of force and linear movement in one direction only.
- a) Double-acting cylinder
  - b) Piston cylinders
  - c) Single-acting cylinder
  - d) Short-stroke cylinders
- 9) Where is an intercooler connected in a two stage compressor?
- a) Intercooler is connected after the two stage compressor
  - b) Intercooler is connected between the two stages of the compressor
  - c) Intercooler is connected before the two stage compressor
  - d) None of the above
- 10) Which of the following is a component used in air generation system?
- a) Pressure switch
  - b) Pressure gauge
  - c) Intercooler
  - d) Drier
- 11) Check valve is a type of
- a) Pressure reducing valve
  - b) Pressure relief valve
  - c) Directional control valve
  - d) None of the above
- 12) A pressure relief valve can be
- a) Direct operated
  - b) Pilot operated
  - c) Solenoid operated
  - d) All the above
- 13) Meter out circuit can be used for
- a) Opposing load
  - b) Running away load
  - c) Both a & b
  - d) None of above
- 14) Time delay valve is
- a) Pneumatic Flow Control Valve
  - b) Hydraulic Flow Control Valve
  - c) Pneumatic Pressure Control Valve
  - d) Hydraulic Pressure Control Valve

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory  
2) Figures to the right indicates full marks.  
3) Assume suitable data if necessary.  
4) Use of nonprogrammable calculator is allowed.

**Section – I**

- Q.2 Solve any Four of the Followings. 16**
- a) Explain cylinder cushioning effect in hydraulic system.
  - b) Explain construction and working of vane type pump.
  - c) Explain with neat sketch hydraulic intensifier.
  - d) Explain with neat sketch working of 3/2 spool type direction control valve.
  - e) Explain hydraulic circuit for sequencing of two cylinder.
- Q.3 Solve any two of the followings. 12**
- a) Define actuator. Explain with neat sketch and symbol tandem cylinder.
  - b) Explain construction and working of pressure compensated flow control valve.
  - c) Explain in detail the regenerative circuit in hydraulic application.

**Section – II**

- Q.4 Solve any Four of the Followings. (4\*4 Marks= 16 Marks) 16**
- a) Explain with a sketch construction & working of the gear type motor.
  - b) Classify the air compressor. Explain selection criteria of compressor.
  - c) Write short note on quick exhaust valve.
  - d) Explain in detail 5/2 direction control valve in pneumatics with symbol.
  - e) Explain with neat sketch time delay circuit.
- Q.5 Solve any two of the followings. 12**
- a) What is FRL unit? Explain with a neat sketch construction & working of air lubricator.
  - b) Sketch and explain pilot operated pressure relief valve with symbol.
  - c) Explain with neat sketch pneumatic meter out circuit of speed control.

Seat No.	
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Set Q
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The \_\_\_\_\_ converts the compressed air energy into mechanical energy in the form of force and linear movement in one direction only.
 

a) Double-acting cylinder	b) Piston cylinders
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- 2) Where is an intercooler connected in a two stage compressor?
 

a) Intercooler is connected after the two stage compressor
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- 3) Which of the following is a component used in air generation system?
 

a) Pressure switch	b) Pressure gauge
c) Intercooler	d) Drier
- 4) Check valve is a type of
 

a) Pressure reducing valve	b) Pressure relief valve
c) Directional control valve	d) None of the above
- 5) A pressure relief valve can be
 

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c) Solenoid operated	d) All the above
- 6) Meter out circuit can be used for
 

a) Opposing load	b) Running away load
c) Both a & b	d) None of above
- 7) Time delay valve is
 

a) Pneumatic Flow Control Valve
b) Hydraulic Flow Control Valve
c) Pneumatic Pressure Control Valve
d) Hydraulic Pressure Control Valve
- 8) Which type of motion is transmitted by hydraulic actuators?
 

a) Linear motion	b) Rotary motion
c) Both a and b	d) None of the above

- 9) Metallic Seals are suitable for
- a) Low pressure system
  - b) High pressure and temperature system
  - c) Extremely low temperature application
  - d) Dynamic application
- 10) When is a pressure reducing valve used?
- a) It is used when higher pressure than system pressure is required
  - b) It is used when lower pressure than system pressure is required
  - c) When absolutely zero pressure is required
  - d) All the above
- 11) Which of the following gas is used in gas charged accumulator?
- a) Oxygen
  - b) Carbon dioxide
  - c) Nitrogen
  - d) All the above
- 12) In Bleed-off circuit rate of flow of oil is controlled
- a) In the bypass line leading towards the tank
  - b) At inlet of the actuator
  - c) At outlet of the actuator
  - d) None of the above
- 13) Why the pilot operated check valve used in clamping operation?
- a) To reduce leakage in spool valve
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- 14) In counter balancing circuit holding pressure is used to
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**Set Q**

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory  
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**Section – I**

- Q.2 Solve any Four of the Followings. 16**
- a) Explain cylinder cushioning effect in hydraulic system.
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- a) Define actuator. Explain with neat sketch and symbol tandem cylinder.
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**Section – II**

- Q.4 Solve any Four of the Followings. (4\*4 Marks= 16 Marks) 16**
- a) Explain with a sketch construction & working of the gear type motor.
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  - e) Explain with neat sketch time delay circuit.
- Q.5 Solve any two of the followings. 12**
- a) What is FRL unit? Explain with a neat sketch construction & working of air lubricator.
  - b) Sketch and explain pilot operated pressure relief valve with symbol.
  - c) Explain with neat sketch pneumatic meter out circuit of speed control.

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Check valve is a type of
  - a) Pressure reducing valve
  - b) Pressure relief valve
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  - d) None of the above
- 2) A pressure relief valve can be
  - a) Direct operated
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  - c) Solenoid operated
  - d) All the above
- 3) Meter out circuit can be used for
  - a) Opposing load
  - b) Running away load
  - c) Both a & b
  - d) None of above
- 4) Time delay valve is
  - a) Pneumatic Flow Control Valve
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  - c) Pneumatic Pressure Control Valve
  - d) Hydraulic Pressure Control Valve
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- 8) Which of the following gas is used in gas charged accumulator?
  - a) Oxygen
  - b) Carbon dioxide
  - c) Nitrogen
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- 9) In Bleed-off circuit rate of flow of oil is controlled
- a) In the bypass line leading towards the tank
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  - b) To allow falling of the load while descending
  - c) To prevent raising of the load while ascending
  - d) All of the above
- 12) The \_\_\_\_\_ converts the compressed air energy into mechanical energy in the form of force and linear movement in one direction only.
- a) Double-acting cylinder
  - b) Piston cylinders
  - c) Single-acting cylinder
  - d) Short-stroke cylinders
- 13) Where is an intercooler connected in a two stage compressor?
- a) Intercooler is connected after the two stage compressor
  - b) Intercooler is connected between the two stages of the compressor
  - c) Intercooler is connected before the two stage compressor
  - d) None of the above
- 14) Which of the following is a component used in air generation system?
- a) Pressure switch
  - b) Pressure gauge
  - c) Intercooler
  - d) Drier

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory  
2) Figures to the right indicates full marks.  
3) Assume suitable data if necessary.  
4) Use of nonprogrammable calculator is allowed.

**Section – I**

**Q.2 Solve any Four of the Followings. 16**

- a) Explain cylinder cushioning effect in hydraulic system.
- b) Explain construction and working of vane type pump.
- c) Explain with neat sketch hydraulic intensifier.
- d) Explain with neat sketch working of 3/2 spool type direction control valve.
- e) Explain hydraulic circuit for sequencing of two cylinder.

**Q.3 Solve any two of the followings. 12**

- a) Define actuator. Explain with neat sketch and symbol tandem cylinder.
- b) Explain construction and working of pressure compensated flow control valve.
- c) Explain in detail the regenerative circuit in hydraulic application.

**Section – II**

**Q.4 Solve any Four of the Followings. (4\*4 Marks= 16 Marks) 16**

- a) Explain with a sketch construction & working of the gear type motor.
- b) Classify the air compressor. Explain selection criteria of compressor.
- c) Write short note on quick exhaust valve.
- d) Explain in detail 5/2 direction control valve in pneumatics with symbol.
- e) Explain with neat sketch time delay circuit.

**Q.5 Solve any two of the followings. 12**

- a) What is FRL unit? Explain with a neat sketch construction & working of air lubricator.
- b) Sketch and explain pilot operated pressure relief valve with symbol.
- c) Explain with neat sketch pneumatic meter out circuit of speed control.

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Why the pilot operated check valve used in clamping operation?
  - a) To reduce leakage in spool valve
  - b) To avoid decrease in pressure during clamping
  - c) Both a. and b
  - d) None of the above
- 2) In counter balancing circuit holding pressure is used to
  - a) To prevent falling of the load while descending
  - b) To allow falling of the load while descending
  - c) To prevent raising of the load while ascending
  - d) All of the above
- 3) The \_\_\_\_\_ converts the compressed air energy into mechanical energy in the form of force and linear movement in one direction only.
  - a) Double-acting cylinder
  - b) Piston cylinders
  - c) Single-acting cylinder
  - d) Short-stroke cylinders
- 4) Where is an intercooler connected in a two stage compressor?
  - a) Intercooler is connected after the two stage compressor
  - b) Intercooler is connected between the two stages of the compressor
  - c) Intercooler is connected before the two stage compressor
  - d) None of the above
- 5) Which of the following is a component used in air generation system?
  - a) Pressure switch
  - b) Pressure gauge
  - c) Intercooler
  - d) Drier
- 6) Check valve is a type of
  - a) Pressure reducing valve
  - b) Pressure relief valve
  - c) Directional control valve
  - d) None of the above
- 7) A pressure relief valve can be
  - a) Direct operated
  - b) Pilot operated
  - c) Solenoid operated
  - d) All the above



<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Hydraulics & Pneumatics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory  
2) Figures to the right indicates full marks.  
3) Assume suitable data if necessary.  
4) Use of nonprogrammable calculator is allowed.

**Section – I**

- Q.2 Solve any Four of the Followings. 16**
- a) Explain cylinder cushioning effect in hydraulic system.
  - b) Explain construction and working of vane type pump.
  - c) Explain with neat sketch hydraulic intensifier.
  - d) Explain with neat sketch working of 3/2 spool type direction control valve.
  - e) Explain hydraulic circuit for sequencing of two cylinder.
- Q.3 Solve any two of the followings. 12**
- a) Define actuator. Explain with neat sketch and symbol tandem cylinder.
  - b) Explain construction and working of pressure compensated flow control valve.
  - c) Explain in detail the regenerative circuit in hydraulic application.

**Section – II**

- Q.4 Solve any Four of the Followings. (4\*4 Marks= 16 Marks) 16**
- a) Explain with a sketch construction & working of the gear type motor.
  - b) Classify the air compressor. Explain selection criteria of compressor.
  - c) Write short note on quick exhaust valve.
  - d) Explain in detail 5/2 direction control valve in pneumatics with symbol.
  - e) Explain with neat sketch time delay circuit.
- Q.5 Solve any two of the followings. 12**
- a) What is FRL unit? Explain with a neat sketch construction & working of air lubricator.
  - b) Sketch and explain pilot operated pressure relief valve with symbol.
  - c) Explain with neat sketch pneumatic meter out circuit of speed control.

Seat No.	
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Set	P
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**T.Y (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Non-Conventional Machining**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Objective types of questions**

**14**

- 1) Non-Traditional machining is recommended when we need the following features?
  - a) Complex shapes
  - b) High surface quality
  - c) Low-rigidity structures
  - d) All of the mentioned
- 2) In mechanical machining, the material is removed by \_\_\_\_\_.
  - a) Erosion
  - b) Corrosion
  - c) Abrasion
  - d) Vaporization
- 3) Which of the following process has the lowest rate of metal removal?
  - a) Electro discharge machining
  - b) Electro-chemical machining
  - c) Abrasive jet machining
  - d) Electron beam machining
- 4) Abrasive carrying liquid for the abrasive slurry in USM is
  - a) Water
  - b) Heavy paraffin oil
  - c) Silicone oil
  - d) Any oil
- 5) In Ultrasonic machining, the material is removed by
  - a) anodic dissolution
  - b) thermal melting
  - c) abrasive action
  - d) electrochemical oxidation
- 6) In EDM the metal removal is carried out by
  - a) fracture of work material due to impact of grains
  - b) electrolysis
  - c) melting and vaporization
  - d) none of the above
- 7) In electrochemical machining, the metal is removed by
  - a) Dissolution in the electrolyte solution
  - b) Molecular transfer
  - c) Ionic bombardment
  - d) Ultraviolet rays
- 8) Chemical machining provides
  - a) Good surface finish
  - b) High material removal rate
  - c) Uniform material removal
  - d) None of them



- 9) The main requirement of the property of the tool material in ECM is
- a) High Thermal conductivity
  - b) Low thermal conductivity
  - c) Moderate electrical conductivity
  - d) Low electrical conductivity
- 10) Electrolyte's electrical conductivity value increases due to
- a) Temperature
  - b) Pressure
  - c) Distribution of hydrogen gas bubbles
  - d) All of the above
- 11) During electrochemical grinding, the material is removed by
- a) Mechanical abrasive action
  - b) Electrochemical dissolution
  - c) Both of them
  - d) None of them
- 12) The surface finish produced by Electro-chemical machining shows
- a) Low corrosion resistance
  - b) Low wear resistance
  - c) Low friction resistance
  - d) Low fatigue strength
- 13) Which of the following is not a type of protective coating?
- a) Metallic
  - b) Non-metallic
  - c) Organic
  - d) Inorganic
- 14) Electrochemically machined surfaces have
- a) High residual stresses and improved fatigue strength
  - b) High residual stresses and reduced fatigue strength
  - c) Insignificant residual stresses and reduced fatigue strength
  - d) Insignificant residual stresses and improved fatigue strength

Seat No.	
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Set	P
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**T.Y (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Non-Conventional Machining**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Neat sketches must be drawn wherever necessary.  
 3) Assume additional suitable data wherever necessary and mention it clearly.  
 4) Figure to the right indicates full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Give classification of Non-Conventional Machining Processes                       | <b>04</b> |
|            | <b>b)</b> Compare Conventional machining processes and Non-Conventional Machining Processes | <b>05</b> |
|            | <b>c)</b> Explain Abrasive Water Jet Machining.   | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain the need for Non-Conventional Machining Processes.                        | <b>05</b> |
|            | <b>b)</b> Explain Abrasive Jet Machining.   | <b>05</b> |
|            | <b>c)</b> Give applications of EDM  | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain Electric Discharge Machining (EDM).                                       | <b>05</b> |
|            | <b>b)</b> What is flushing? Explain different types with their advantages.                  | <b>04</b> |
|            | <b>c)</b> Compare Abrasive Water Jet Machining & Water Jet Machining                        | <b>05</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain Chemical Machining.   | <b>05</b> |
|            | <b>b)</b> Explain Photochemical Machining.                                      | <b>05</b> |
|            | <b>c)</b> Explain Laser Beam machining (LBM).                                   | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Explain Electro-Chemical Machining Processes.                         | <b>05</b> |
|            | <b>b)</b> Explain Plasma Arc machining (PAM).                                   | <b>05</b> |
|            | <b>c)</b> Explain the Chemical and Physical vapor deposition process.           | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> Explain Ion Beam machining (IBM).                                     | <b>04</b> |
|            | <b>b)</b> Give the applications of the coating process                          | <b>05</b> |
|            | <b>c)</b> Explain the Metallic coating process with advantages and limitations. | <b>05</b> |

Seat No.	
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Set Q
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**T.Y (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Non-Conventional Machining**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Objective types of questions**

**14**

- 1) Chemical machining provides
  - a) Good surface finish
  - b) High material removal rate
  - c) Uniform material removal
  - d) None of them
- 2) The main requirement of the property of the tool material in ECM is
  - a) High Thermal conductivity
  - b) Low thermal conductivity
  - c) Moderate electrical conductivity
  - d) Low electrical conductivity
- 3) Electrolyte's electrical conductivity value increases due to
  - a) Temperature
  - b) Pressure
  - c) Distribution of hydrogen gas bubbles
  - d) All of the above
- 4) During electrochemical grinding, the material is removed by
  - a) Mechanical abrasive action
  - b) Electrochemical dissolution
  - c) Both of them
  - d) None of them
- 5) The surface finish produced by Electro-chemical machining shows
  - a) Low corrosion resistance
  - b) Low wear resistance
  - c) Low friction resistance
  - d) Low fatigue strength
- 6) Which of the following is not a type of protective coating?
  - a) Metallic
  - b) Non-metallic
  - c) Organic
  - d) Inorganic
- 7) Electrochemically machined surfaces have
  - a) High residual stresses and improved fatigue strength
  - b) High residual stresses and reduced fatigue strength
  - c) Insignificant residual stresses and reduced fatigue strength
  - d) Insignificant residual stresses and improved fatigue strength

- 8) Non-Traditional machining is recommended when we need the following features?
- a) Complex shapes
  - b) High surface quality
  - c) Low-rigidity structures
  - d) All of the mentioned
- 9) In mechanical machining, the material is removed by \_\_\_\_\_
- a) Erosion
  - b) Corrosion
  - c) Abrasion
  - d) Vaporization
- 10) Which of the following process has the lowest rate of metal removal?
- a) Electro discharge machining
  - b) Electro-chemical machining
  - c) Abrasive jet machining
  - d) Electron beam machining
- 11) Abrasive carrying liquid for the abrasive slurry in USM is
- a) Water
  - b) Heavy paraffin oil
  - c) Silicone oil
  - d) Any oil
- 12) In Ultrasonic machining, the material is removed by
- a) anodic dissolution
  - b) thermal melting
  - c) abrasive action
  - d) electrochemical oxidation
- 13) In EDM the metal removal is carried out by
- a) fracture of work material due to impact of grains
  - b) electrolysis
  - c) melting and vaporization
  - d) none of the above
- 14) In electrochemical machining, the metal is removed by
- a) Dissolution in the electrolyte solution
  - b) Molecular transfer
  - c) Ionic bombardment
  - d) Ultraviolet rays

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Non-Conventional Machining**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
2) Neat sketches must be drawn wherever necessary.  
3) Assume additional suitable data wherever necessary and mention it clearly.  
4) Figure to the right indicates full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Give classification of Non-Conventional Machining Processes                       | <b>04</b> |
|            | <b>b)</b> Compare Conventional machining processes and Non-Conventional Machining Processes | <b>05</b> |
|            | <b>c)</b> Explain Abrasive Water Jet Machining.   | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain the need for Non-Conventional Machining Processes.                        | <b>05</b> |
|            | <b>b)</b> Explain Abrasive Jet Machining.   | <b>05</b> |
|            | <b>c)</b> Give applications of EDM  | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain Electric Discharge Machining (EDM).                                       | <b>05</b> |
|            | <b>b)</b> What is flushing? Explain different types with their advantages.                  | <b>04</b> |
|            | <b>c)</b> Compare Abrasive Water Jet Machining & Water Jet Machining                        | <b>05</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain Chemical Machining.   | <b>05</b> |
|            | <b>b)</b> Explain Photochemical Machining.                                      | <b>05</b> |
|            | <b>c)</b> Explain Laser Beam machining (LBM).                                   | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Explain Electro-Chemical Machining Processes.                         | <b>05</b> |
|            | <b>b)</b> Explain Plasma Arc machining (PAM).                                   | <b>05</b> |
|            | <b>c)</b> Explain the Chemical and Physical vapor deposition process.           | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> Explain Ion Beam machining (IBM).                                     | <b>04</b> |
|            | <b>b)</b> Give the applications of the coating process                          | <b>05</b> |
|            | <b>c)</b> Explain the Metallic coating process with advantages and limitations. | <b>05</b> |

Seat No.	
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Set	R
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**T.Y (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Non-Conventional Machining**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Objective types of questions**

**14**

- 1) During electrochemical grinding, the material is removed by
  - a) Mechanical abrasive action
  - b) Electrochemical dissolution
  - c) Both of them
  - d) None of them
- 2) The surface finish produced by Electro-chemical machining shows
 

a) Low corrosion resistance	b) Low wear resistance
c) Low friction resistance	d) Low fatigue strength
- 3) Which of the following is not a type of protective coating?
 

a) Metallic	b) Non-metallic
c) Organic	d) Inorganic
- 4) Electrochemically machined surfaces have
  - a) High residual stresses and improved fatigue strength
  - b) High residual stresses and reduced fatigue strength
  - c) Insignificant residual stresses and reduced fatigue strength
  - d) Insignificant residual stresses and improved fatigue strength
- 5) Non-Traditional machining is recommended when we need the following features?
 

a) Complex shapes	b) High surface quality
c) Low-rigidity structures	d) All of the mentioned
- 6) In mechanical machining, the material is removed by \_\_\_\_\_.
 

a) Erosion	b) Corrosion
c) Abrasion	d) Vaporization
- 7) Which of the following process has the lowest rate of metal removal?
 

a) Electro discharge machining	b) Electro-chemical machining
c) Abrasive jet machining	d) Electron beam machining
- 8) Abrasive carrying liquid for the abrasive slurry in USM is
 

a) Water	b) Heavy paraffin oil
c) Silicone oil	d) Any oil

- 9) In Ultrasonic machining, the material is removed by  
a) anodic dissolution                      b) thermal melting  
c) abrasive action                         d) electrochemical oxidation
- 10) In EDM the metal removal is carried out by  
a) fracture of work material due to impact of grains  
b) electrolysis  
c) melting and vaporization  
d) none of the above
- 11) In electrochemical machining, the metal is removed by  
a) Dissolution in the electrolyte solution  
b) Molecular transfer  
c) Ionic bombardment  
d) Ultraviolet rays
- 12) Chemical machining provides  
a) Good surface finish                      b) High material removal rate  
c) Uniform material removal              d) None of them
- 13) The main requirement of the property of the tool material in ECM is  
a) High Thermal conductivity  
b) Low thermal conductivity  
c) Moderate electrical conductivity  
d) Low electrical conductivity
- 14) Electrolyte's electrical conductivity value increases due to  
a) Temperature  
b) Pressure  
c) Distribution of hydrogen gas bubbles  
d) All of the above

<b>Seat No.</b>	
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**Set R**

**T.Y (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Non-Conventional Machining**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Neat sketches must be drawn wherever necessary.  
 3) Assume additional suitable data wherever necessary and mention it clearly.  
 4) Figure to the right indicates full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Give classification of Non-Conventional Machining Processes                       | <b>04</b> |
|            | <b>b)</b> Compare Conventional machining processes and Non-Conventional Machining Processes | <b>05</b> |
|            | <b>c)</b> Explain Abrasive Water Jet Machining.   | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain the need for Non-Conventional Machining Processes.                        | <b>05</b> |
|            | <b>b)</b> Explain Abrasive Jet Machining.   | <b>05</b> |
|            | <b>c)</b> Give applications of EDM  | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain Electric Discharge Machining (EDM).                                       | <b>05</b> |
|            | <b>b)</b> What is flushing? Explain different types with their advantages.                  | <b>04</b> |
|            | <b>c)</b> Compare Abrasive Water Jet Machining & Water Jet Machining                        | <b>05</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain Chemical Machining.   | <b>05</b> |
|            | <b>b)</b> Explain Photochemical Machining.                                      | <b>05</b> |
|            | <b>c)</b> Explain Laser Beam machining (LBM).                                   | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Explain Electro-Chemical Machining Processes.                         | <b>05</b> |
|            | <b>b)</b> Explain Plasma Arc machining (PAM).                                   | <b>05</b> |
|            | <b>c)</b> Explain the Chemical and Physical vapor deposition process.           | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> Explain Ion Beam machining (IBM).                                     | <b>04</b> |
|            | <b>b)</b> Give the applications of the coating process                          | <b>05</b> |
|            | <b>c)</b> Explain the Metallic coating process with advantages and limitations. | <b>05</b> |



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Set	S
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**T.Y (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Non-Conventional Machining**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Objective types of questions**

**14**

- 1) In EDM the metal removal is carried out by
  - a) fracture of work material due to impact of grains
  - b) electrolysis
  - c) melting and vaporization
  - d) none of the above
- 2) In electrochemical machining, the metal is removed by
  - a) Dissolution in the electrolyte solution
  - b) Molecular transfer
  - c) Ionic bombardment
  - d) Ultraviolet rays
- 3) Chemical machining provides
 

a) Good surface finish	b) High material removal rate
c) Uniform material removal	d) None of them
- 4) The main requirement of the property of the tool material in ECM is
  - a) High Thermal conductivity
  - b) Low thermal conductivity
  - c) Moderate electrical conductivity
  - d) Low electrical conductivity
- 5) Electrolyte's electrical conductivity value increases due to
  - a) Temperature
  - b) Pressure
  - c) Distribution of hydrogen gas bubbles
  - d) All of the above
- 6) During electrochemical grinding, the material is removed by
  - a) Mechanical abrasive action
  - b) Electrochemical dissolution
  - c) Both of them
  - d) None of them
- 7) The surface finish produced by Electro-chemical machining shows
 

a) Low corrosion resistance	b) Low wear resistance
c) Low friction resistance	d) Low fatigue strength

- 8) Which of the following is not a type of protective coating?
- a) Metallic
  - b) Non-metallic
  - c) Organic
  - d) Inorganic
- 9) Electrochemically machined surfaces have
- a) High residual stresses and improved fatigue strength
  - b) High residual stresses and reduced fatigue strength
  - c) Insignificant residual stresses and reduced fatigue strength
  - d) Insignificant residual stresses and improved fatigue strength
- 10) Non-Traditional machining is recommended when we need the following features?
- a) Complex shapes
  - b) High surface quality
  - c) Low-rigidity structures
  - d) All of the mentioned
- 11) In mechanical machining, the material is removed by \_\_\_\_\_
- a) Erosion
  - b) Corrosion
  - c) Abrasion
  - d) Vaporization
- 12) Which of the following process has the lowest rate of metal removal?
- a) Electro discharge machining
  - b) Electro-chemical machining
  - c) Abrasive jet machining
  - d) Electron beam machining
- 13) Abrasive carrying liquid for the abrasive slurry in USM is
- a) Water
  - b) Heavy paraffin oil
  - c) Silicone oil
  - d) Any oil
- 14) In Ultrasonic machining, the material is removed by
- a) anodic dissolution
  - b) thermal melting
  - c) abrasive action
  - d) electrochemical oxidation

Seat No.	
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Set **S**

**T.Y (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Non-Conventional Machining**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Neat sketches must be drawn wherever necessary.  
 3) Assume additional suitable data wherever necessary and mention it clearly.  
 4) Figure to the right indicates full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Give classification of Non-Conventional Machining Processes                       | <b>04</b> |
|            | <b>b)</b> Compare Conventional machining processes and Non-Conventional Machining Processes | <b>05</b> |
|            | <b>c)</b> Explain Abrasive Water Jet Machining.   | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain the need for Non-Conventional Machining Processes.                        | <b>05</b> |
|            | <b>b)</b> Explain Abrasive Jet Machining.   | <b>05</b> |
|            | <b>c)</b> Give applications of EDM  | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain Electric Discharge Machining (EDM).                                       | <b>05</b> |
|            | <b>b)</b> What is flushing? Explain different types with their advantages.                  | <b>04</b> |
|            | <b>c)</b> Compare Abrasive Water Jet Machining & Water Jet Machining                        | <b>05</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain Chemical Machining.   | <b>05</b> |
|            | <b>b)</b> Explain Photochemical Machining.                                      | <b>05</b> |
|            | <b>c)</b> Explain Laser Beam machining (LBM).                                   | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Explain Electro-Chemical Machining Processes.                         | <b>05</b> |
|            | <b>b)</b> Explain Plasma Arc machining (PAM).                                   | <b>05</b> |
|            | <b>c)</b> Explain the Chemical and Physical vapor deposition process.           | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> Explain Ion Beam machining (IBM).                                     | <b>04</b> |
|            | <b>b)</b> Give the applications of the coating process                          | <b>05</b> |
|            | <b>c)</b> Explain the Metallic coating process with advantages and limitations. | <b>05</b> |

**Seat  
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## Max. Marks: 70

Marks: 14

a) EOQ  
b) Break even point  
c) EOP  
d) None of Above

- 7) For locating and clamping round job \_\_\_\_\_.
  - a) Box jig
  - b) Only jig
  - c) Only fixture
  - d) Indexing jig
- 8) In metal cutting while drawing merchant circle number of assumption follows \_\_\_\_\_.
  - a) The cutting velocity remains constant
  - b) Continuous chip without built up edge
  - c) No constant cutting velocity
  - d) Continuous chip with built up edge
- 9) In Jig or fixture diamond pin locator is used when \_\_\_\_\_.
  - a) There is two already machined parallel holes in work piece
  - b) Two or more than two parallel holes in work piece
  - c) One hole is already machined in work piece
  - d) No hole is exist in the work piece
- 10) In press tool the main purpose of spring loaded stripper \_\_\_\_\_.
  - a) To hold the strip
  - b) To guide the punch
  - c) Strip out the material
  - d) Two cut the material

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

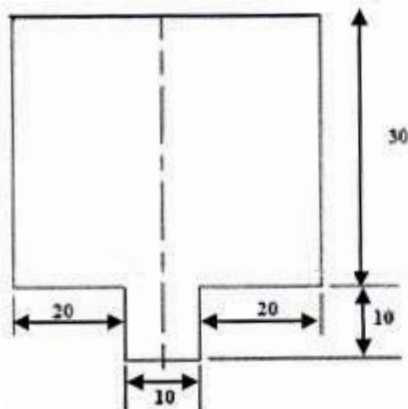
Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 2 and Q. No. 6 are compulsory.  
 2) Solve any two questions from section - I (from Q. 3, 4 and 5) and section - II (from Q. 7, 8 and 9).

**Section - I**

- Q.2 a)** Design a press tool for the component shown in fig-I giving following details. **14**
- 1) Cutting force
  - 2) Clearance between punch and die
  - 3) Stripping force and no of bolts and bolt size need for die clamping

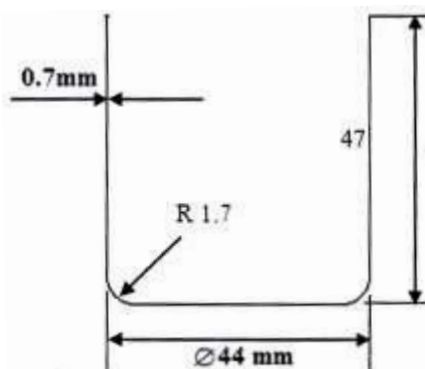


Material: - C40  
 Thickness = 4mm  
 Shear strength = 42 kg/mm<sup>2</sup>

Also draw one sectional view of assembly of press tool and part name.

**OR**

- Q.2 b)** Design a draw tool for given component Fig-II also calculate the following (draw one sectional view of assembly).
- 1) Blank size
  - 2) No of draws
  - 3) Draw ratio
  - 4) Drawing force
  - 5) Blank force
  - 6) Die and punch clearance

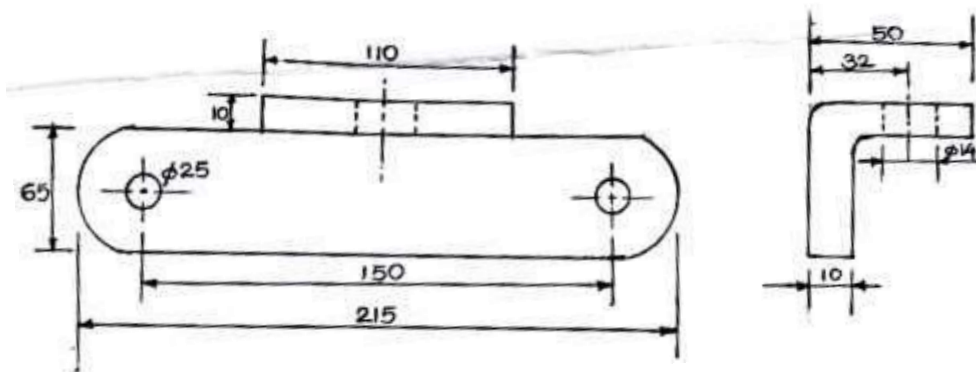


Material: - CRCA  
 Material Thickness: - 0.7  
 Yield strength = 42 kg/mm<sup>2</sup>

- Q.3 a)** The following observations were made during on orthogonal cutting operation. **04**
- 1) rake angle -  $20^\circ$
  - 2) shear angle -  $29.54^\circ$
  - 3) cutting force - 300N
  - 4) feed force - 120N
  - 5) cutting velocity = 102 m/min
- Determine
- 1) shear strain
  - 2) work done in shear
- b)** Sketch and explain in brief about velocity relation in orthogonal cutting. **03**
- Q.4 a)** Explain in brief about tool dynamometer. **03**
- b)** List types of tool materials and explain in brief any two materials. **04**
- Q.5 Writes a short note on (any two)** **07**
- a) Types of stripper in press tool
  - b) Types of chips
  - c) Type of coolant

### Section – II

- Q.6 a)** Design drill jig for drilling die 25mm hole draw one view of sectional assembly with parts name. **14**



**OR**

- b)** Design milling fixture for milling 110 x 10 face draw one view of sectional assembly with parts name. **14**
- Q.7 a)** Explain in brief about breakeven point. **04**
- b)** Explain in brief about geometry of twist drill. **03**
- Q.8 a)** With neat sketch explain in brief about any two indexing devices used in jig or fixture. **04**
- b)** List type of bush (drill bush) used in jig and explain in brief used of each drill brush. **03**
- Q.9 Writes short notes on (any two)** **07**
- a) 3-2-1 principle for jig & fixture
  - b) Effect of tool geometry on tool life
  - c) Locating and clamping devices used in fixture

Seat No.	
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Set Q
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book).  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

- Q.1 A) Choose the correct alternatives from the options. (Each question carries one mark) 06**
- 1) Fixture is normally used for \_\_\_\_\_.  
 a) Drilling and reaming                      b) Turning  
 c) Milling    d) None of Above
  - 2) No profit no loss occur at point \_\_\_\_\_.  
 a) EOQ    b) Break even point  
 c) EOP    d) None of Above
  - 3) In an ASA system if tool signature is  $8^\circ-14^\circ-5^\circ-6^\circ-10^\circ-16^\circ-3^\circ$  mm the Back Rack angle is \_\_\_\_\_.  
 a)  $16^\circ$     b)  $3^\circ$   
 c)  $5^\circ$     d)  $8^\circ$
  - 4) In metal cutting if the shear angle is Shorter the plane of shear will be larger hence the required force will be \_\_\_\_\_.  
 a) Less    b) More  
 c) Fixed    d) Not predict
  - 5) In press tool combination die is used for \_\_\_\_\_.  
 a) Two cutting operation  
 b) Two bending operation  
 c) One cutting and one forming operation  
 d) Both forming operation
  - 6) In deep draw, drawing force is equal to \_\_\_\_\_.  
 a)  $dt \cdot 6_y (D/d-C)$                       b)  $d \cdot 6_y (D/d-C)$   
 c)  $dt (D/d-C)$                       d) None of these  
 where  $d$  = shell dia,  $t$  = thickness,  $D$  = blank dia,  $6_y$  = yield strength,  
 $c$  = constant



- a) There is two already machined parallel holes in work piece
- b) Two or more than two parallel holes in work piece
- c) One hole is already machined in work piece
- d) No hole is exist in the work piece

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

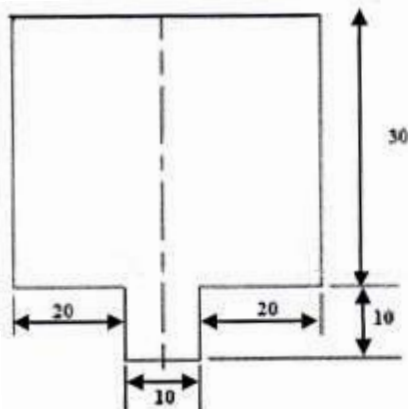
Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 2 and Q. No. 6 are compulsory.  
 2) Solve any two questions from section - I (from Q. 3, 4 and 5) and section - II (from Q. 7, 8 and 9).

**Section - I**

- Q.2 a)** Design a press tool for the component shown in fig-I giving following details. **14**
- 1) Cutting force
  - 2) Clearance between punch and die
  - 3) Stripping force and no of bolts and bolt size need for die clamping

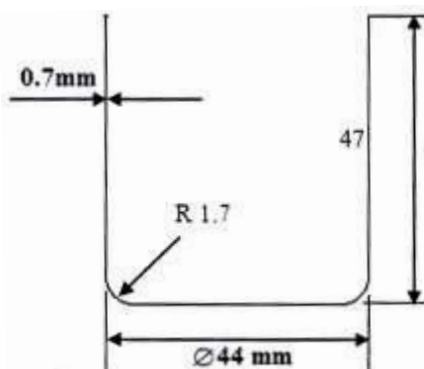


Material: - C40  
 Thickness = 4mm  
 Shear strength = 42 kg/mm<sup>2</sup>

Also draw one sectional view of assembly of press tool and part name.

**OR**

- Q.2 b)** Design a draw tool for given component Fig-II also calculate the following (draw one sectional view of assembly).
- 1) Blank size
  - 2) No of draws
  - 3) Draw ratio
  - 4) Drawing force
  - 5) Blank force
  - 6) Die and punch clearance

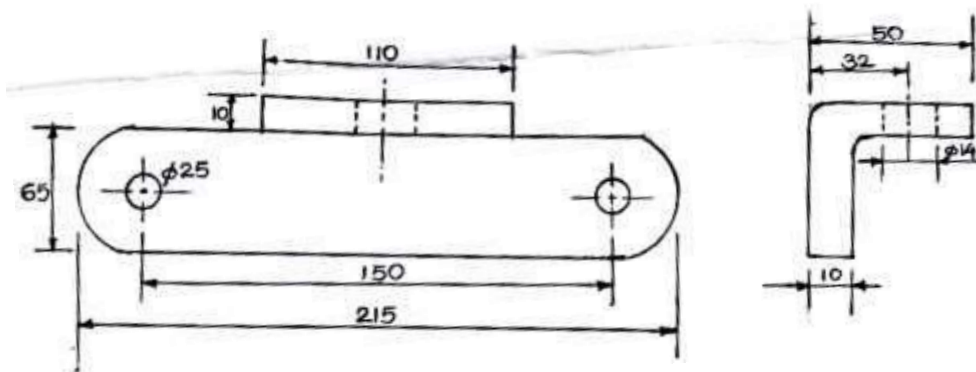


Material: - CRCA  
 Material Thickness: - 0.7  
 Yield strength = 42 kg/mm<sup>2</sup>

- Q.3 a)** The following observations were made during on orthogonal cutting operation. **04**
- 1) rake angle -  $20^\circ$
  - 2) shear angle -  $29.54^\circ$
  - 3) cutting force - 300N
  - 4) feed force - 120N
  - 5) cutting velocity = 102 m/min
- Determine
- 1) shear strain
  - 2) work done in shear
- b)** Sketch and explain in brief about velocity relation in orthogonal cutting. **03**
- Q.4 a)** Explain in brief about tool dynamometer. **03**
- b)** List types of tool materials and explain in brief any two materials. **04**
- Q.5 Writes a short note on (any two)** **07**
- a) Types of stripper in press tool
  - b) Types of chips
  - c) Type of coolant

### Section – II

- Q.6 a)** Design drill jig for drilling die 25mm hole draw one view of sectional assembly with parts name. **14**



**OR**

- b)** Design milling fixture for milling 110 x 10 face draw one view of sectional assembly with parts name. **14**
- Q.7 a)** Explain in brief about breakeven point. **04**
- b)** Explain in brief about geometry of twist drill. **03**
- Q.8 a)** With neat sketch explain in brief about any two indexing devices used in jig or fixture. **04**
- b)** List type of bush (drill bush) used in jig and explain in brief used of each drill brush. **03**
- Q.9 Writes short notes on (any two)** **07**
- a) 3-2-1 principle for jig & fixture
  - b) Effect of tool geometry on tool life
  - c) Locating and clamping devices used in fixture

Seat No.	
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Set	R
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book).  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 A) Choose the correct alternatives from the options. (Each question carries one mark) 06**

- 1) In press tool combination die is used for \_\_\_\_\_.  
 a) Two cutting operation  
 b) Two bending operation  
 c) One cutting and one forming operation  
 d) Both forming operation
- 2) In deep draw, drawing force is equal to \_\_\_\_\_.  
 a)  $dt \cdot 6_y (D/d-C)$   
 b)  $d \cdot 6_y (D/d-C)$   
 c)  $dt (D/d-C)$   
 d) None of these  
 where  $d$  = shell dia,  $t$  = thickness,  $D$  = blank dia,  $6_y$  = yield strength,  $c$  = constant
- 3) Fixture is normally used for \_\_\_\_\_.  
 a) Drilling and reaming  
 b) Turning  
 c) Milling  
 d) None of Above
- 4) No profit no loss occur at point \_\_\_\_\_.  
 a) EOQ  
 b) Break even point  
 c) EOP  
 d) None of Above
- 5) In an ASA system if tool signature is  $8^\circ-14^\circ-5^\circ-6^\circ-10^\circ-16^\circ-3^\circ$  mm the Back Rack angle is \_\_\_\_\_.  
 a)  $16^\circ$   
 b)  $3^\circ$   
 c)  $5^\circ$   
 d)  $8^\circ$
- 6) In metal cutting if the shear angle is Shorter the plane of shear will be larger hence the required force will be \_\_\_\_\_.  
 a) Less  
 b) More  
 c) Fixed  
 d) Not predict

- B) Attempt the following multiple choice correct answer type questions. (Each question carry two marks)**
- 7)** In Jig or fixture diamond pin locator is used when \_\_\_\_\_.  
a) There is two already machined parallel holes in work piece  
b) Two or more than two parallel holes in work piece  
c) One hole is already machined in work piece  
d) No hole is exist in the work piece
- 8)** In press tool the main purpose of spring loaded stripper \_\_\_\_\_.  
a) To hold the strip  
b) To guide the punch  
c) Strip out the material  
d) Two cut the material
- 9)** For locating and clamping round job \_\_\_\_\_.  
a) Box jig  
b) Only jig  
c) Only fixture  
d) Indexing jig
- 10)** In metal cutting while drawing merchant circle number of assumptions as follows \_\_\_\_\_.  
a) The cutting velocity remains constant  
b) Continuous chip without built up edge  
c) No constant cutting velocity  
d) Continuous chip with built up edge

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

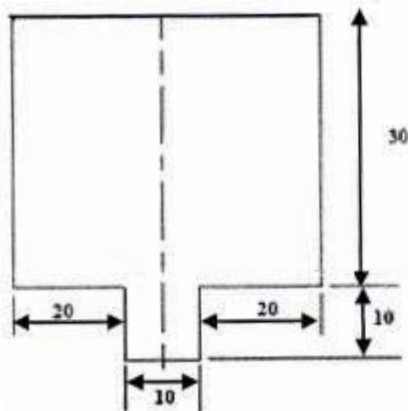
Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 2 and Q. No. 6 are compulsory.  
 2) Solve any two questions from section - I (from Q. 3, 4 and 5) and section - II (from Q. 7, 8 and 9).

**Section - I**

- Q.2 a)** Design a press tool for the component shown in fig-I giving following details. **14**
- 1) Cutting force
  - 2) Clearance between punch and die
  - 3) Stripping force and no of bolts and bolt size need for die clamping

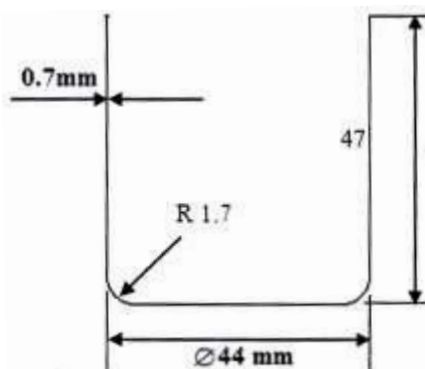


Material: - C40  
 Thickness = 4mm  
 Shear strength = 42 kg/mm<sup>2</sup>

Also draw one sectional view of assembly of press tool and part name.

**OR**

- Q.2 b)** Design a draw tool for given component Fig-II also calculate the following (draw one sectional view of assembly).
- 1) Blank size
  - 2) No of draws
  - 3) Draw ratio
  - 4) Drawing force
  - 5) Blank force
  - 6) Die and punch clearance

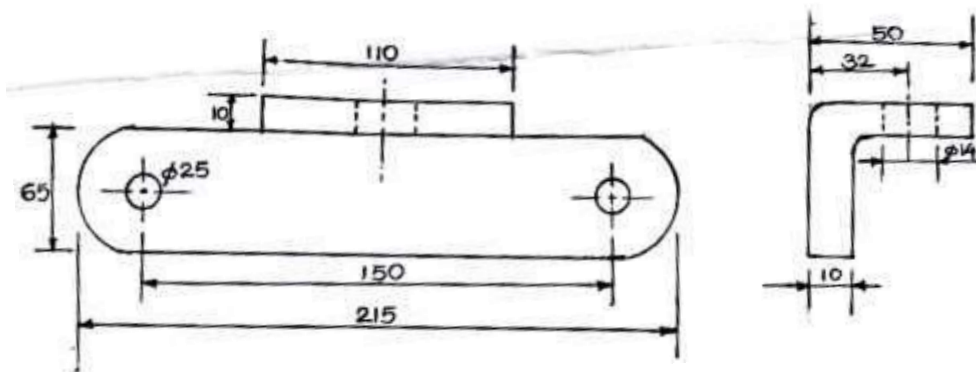


Material: - CRCA  
 Material Thickness: - 0.7  
 Yield strength = 42 kg/mm<sup>2</sup>

- Q.3 a)** The following observations were made during on orthogonal cutting operation. **04**
- 1) rake angle -  $20^\circ$
  - 2) shear angle -  $29.54^\circ$
  - 3) cutting force - 300N
  - 4) feed force - 120N
  - 5) cutting velocity = 102 m/min
- Determine
- 1) shear strain
  - 2) work done in shear
- b)** Sketch and explain in brief about velocity relation in orthogonal cutting. **03**
- Q.4 a)** Explain in brief about tool dynamometer. **03**
- b)** List types of tool materials and explain in brief any two materials. **04**
- Q.5 Writes a short note on (any two)** **07**
- a) Types of stripper in press tool
  - b) Types of chips
  - c) Type of coolant

### Section – II

- Q.6 a)** Design drill jig for drilling die 25mm hole draw one view of sectional assembly with parts name. **14**



**OR**

- b)** Design milling fixture for milling 110 x 10 face draw one view of sectional assembly with parts name. **14**
- Q.7 a)** Explain in brief about breakeven point. **04**
- b)** Explain in brief about geometry of twist drill. **03**
- Q.8 a)** With neat sketch explain in brief about any two indexing devices used in jig or fixture. **04**
- b)** List type of bush (drill bush) used in jig and explain in brief used of each drill brush. **03**
- Q.9 Writes short notes on (any two)** **07**
- a) 3-2-1 principle for jig & fixture
  - b) Effect of tool geometry on tool life
  - c) Locating and clamping devices used in fixture

**Seat  
No.**

Max. Marks: 70

Marks: 14

Page 13 of 16



- B) Attempt the following multiple choice correct answer type questions. (Each question carry two marks)**
- 7) In metal cutting while drawing merchant circle number of assumptions as follows \_\_\_\_\_.  
a) The cutting velocity remains constant  
b) Continuous chip without built up edge  
c) No constant cutting velocity  
d) Continuous chip with built up edge
- 8) In Jig or fixture diamond pin locator is used when \_\_\_\_\_.  
a) There is two already machined parallel holes in work piece  
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- 9) In press tool the main purpose of spring loaded stripper \_\_\_\_\_.  
a) To hold the strip  
b) To guide the punch  
c) Strip out the material  
d) Two cut the material
- 10) For locating and clamping round job \_\_\_\_\_.  
a) Box jig  
b) Only jig  
c) Only fixture  
d) Indexing jig

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Tool Engineering**

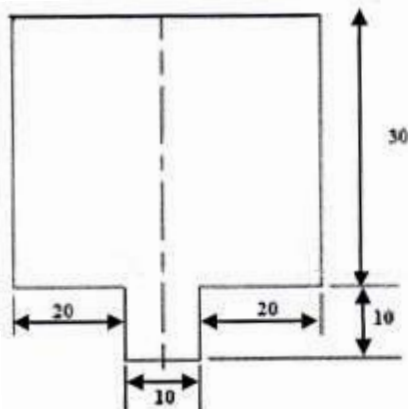
Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 2 and Q. No. 6 are compulsory.  
 2) Solve any two questions from section - I (from Q. 3, 4 and 5) and section - II (from Q. 7, 8 and 9).

**Section - I**

- Q.2 a)** Design a press tool for the component shown in fig-I giving following details. **14**
- 1) Cutting force
  - 2) Clearance between punch and die
  - 3) Stripping force and no of bolts and bolt size need for die clamping

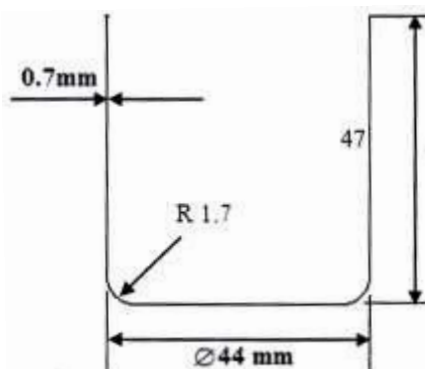


Material: - C40  
 Thickness = 4mm  
 Shear strength = 42 kg/mm<sup>2</sup>

Also draw one sectional view of assembly of press tool and part name.

**OR**

- Q.2 b)** Design a draw tool for given component Fig-II also calculate the following (draw one sectional view of assembly).
- 1) Blank size
  - 2) No of draws
  - 3) Draw ratio
  - 4) Drawing force
  - 5) Blank force
  - 6) Die and punch clearance

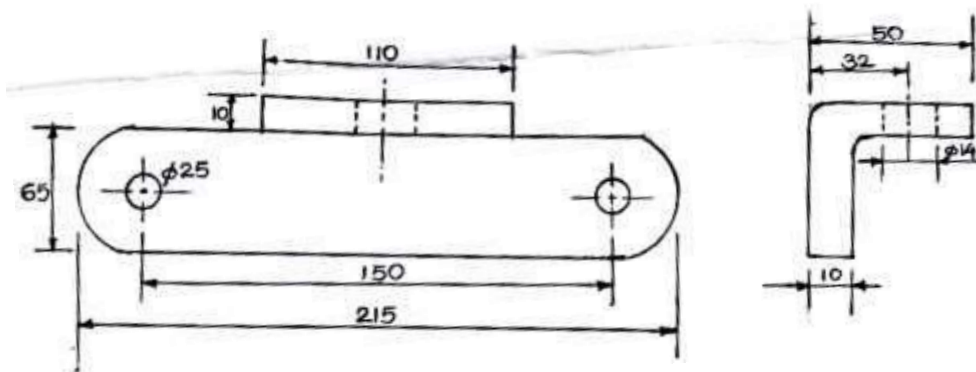


Material: - CRCA  
 Material Thickness: - 0.7  
 Yield strength = 42 kg/mm<sup>2</sup>

- Q.3 a)** The following observations were made during on orthogonal cutting operation. **04**
- 1) rake angle -  $20^\circ$
  - 2) shear angle -  $29.54^\circ$
  - 3) cutting force - 300N
  - 4) feed force - 120N
  - 5) cutting velocity = 102 m/min
- Determine
- 1) shear strain
  - 2) work done in shear
- b)** Sketch and explain in brief about velocity relation in orthogonal cutting. **03**
- Q.4 a)** Explain in brief about tool dynamometer. **03**
- b)** List types of tool materials and explain in brief any two materials. **04**
- Q.5 Writes a short note on (any two)** **07**
- a) Types of stripper in press tool
  - b) Types of chips
  - c) Type of coolant

### Section – II

- Q.6 a)** Design drill jig for drilling die 25mm hole draw one view of sectional assembly with parts name. **14**



**OR**

- b)** Design milling fixture for milling 110 x 10 face draw one view of sectional assembly with parts name. **14**
- Q.7 a)** Explain in brief about breakeven point. **04**
- b)** Explain in brief about geometry of twist drill. **03**
- Q.8 a)** With neat sketch explain in brief about any two indexing devices used in jig or fixture. **04**
- b)** List type of bush (drill bush) used in jig and explain in brief used of each drill brush. **03**
- Q.9 Writes short notes on (any two)** **07**
- a) 3-2-1 principle for jig & fixture
  - b) Effect of tool geometry on tool life
  - c) Locating and clamping devices used in fixture

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above



<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.  
a) which can be only changed in the long run  
b) which can be changed in the short run  
c) which can be never be changed  
d) All of the above
- 10) Which one of the following is not the function of money?  
a) Medium of exchange  
b) Measure of Happiness  
c) Standard of deferred payment  
d) Store of value

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Who is known as father of economics?
 

a) Adam Smith	b) Prof. A. Samuelson
c) Alfred Marshall	d) J. R. Hicks
- 2) Which of these is an economic activity?
 

a) Father teaching his son at home instead of spending on coaching
b) A housewife making food for the family on her own
c) A hair dresser doing hair cut designing on payment
d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
 

a) Socialism
b) Capitalism
c) A place where goods are traded
d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
 

a) False	b) True
c) Partly true	d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
 

a) which can be only changed in the long run
b) which can be changed in the short run
c) which can be never be changed
d) All of the above
- 6) Which one of the following is not the function of money?
 

a) Medium of exchange
b) Measure of Happiness
c) Standard of deferred payment
d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-113**

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4** Discuss the features of new economic policy in India. **10**
- Q.5** Explain the properties of perfect and imperfectly competitive market. **10**
- Q.6** Define national income. Explain the methods of measuring national income. **10**
- Q.7** Define central bank, discuss the function of central banking in India. **10**

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850



- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Two)** **20**
- a) Explain the detail the role of WTO in protecting intellectual property rights.
  - b) How the intellectual property is useful for Engineers. Explain in detail with example.
  - c) Compare the Indian IPR system with international IPR framework.
- Q.3 Write short notes (Any Four)** **20**
- a) Concept of valuation of Intellectual property and value realization
  - b) Protection of traditional knowledge
  - c) Bio technology and intellectual property
  - d) TRIPS & Access to Medicines
  - e) Concepts of confidentiality and information security
  - f) Copy right issues in creative works

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicate full marks.

Marks:10

10

- Page 7 of 12

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works



Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
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- 5) What is copyright meant for?
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  - c) Essay
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- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**

**MECHANICAL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
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  - d) Aristotle
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  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set 

R
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022****MECHANICAL ENGINEERING****Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 2) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 3) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 4) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 5) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 6) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 7) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **S****T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022****MECHANICAL ENGINEERING****Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 2) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 3) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 5) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 6) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 8) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 9) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 10) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**MECHANICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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**Set****P****T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022****MECHANICAL ENGINEERING****Stress and Coping**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

**Seat  
No.**

Max. Marks: 50

Marks: 10

10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_.
- a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set	S
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
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- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks

Marks:10

**10**

- Page 1 of 12



- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

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<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4 Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics





- a) Culture
- c) Society

- b) Value
- d) Moral

- a) Moral  
c) Values

- b) Ethics
- d) Positive and preferred values

<b>Seat No.</b>	
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**Set**

<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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Set

P

**T. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Machine Design - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) When the axes of two shafts are parallel, use \_\_\_\_\_.  
 a) crossed helical gears                      b) bevel  
 c) worm gears                                      d) spur or helical gears
- 2) Which of the following type of gears are free from axial thrust?  
 a) Herringbone gears                      b) Bevel gears  
 c) Worm gears                                      d) Helical gears
- 3) The initial contact in helical gears is \_\_\_\_\_.  
 a) point    b) line  
 c) surface    d) unpredictable
- 4) When two bevel gears having equal teeth and equal pitch angle are used to transmit power between shafts that are intersecting at right angle, they are called,  
 a) spiral bevel gears                      b) Miter gears  
 c) straight bevel gears                      d) hypoid gears
- 5) When bevel gears are used to transmit power between shafts that are intersecting at an angle greater than  $90^\circ$ , and if the pitch angle of one of the gears is  $90^\circ$ , they are called,  
 a) spiral bevel gears                      b) crown gears  
 c) straight bevel gears                      d) hypoid gears
- 6) Worm gears are widely used when  
 a) velocity ratio is high  
 b) space is limited  
 c) axes of shafts are non-intersecting  
 d) all the three
- 7) The axial component of resultant force on worm wheel is equal to  
 a) tangential component on worm  
 b) radial component on worm  
 c) axial component on worm  
 d) none of the above

- 8) A cylinder is considered as thin cylinder when the ratio of inner diameter to the wall thickness is,
- a) more than 15
  - b) less than 15
  - c) equal to 15
  - d) none of these criteria
- 9) The thickness of thin cylinder is determined on the basis of,
- a) radial stress
  - b) longitudinal stress
  - c) circumferential stress
  - d) principal shear stress
- 10) The thickness of thick cylinder shell with open ends and made of ductile material is determined by \_\_\_\_\_.  
a) Lamé's equation      b) Clavarino's equation  
c) Birnie's equation      d) Barlow's equation
- 11) Autofrettage is,
- a) a surface coating process of cylinders for corrosion resistance
  - b) a heat treatment process for cylinders to relieve residual stresses
  - c) a process of pre-stressing the cylinder to develop residual compressive stress at the inner surface
  - d) a surface hardening process of cylinder to improve wear resistance
- 12) In radial bearings, the load acts
- a) along the axis of rotation
  - b) perpendicular to the axis of rotation
  - c) parallel to the axis of rotation
  - d) a and c
- 13) Rolling contact bearings as compared to sliding contact bearings have
- a) lower starting torque
  - b) require considerable axial space
  - c) generate less noise
  - d) costly
- 14) In case of full journal bearing, the angle of contact of the bushing with the journal is
- a)  $60^\circ$
  - b)  $90^\circ$
  - c)  $180^\circ$
  - d)  $360^\circ$

Seat No.	
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Set

P

**T. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Machine Design - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the various types of gear tooth failures? State their causes and Remedies. **06**
- b) A pair of spur gears with  $20^\circ$  full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of  $600 \text{ N/mm}^2$ . The gears are heat treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit. (Lewis form factor is 0.32 for 20 teeth) **08**
- Q.3** a) Derive the expression for virtual number of teeth for helical gears. **06**
- b) A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is  $20^\circ$ , while the helix angle is  $25^\circ$ . The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 ( $S_{ut} = 600 \text{ N/mm}^2$ ) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. ( $Y = 0.3475$ ) **08**
- Q.4** a) Explain the following terms **06**  
 i. Frequency distribution  
 ii. Probability distribution  
 iii. Normal curve
- b) What is autofrettage? What are the methods of pre-stressing the cylinder? **04**
- c) The inner diameter of a cylindrical tank for liquefied gas is 250 mm. The gas pressure is limited to 15 MPa. The tank is made of plain carbon steel 10C4 ( $S_{ut} = 340 \text{ N/mm}^2$  and  $m = 0.27$ ) and the factor of safety is 5. Calculate the cylinder wall thickness. **04**

## Section – II

- Q.5** a) Draw neat sketch of bevel gear indicating its terminology **06**  
 b) A pair of bevel gears, with  $20^\circ$  pressure angle, consists of a 20 teeth pinion meshing with a 30 teeth gear. The module is 4 mm, while the face width is 20 mm. The material for the pinion and gear is steel 50C4 ( $S_{ut} = 750 \text{ N/mm}^2$ ). The gear teeth are lapped and ground (Class-3) and the surface hardness is 400 BHN. The pinion rotates at 500 rpm and receives 2.5 kW power from the electric motor. The starting torque of the motor is 150% of the rated torque. Determine the factor of safety against bending failure and against pitting failure. ( $Y = 0.33712$ ) **08**
- Q.6** a) Explain power transmitting capacity of worm gears based on thermal consideration. **06**  
 b) 1 kW power at 720 rpm is supplied to the worm shaft. The number of starts for threads of the worm is four with a 50 mm pitch-circle diameter. The worm wheel has 30 teeth with 5 mm module. The normal pressure angle is  $20^\circ$ . Calculate the efficiency of the worm gear drive and the power lost in friction. **08**
- Q.7** a) A single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3 kN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75 mm and Bearing No. 6315 ( $C = 112\,000 \text{ N}$ ) is selected for this application. **06**  
 i) Estimate the life of this bearing, with 90% reliability.  
 ii) Estimate the reliability for 20 000 h life.
- b) The following data is given for a  $360^\circ$  hydrodynamic bearing: **08**  
 radial load = 3.2 kN, journal speed = 1490 rpm, Journal diameter = 50 mm, bearing length = 50 mm, radial clearance = 0.05 mm, viscosity of lubricant = 25 cP  
 Assuming that the total heat generated in the bearing is carried by the total oil flow in the bearing, calculate  
 i) coefficient of friction;  
 ii) power lost in friction;  
 iii) minimum oil film thickness;  
 iv) flow requirement in liters/min; and  
 v) temperature rise.  
 For  $S = 0.121$ ,  $1/d = 1$   

$$\left(\frac{r}{c}\right) f = 3.22 \left(\frac{h_0}{c}\right) = 0.4 \frac{Q}{rcn_1 l} = 4.33$$

Seat No.	
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Set Q
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**T. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Machine Design - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) A cylinder is considered as thin cylinder when the ratio of inner diameter to the wall thickness is,
 

a) more than 15	b) less than 15
c) equal to 15	d) none of these criteria
- 2) The thickness of thin cylinder is determined on the basis of,
 

a) radial stress	b) longitudinal stress
c) circumferential stress	d) principal shear stress
- 3) The thickness of thick cylinder shell with open ends and made of ductile material is determined by \_\_\_\_\_.
 

a) Lamé's equation	b) Clavarino's equation
c) Birnie's equation	d) Barlow's equation
- 4) Autofrettage is,
 

a) a surface coating process of cylinders for corrosion resistance
b) a heat treatment process for cylinders to relieve residual stresses
c) a process of pre-stressing the cylinder to develop residual compressive stress at the inner surface
d) a surface hardening process of cylinder to improve wear resistance
- 5) In radial bearings, the load acts
 

a) along the axis of rotation
b) perpendicular to the axis of rotation
c) parallel to the axis of rotation
d) a and c
- 6) Rolling contact bearings as compared to sliding contact bearings have
 

a) lower starting torque
b) require considerable axial space
c) generate less noise
d) costly
- 7) In case of full journal bearing, the angle of contact of the bushing with the journal is
 

a) 60°	b) 90°
c) 180°	d) 360°



- 8) When the axes of two shafts are parallel, use \_\_\_\_\_.  
a) crossed helical gears                      b) bevel  
c) worm gears                                  d) spur or helical gears
- 9) Which of the following type of gears are free from axial thrust?  
a) Herringbone gears                      b) Bevel gears  
c) Worm gears                                  d) Helical gears
- 10) The initial contact in helical gears is \_\_\_\_\_.  
a) point    b) line  
c) surface                                      d) unpredictable
- 11) When two bevel gears having equal teeth and equal pitch angle are used to transmit power between shafts that are intersecting at right angle, they are called,  
a) spiral bevel gears                      b) Miter gears  
c) straight bevel gears                      d) hypoid gears
- 12) When bevel gears are used to transmit power between shafts that are intersecting at an angle greater than  $90^\circ$ , and if the pitch angle of one of the gears is  $90^\circ$ , they are called,  
a) spiral bevel gears                      b) crown gears  
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- 13) Worm gears are widely used when  
a) velocity ratio is high  
b) space is limited  
c) axes of shafts are non-intersecting  
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- 14) The axial component of resultant force on worm wheel is equal to  
a) tangential component on worm  
b) radial component on worm  
c) axial component on worm  
d) none of the above

Seat No.	
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Set Q
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**T. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Machine Design - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the various types of gear tooth failures? State their causes and Remedies. **06**
- b) A pair of spur gears with  $20^\circ$  full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of  $600 \text{ N/mm}^2$ . The gears are heat treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit. (Lewis form factor is 0.32 for 20 teeth) **08**
- Q.3** a) Derive the expression for virtual number of teeth for helical gears. **06**
- b) A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is  $20^\circ$ , while the helix angle is  $25^\circ$ . The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 ( $S_{ut} = 600 \text{ N/mm}^2$ ) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. ( $Y = 0.3475$ ) **08**
- Q.4** a) Explain the following terms **06**  
 i. Frequency distribution  
 ii. Probability distribution  
 iii. Normal curve
- b) What is autofrettage? What are the methods of pre-stressing the cylinder? **04**
- c) The inner diameter of a cylindrical tank for liquefied gas is 250 mm. The gas pressure is limited to 15 MPa. The tank is made of plain carbon steel 10C4 ( $S_{ut} = 340 \text{ N/mm}^2$  and  $m = 0.27$ ) and the factor of safety is 5. Calculate the cylinder wall thickness. **04**

## Section – II

- Q.5** a) Draw neat sketch of bevel gear indicating its terminology **06**  
 b) A pair of bevel gears, with 20° pressure angle, consists of a 20 teeth pinion meshing with a 30 teeth gear. The module is 4 mm, while the face width is 20 mm. The material for the pinion and gear is steel 50C4 ( $S_{ut} = 750 \text{ N/mm}^2$ ). The gear teeth are lapped and ground (Class-3) and the surface hardness is 400 BHN. The pinion rotates at 500 rpm and receives 2.5 kW power from the electric motor. The starting torque of the motor is 150% of the rated torque. Determine the factor of safety against bending failure and against pitting failure. ( $Y = 0.33712$ ) **08**
- Q.6** a) Explain power transmitting capacity of worm gears based on thermal consideration. **06**  
 b) 1 kW power at 720 rpm is supplied to the worm shaft. The number of starts for threads of the worm is four with a 50 mm pitch-circle diameter. The worm wheel has 30 teeth with 5 mm module. The normal pressure angle is 20°. Calculate the efficiency of the worm gear drive and the power lost in friction. **08**
- Q.7** a) A single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3 kN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75 mm and Bearing No. 6315 ( $C = 112\,000 \text{ N}$ ) is selected for this application. **06**  
 i) Estimate the life of this bearing, with 90% reliability.  
 ii) Estimate the reliability for 20 000 h life.
- b) The following data is given for a 360° hydrodynamic bearing: **08**  
 radial load = 3.2 kN, journal speed = 1490 rpm, Journal diameter = 50 mm, bearing length = 50 mm, radial clearance = 0.05 mm, viscosity of lubricant = 25 cP  
 Assuming that the total heat generated in the bearing is carried by the total oil flow in the bearing, calculate  
 i) coefficient of friction;  
 ii) power lost in friction;  
 iii) minimum oil film thickness;  
 iv) flow requirement in liters/min; and  
 v) temperature rise.  
 For  $S = 0.121$ ,  $1/d = 1$   

$$\left(\frac{r}{c}\right) f = 3.22 \left(\frac{h_0}{c}\right) = 0.4 \frac{Q}{rcn_1 l} = 4.33$$

Seat No.	
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Set	R
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**T. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Machine Design - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Autofrettage is,
  - a) a surface coating process of cylinders for corrosion resistance
  - b) a heat treatment process for cylinders to relieve residual stresses
  - c) a process of pre-stressing the cylinder to develop residual compressive stress at the inner surface
  - d) a surface hardening process of cylinder to improve wear resistance
- 2) In radial bearings, the load acts
  - a) along the axis of rotation
  - b) perpendicular to the axis of rotation
  - c) parallel to the axis of rotation
  - d) a and c
- 3) Rolling contact bearings as compared to sliding contact bearings have
  - a) lower starting torque
  - b) require considerable axial space
  - c) generate less noise
  - d) costly
- 4) In case of full journal bearing, the angle of contact of the bushing with the journal is
 

a) 60°	b) 90°
c) 180°	d) 360°
- 5) When the axes of two shafts are parallel, use \_\_\_\_\_.
 

a) crossed helical gears	b) bevel
c) worm gears	d) spur or helical gears
- 6) Which of the following type of gears are free from axial thrust?
 

a) Herringbone gears	b) Bevel gears
c) Worm gears	d) Helical gears
- 7) The initial contact in helical gears is \_\_\_\_\_.
 

a) point	b) line
c) surface	d) unpredictable

- 8) When two bevel gears having equal teeth and equal pitch angle are used to transmit power between shafts that are intersecting at right angle, they are called,
- a) spiral bevel gears
  - b) Miter gears
  - c) straight bevel gears
  - d) hypoid gears
- 9) When bevel gears are used to transmit power between shafts that are intersecting at an angle greater than  $90^\circ$ , and if the pitch angle of one of the gears is  $90^\circ$ , they are called,
- a) spiral bevel gears
  - b) crown gears
  - c) straight bevel gears
  - d) hypoid gears
- 10) Worm gears are widely used when
- a) velocity ratio is high
  - b) space is limited
  - c) axes of shafts are non-intersecting
  - d) all the three
- 11) The axial component of resultant force on worm wheel is equal to
- a) tangential component on worm
  - b) radial component on worm
  - c) axial component on worm
  - d) none of the above
- 12) A cylinder is considered as thin cylinder when the ratio of inner diameter to the wall thickness is,
- a) more than 15
  - b) less than 15
  - c) equal to 15
  - d) none of these criteria
- 13) The thickness of thin cylinder is determined on the basis of,
- a) radial stress
  - b) longitudinal stress
  - c) circumferential stress
  - d) principal shear stress
- 14) The thickness of thick cylinder shell with open ends and made of ductile material is determined by \_\_\_\_\_.
- a) Lamé's equation
  - b) Clavarino's equation
  - c) Birnie's equation
  - d) Barlow's equation

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**T. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Machine Design - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the various types of gear tooth failures? State their causes and Remedies. **06**
- b) A pair of spur gears with  $20^\circ$  full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of  $600 \text{ N/mm}^2$ . The gears are heat treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit. (Lewis form factor is 0.32 for 20 teeth) **08**
- Q.3** a) Derive the expression for virtual number of teeth for helical gears. **06**
- b) A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is  $20^\circ$ , while the helix angle is  $25^\circ$ . The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 ( $S_{ut} = 600 \text{ N/mm}^2$ ) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. ( $Y = 0.3475$ ) **08**
- Q.4** a) Explain the following terms **06**  
 i. Frequency distribution  
 ii. Probability distribution  
 iii. Normal curve
- b) What is autofrettage? What are the methods of pre-stressing the cylinder? **04**
- c) The inner diameter of a cylindrical tank for liquefied gas is 250 mm. The gas pressure is limited to 15 MPa. The tank is made of plain carbon steel 10C4 ( $S_{ut} = 340 \text{ N/mm}^2$  and  $m = 0.27$ ) and the factor of safety is 5. Calculate the cylinder wall thickness. **04**

## Section – II

- Q.5** a) Draw neat sketch of bevel gear indicating its terminology **06**  
 b) A pair of bevel gears, with 20° pressure angle, consists of a 20 teeth pinion meshing with a 30 teeth gear. The module is 4 mm, while the face width is 20 mm. The material for the pinion and gear is steel 50C4 ( $S_{ut} = 750 \text{ N/mm}^2$ ). The gear teeth are lapped and ground (Class-3) and the surface hardness is 400 BHN. The pinion rotates at 500 rpm and receives 2.5 kW power from the electric motor. The starting torque of the motor is 150% of the rated torque. Determine the factor of safety against bending failure and against pitting failure. ( $Y = 0.33712$ ) **08**
- Q.6** a) Explain power transmitting capacity of worm gears based on thermal consideration. **06**  
 b) 1 kW power at 720 rpm is supplied to the worm shaft. The number of starts for threads of the worm is four with a 50 mm pitch-circle diameter. The worm wheel has 30 teeth with 5 mm module. The normal pressure angle is 20°. Calculate the efficiency of the worm gear drive and the power lost in friction. **08**
- Q.7** a) A single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3 kN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75 mm and Bearing No. 6315 ( $C = 112\,000 \text{ N}$ ) is selected for this application. **06**  
 i) Estimate the life of this bearing, with 90% reliability.  
 ii) Estimate the reliability for 20 000 h life.
- b) The following data is given for a 360° hydrodynamic bearing: **08**  
 radial load = 3.2 kN, journal speed = 1490 rpm, Journal diameter = 50 mm, bearing length = 50 mm, radial clearance = 0.05 mm, viscosity of lubricant = 25 cP  
 Assuming that the total heat generated in the bearing is carried by the total oil flow in the bearing, calculate  
 i) coefficient of friction;  
 ii) power lost in friction;  
 iii) minimum oil film thickness;  
 iv) flow requirement in liters/min; and  
 v) temperature rise.  
 For  $S = 0.121$ ,  $1/d = 1$   

$$\left(\frac{r}{c}\right) f = 3.22 \left(\frac{h_0}{c}\right) = 0.4 \frac{Q}{rcn_1 l} = 4.33$$

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**T. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Machine Design - II**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Worm gears are widely used when
  - a) velocity ratio is high
  - b) space is limited
  - c) axes of shafts are non-intersecting
  - d) all the three
- 2) The axial component of resultant force on worm wheel is equal to
  - a) tangential component on worm
  - b) radial component on worm
  - c) axial component on worm
  - d) none of the above
- 3) A cylinder is considered as thin cylinder when the ratio of inner diameter to the wall thickness is,
  - a) more than 15
  - b) less than 15
  - c) equal to 15
  - d) none of these criteria
- 4) The thickness of thin cylinder is determined on the basis of,
  - a) radial stress
  - b) longitudinal stress
  - c) circumferential stress
  - d) principal shear stress
- 5) The thickness of thick cylinder shell with open ends and made of ductile material is determined by \_\_\_\_\_.
  - a) Lamé's equation
  - b) Clavarino's equation
  - c) Birnie's equation
  - d) Barlow's equation
- 6) Autofrettage is,
  - a) a surface coating process of cylinders for corrosion resistance
  - b) a heat treatment process for cylinders to relieve residual stresses
  - c) a process of pre-stressing the cylinder to develop residual compressive stress at the inner surface
  - d) a surface hardening process of cylinder to improve wear resistance
- 7) In radial bearings, the load acts
  - a) along the axis of rotation
  - b) perpendicular to the axis of rotation
  - c) parallel to the axis of rotation
  - d) a and c



- 8) Rolling contact bearings as compared to sliding contact bearings have
- a) lower starting torque
  - b) require considerable axial space
  - c) generate less noise
  - d) costly
- 9) In case of full journal bearing, the angle of contact of the bushing with the journal is
- a)  $60^\circ$
  - b)  $90^\circ$
  - c)  $180^\circ$
  - d)  $360^\circ$
- 10) When the axes of two shafts are parallel, use \_\_\_\_.
- a) crossed helical gears
  - b) bevel
  - c) worm gears
  - d) spur or helical gears
- 11) Which of the following type of gears are free from axial thrust?
- a) Herringbone gears
  - b) Bevel gears
  - c) Worm gears
  - d) Helical gears
- 12) The initial contact in helical gears is \_\_\_\_.
- a) point
  - b) line
  - c) surface
  - d) unpredictable
- 13) When two bevel gears having equal teeth and equal pitch angle are used to transmit power between shafts that are intersecting at right angle, they are called,
- a) spiral bevel gears
  - b) Miter gears
  - c) straight bevel gears
  - d) hypoid gears
- 14) When bevel gears are used to transmit power between shafts that are intersecting at an angle greater than  $90^\circ$ , and if the pitch angle of one of the gears is  $90^\circ$ , they are called,
- a) spiral bevel gears
  - b) crown gears
  - c) straight bevel gears
  - d) hypoid gears

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**T. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Machine Design - II**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the various types of gear tooth failures? State their causes and Remedies. **06**
- b) A pair of spur gears with  $20^\circ$  full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of  $600 \text{ N/mm}^2$ . The gears are heat treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit. (Lewis form factor is 0.32 for 20 teeth) **08**
- Q.3** a) Derive the expression for virtual number of teeth for helical gears. **06**
- b) A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is  $20^\circ$ , while the helix angle is  $25^\circ$ . The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 ( $S_{ut} = 600 \text{ N/mm}^2$ ) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. ( $Y = 0.3475$ ) **08**
- Q.4** a) Explain the following terms **06**  
 i. Frequency distribution  
 ii. Probability distribution  
 iii. Normal curve
- b) What is autofrettage? What are the methods of pre-stressing the cylinder? **04**
- c) The inner diameter of a cylindrical tank for liquefied gas is 250 mm. The gas pressure is limited to 15 MPa. The tank is made of plain carbon steel 10C4 ( $S_{ut} = 340 \text{ N/mm}^2$  and  $m = 0.27$ ) and the factor of safety is 5. Calculate the cylinder wall thickness. **04**

## Section – II

- Q.5** a) Draw neat sketch of bevel gear indicating its terminology **06**  
 b) A pair of bevel gears, with  $20^\circ$  pressure angle, consists of a 20 teeth pinion meshing with a 30 teeth gear. The module is 4 mm, while the face width is 20 mm. The material for the pinion and gear is steel 50C4 ( $S_{ut} = 750 \text{ N/mm}^2$ ). The gear teeth are lapped and ground (Class-3) and the surface hardness is 400 BHN. The pinion rotates at 500 rpm and receives 2.5 kW power from the electric motor. The starting torque of the motor is 150% of the rated torque. Determine the factor of safety against bending failure and against pitting failure. ( $Y = 0.33712$ ) **08**
- Q.6** a) Explain power transmitting capacity of worm gears based on thermal consideration. **06**  
 b) 1 kW power at 720 rpm is supplied to the worm shaft. The number of starts for threads of the worm is four with a 50 mm pitch-circle diameter. The worm wheel has 30 teeth with 5 mm module. The normal pressure angle is  $20^\circ$ . Calculate the efficiency of the worm gear drive and the power lost in friction. **08**
- Q.7** a) A single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3 kN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75 mm and Bearing No. 6315 ( $C = 112\,000 \text{ N}$ ) is selected for this application. **06**  
 i) Estimate the life of this bearing, with 90% reliability.  
 ii) Estimate the reliability for 20 000 h life.
- b) The following data is given for a  $360^\circ$  hydrodynamic bearing: **08**  
 radial load = 3.2 kN, journal speed = 1490 rpm, Journal diameter = 50 mm, bearing length = 50 mm, radial clearance = 0.05 mm, viscosity of lubricant = 25 cP  
 Assuming that the total heat generated in the bearing is carried by the total oil flow in the bearing, calculate  
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 ii) power lost in friction;  
 iii) minimum oil film thickness;  
 iv) flow requirement in liters/min; and  
 v) temperature rise.  
 For  $S = 0.121$ ,  $1/d = 1$   

$$\left(\frac{r}{c}\right) f = 3.22 \left(\frac{h_0}{c}\right) = 0.4 \frac{Q}{rcn_1 l} = 4.33$$

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Instrumentation & Control**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Intermediate stage of an instrument is used to \_\_\_\_\_.  
 a) sense primary signal                      b) condition & transmit the signal  
 c) give a record or indication              d) covert the signal form
- 2) A dead weight pressure gauge is used for \_\_\_\_\_.  
 a) producing high pressures  
 b) accurate load measurement  
 c) checking magnitude of given weight  
 d) calibrating mechanical pressure gauges
- 3) Unit of thermoelectric power is \_\_\_\_\_.  
 a)  $\text{mV}/^{\circ}\text{C}$                                       b)  $^{\circ}\text{C}/\text{mV}$   
 c)  $\text{mA}/^{\circ}\text{C}$                                       d)  $^{\circ}\text{C}/\text{mA}$
- 4) If we observe two stationary images of a mark on a rotating shaft, \_\_\_\_\_.  
 a)  $f_r = 2f_f$                                       b)  $f_f = f_r$   
 c)  $f_f = 2f_r$                                       d)  $f_f = 1/2 f_r$
- 5) Change in resistance of a wire by positioning of a slider is used in \_\_\_\_\_.  
 a) potentiometer                              b) electric tachometer  
 c) turbine meter                              d) LVDT
- 6) The Hydraulic load Cell is used to measure load up to \_\_\_\_\_.  
 a) 25 MN    b) 250 MN  
 c) 2.5 MN    d) 0.5 MN
- 7) The gauge factor of strain gauge defines \_\_\_\_\_.  
 a)  $K = \Delta R$                                       b)  $K = R/L$   
 c)  $K = \Delta R/\Delta L$                               d)  $K = (\Delta R/R)/(\Delta L/L)$
- 8) An air conditioner is an example of \_\_\_\_\_.  
 a) manual open loop system              b) manual closed loop system  
 c) automatic open loop system            d) automatic closed loop system
- 9) Derivative Time is given by \_\_\_\_\_.  
 a)  $K_d/K_p$     b)  $K_p/K_d$   
 c)  $K_d/K_i$     d)  $K_i/K_d$



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Set **P**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Instrumentation & Control**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

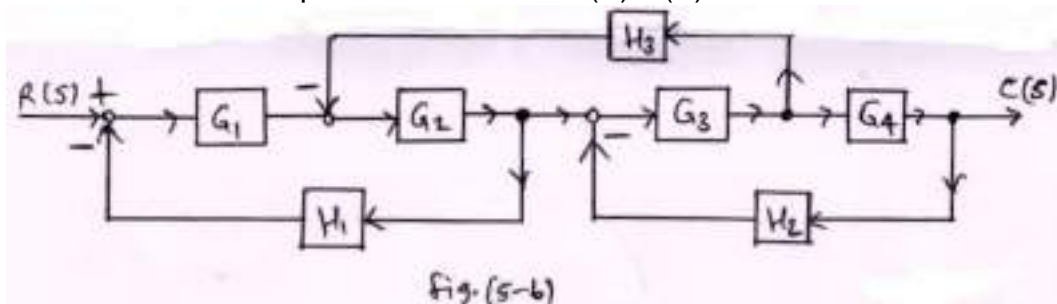
- Instructions:** 1) Solve any two questions from each section  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks  
 4) Assume additional suitable data if necessary and state it clearly.  
 5) Use university graph paper & semi-long paper if required.

**Section – I**

- Q.2** a) Explain following system characteristics. **04**  
 i) precision  
 ii) fidelity  
 b) Explain with a neat sketch 'Rotameter'. **06**  
 c) Explain the basic principle of working of 'Thermistors'. **04**
- Q.3** a) Explain with a block diagram 'Generalised Measurement System'. **06**  
 b) Explain with a neat sketch 'Inductive Pickup Tachometer'. **04**  
 c) Explain with a neat sketch 'Prony Brake Dynamometer'. **04**
- Q.4** a) Derive the expression for Gauge Factor for an electrical strain gauge. **06**  
 b) Explain with a neat sketch working of 'L.V.D.T.'. **04**  
 c) Explain with a neat sketch working of 'Proving Ring' for force measurement. **04**

**Section – II**

- Q.5** a) Explain with a suitable example Automatic Control System. **05**  
 b) For the block diagram of a feedback control system as shown in fig. (5-b), obtain the closed loop transfer function  $C(S)/R(S)$ . **06**



- c) Explain the 'Angle Condition' in Root Locus and its importance. **03**
- Q.6** a) For a control system represented by, **09**

$$G(S)H(S) = \frac{K}{S(S^2 + 2S + 2)}$$

Sketch the complete Root Locus and comment on the system stability.

- b)** Explain with a graph, P + I control system. What do you mean by 'Integral Time'? **05**

- Q.7 a)** For a unity feedback system given by, **08**

$$G(S) = \frac{80(S + 2)}{S(S + 2)(S + 20)}$$

Sketch the Bode Plots and comment on the system stability.

- b)** State general predictions to identify break away points in root locus on the real axis. **03**
- c)** Explain nature of Bode Plots for the poles and zeros at the origin. **03**

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Set Q
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Instrumentation & Control**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) An air conditioner is an example of \_\_\_\_\_.  
 a) manual open loop system      b) manual closed loop system  
 c) automatic open loop system      d) automatic closed loop system
- 2) Derivative Time is given by \_\_\_\_\_.  
 a)  $K_d/K_p$       b)  $K_p/K_d$   
 c)  $K_d/K_i$       d)  $K_i/K_d$
- 3) In block diagram algebra, series blocks are \_\_\_\_\_.  
 a) added      b) integrated  
 c) multiplied      d) subtracted
- 4) Angles of departure are needed in a root locus if a system has \_\_\_\_\_.  
 a) real poles      b) real zeros  
 c) complex conjugate poles      d) complex conjugate zeros
- 5) A root locus has any branches approaching infinity when \_\_\_\_\_.  
 a)  $P = Z$       b)  $P > Z$   
 c)  $Z > P$       d)  $Z = 0$
- 6) 'Gain Margin' is always calculated at \_\_\_\_\_.  
 a) gain cross-over frequency      b) resonant frequency  
 c) corner frequency      d) phase cross-over frequency
- 7) For a marginally stable system, \_\_\_\_\_.  
 a) G.M. & P.M. are positive      b) G.M. & P.M. are zero  
 c) G.M. & P.M. are infinity      d) G.M. & P.M. are negative
- 8) Intermediate stage of an instrument is used to \_\_\_\_\_.  
 a) sense primary signal      b) condition & transmit the signal  
 c) give a record or indication      d) covert the signal form
- 9) A dead weight pressure gauge is used for \_\_\_\_\_.  
 a) producing high pressures  
 b) accurate load measurement  
 c) checking magnitude of given weight  
 d) calibrating mechanical pressure gauges





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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Instrumentation & Control**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

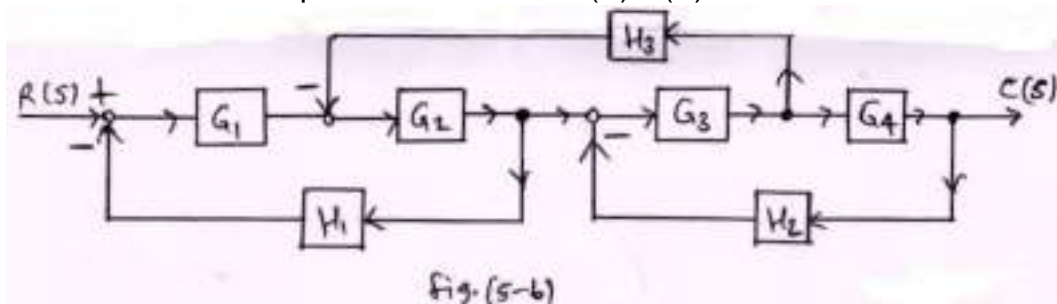
- Instructions:** 1) Solve any two questions from each section  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks  
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**Section – I**

- Q.2** a) Explain following system characteristics. **04**  
 i) precision  
 ii) fidelity  
 b) Explain with a neat sketch 'Rotameter'. **06**  
 c) Explain the basic principle of working of 'Thermistors'. **04**
- Q.3** a) Explain with a block diagram 'Generalised Measurement System'. **06**  
 b) Explain with a neat sketch 'Inductive Pickup Tachometer'. **04**  
 c) Explain with a neat sketch 'Prony Brake Dynamometer'. **04**
- Q.4** a) Derive the expression for Gauge Factor for an electrical strain gauge. **06**  
 b) Explain with a neat sketch working of 'L.V.D.T.'. **04**  
 c) Explain with a neat sketch working of 'Proving Ring' for force measurement. **04**

**Section – II**

- Q.5** a) Explain with a suitable example Automatic Control System. **05**  
 b) For the block diagram of a feedback control system as shown in fig. (5-b), obtain the closed loop transfer function  $C(S)/R(S)$ . **06**



- c) Explain the 'Angle Condition' in Root Locus and its importance. **03**
- Q.6** a) For a control system represented by, **09**

$$G(S)H(S) = \frac{K}{S(S^2 + 2S + 2)}$$

Sketch the complete Root Locus and comment on the system stability.

- b) Explain with a graph, P + I control system. What do you mean by 'Integral Time'? **05**

- Q.7** a) For a unity feedback system given by, **08**

$$G(S) = \frac{80(S + 2)}{S(S + 2)(S + 20)}$$

Sketch the Bode Plots and comment on the system stability.

- b) State general predictions to identify break away points in root locus on the real axis. **03**
- c) Explain nature of Bode Plots for the poles and zeros at the origin. **03**

**Seat  
No.**

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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks: 14

14

- 1) Angles of departure are needed in a root locus if a system has \_\_\_\_\_.  
a) real poles                      b) real zeros  
c) complex conjugate poles    d) complex conjugate zeros
- 2) A root locus has any branches approaching infinity when \_\_\_\_\_.  
a)  $P = Z$                           b)  $P > Z$   
c)  $Z > P$                           d)  $Z = 0$
- 3) 'Gain Margin' is always calculated at \_\_\_\_\_.  
a) gain cross-over frequency    b) resonant frequency  
c) corner frequency               d) phase cross-over frequency
- 4) For a marginally stable system, \_\_\_\_\_.  
a) G.M. & P.M. are positive     b) G.M. & P.M. are zero  
c) G.M. & P.M. are infinity       d) G.M. & P.M. are negative
- 5) Intermediate stage of an instrument is used to \_\_\_\_\_.  
a) sense primary signal           b) condition & transmit the signal  
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- 6) A dead weight pressure gauge is used for \_\_\_\_\_.  
a) producing high pressures  
b) accurate load measurement  
c) checking magnitude of given weight  
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- 7) Unit of thermoelectric power is \_\_\_\_\_.  
a) mV/ $^{\circ}\text{C}$                           b)  $^{\circ}\text{C}/\text{mV}$   
c) mA/ $^{\circ}\text{C}$                           d)  $^{\circ}\text{C}/\text{mA}$
- 8) If we observe two stationary images of a mark on a rotating shaft, \_\_\_\_\_.  
a)  $f_r = 2f_f$                           b)  $f_f = f_r$   
c)  $f_f = 2f_r$                           d)  $f_f = 1/2 f_r$
- 9) Change in resistance of a wire by positioning of a slider is used in \_\_\_\_\_.  
a) potentiometer                   b) electric tachometer  
c) turbine meter                   d) LVDT

- 10)** The Hydraulic load Cell is used to measure load up to \_\_\_\_\_.  
a) 25 MN                                      b) 250 MN  
c) 2.5 MN                                     d) 0.5 MN
- 11)** The gauge factor of strain gauge defines \_\_\_\_\_.  
a)  $K = \Delta R$                                 b)  $K = R/L$   
c)  $K = \Delta R/\Delta L$                           d)  $K = (\Delta R/R)/(\Delta L/L)$
- 12)** An air conditioner is an example of \_\_\_\_\_.  
a) manual open loop system              b) manual closed loop system  
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- 13)** Derivative Time is given by \_\_\_\_\_.  
a)  $K_d/K_p$                                       b)  $K_p/K_d$   
c)  $K_d/K_i$                                       d)  $K_i/K_d$
- 14)** In block diagram algebra, series blocks are \_\_\_\_\_.  
a) added                                        b) integrated  
c) multiplied                                  d) subtracted

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Set **R**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Instrumentation & Control**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

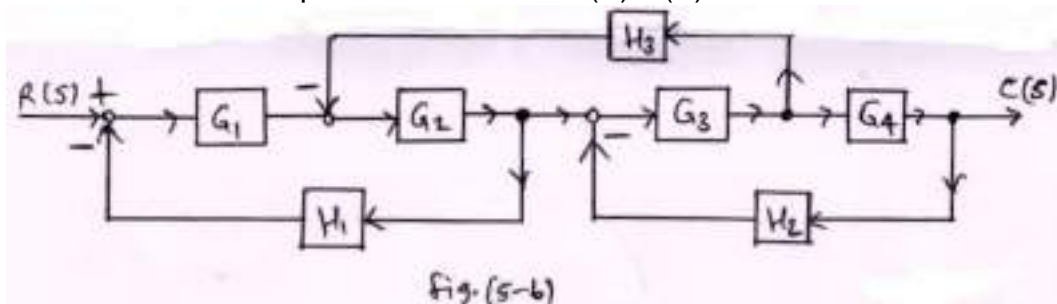
- Instructions:** 1) Solve any two questions from each section  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks  
 4) Assume additional suitable data if necessary and state it clearly.  
 5) Use university graph paper & semi-long paper if required.

**Section – I**

- Q.2** a) Explain following system characteristics. **04**  
       i) precision  
       ii) fidelity  
 b) Explain with a neat sketch 'Rotameter'. **06**  
 c) Explain the basic principle of working of 'Thermistors'. **04**
- Q.3** a) Explain with a block diagram 'Generalised Measurement System'. **06**  
 b) Explain with a neat sketch 'Inductive Pickup Tachometer'. **04**  
 c) Explain with a neat sketch 'Prony Brake Dynamometer'. **04**
- Q.4** a) Derive the expression for Gauge Factor for an electrical strain gauge. **06**  
 b) Explain with a neat sketch working of 'L.V.D.T.'. **04**  
 c) Explain with a neat sketch working of 'Proving Ring' for force measurement. **04**

**Section – II**

- Q.5** a) Explain with a suitable example Automatic Control System. **05**  
 b) For the block diagram of a feedback control system as shown in fig. (5-b), obtain the closed loop transfer function  $C(S)/R(S)$ . **06**



- c) Explain the 'Angle Condition' in Root Locus and its importance. **03**
- Q.6** a) For a control system represented by, **09**

$$G(S)H(S) = \frac{K}{S(S^2 + 2S + 2)}$$

Sketch the complete Root Locus and comment on the system stability.

- b) Explain with a graph, P + I control system. What do you mean by 'Integral Time'? **05**

- Q.7** a) For a unity feedback system given by, **08**

$$G(S) = \frac{80(S + 2)}{S(S + 2)(S + 20)}$$

Sketch the Bode Plots and comment on the system stability.

- b) State general predictions to identify break away points in root locus on the real axis. **03**
- c) Explain nature of Bode Plots for the poles and zeros at the origin. **03**

**Seat  
No.**

Page 13 of 16



- 11) A dead weight pressure gauge is used for \_\_\_\_\_.  
a) producing high pressures  
b) accurate load measurement  
c) checking magnitude of given weight  
d) calibrating mechanical pressure gauges
- 12) Unit of thermoelectric power is \_\_\_\_\_.  
a)  $\text{mV}/^{\circ}\text{C}$   
b)  $^{\circ}\text{C}/\text{mV}$   
c)  $\text{mA}/^{\circ}\text{C}$   
d)  $^{\circ}\text{C}/\text{mA}$
- 13) If we observe two stationary images of a mark on a rotating shaft, \_\_\_\_\_.  
a)  $f_r = 2f_f$   
b)  $f_f = f_r$   
c)  $f_f = 2f_r$   
d)  $f_f = 1/2 f_r$
- 14) Change in resistance of a wire by positioning of a slider is used in \_\_\_\_\_.  
a) potentiometer  
b) electric tachometer  
c) turbine meter  
d) LVDT

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Instrumentation & Control**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

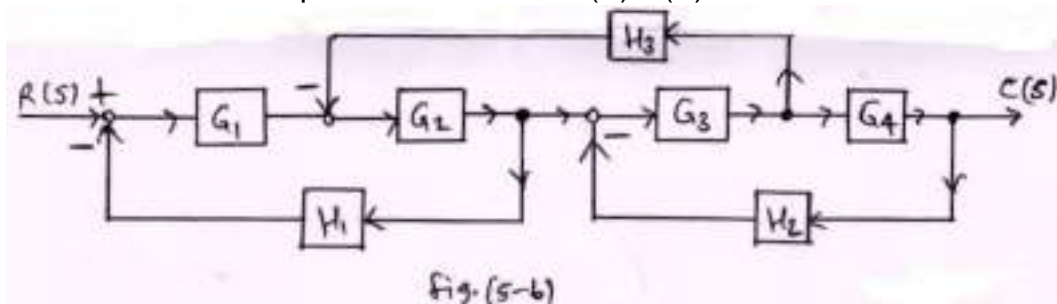
- Instructions:** 1) Solve any two questions from each section  
 2) Use of scientific calculator is allowed.  
 3) Figures to right indicate full marks  
 4) Assume additional suitable data if necessary and state it clearly.  
 5) Use university graph paper & semi-long paper if required.

**Section – I**

- Q.2** a) Explain following system characteristics. **04**  
       i) precision  
       ii) fidelity  
 b) Explain with a neat sketch 'Rotameter'. **06**  
 c) Explain the basic principle of working of 'Thermistors'. **04**
- Q.3** a) Explain with a block diagram 'Generalised Measurement System'. **06**  
 b) Explain with a neat sketch 'Inductive Pickup Tachometer'. **04**  
 c) Explain with a neat sketch 'Prony Brake Dynamometer'. **04**
- Q.4** a) Derive the expression for Gauge Factor for an electrical strain gauge. **06**  
 b) Explain with a neat sketch working of 'L.V.D.T.'. **04**  
 c) Explain with a neat sketch working of 'Proving Ring' for force measurement. **04**

**Section – II**

- Q.5** a) Explain with a suitable example Automatic Control System. **05**  
 b) For the block diagram of a feedback control system as shown in fig. (5-b), obtain the closed loop transfer function  $C(S)/R(S)$ . **06**



- c) Explain the 'Angle Condition' in Root Locus and its importance. **03**
- Q.6** a) For a control system represented by, **09**

$$G(S)H(S) = \frac{K}{S(S^2 + 2S + 2)}$$

Sketch the complete Root Locus and comment on the system stability.

- b) Explain with a graph, P + I control system. What do you mean by 'Integral Time'? **05**

- Q.7** a) For a unity feedback system given by, **08**

$$G(S) = \frac{80(S + 2)}{S(S + 2)(S + 20)}$$

Sketch the Bode Plots and comment on the system stability.

- b) State general predictions to identify break away points in root locus on the real axis. **03**
- c) Explain nature of Bode Plots for the poles and zeros at the origin. **03**

Seat No.	
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Set	P
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Heat Transfer**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Thermal conductivity of solid metals \_\_\_\_\_ with rise in temperature.
  - a) decreases
  - b) increases
  - c) remains same
  - d) unpredictable
- 2) Thermal diffusivity of a substance is \_\_\_\_\_.
  - a) directly proportional to the thermal conductivity
  - b) inversely proportional to the density of substance
  - c) inversely proportional to specific heat
  - d) all above
- 3) Which one of the dimensionless number has significant role in natural convection?
  - a) Stanton
  - b) Grashoff
  - c) Reynolds
  - d) Nusselt
- 4) The radiation shape factor between two parallel plates is \_\_\_\_\_.
  - a) 1
  - b) 0
  - c) 0.5
  - d) 0.33
- 5) Up to the critical radius of insulation \_\_\_\_\_.
  - a) Heat loss decreases with addition of insulation
  - b) Heat loss increases with addition of insulation
  - c) Heat loss remains constant
  - d) There occurs a decrease in heat flux
- 6) Which type of heat exchanger is used in automobile radiator?
  - a) Parallel flow
  - b) Counter flow
  - c) Cross flow
  - d) Regenerator
- 7) Dropwise condensation usually occurs in \_\_\_\_\_.
  - a) Oily surfaces
  - b) Glazed surface
  - c) Smooth surface
  - d) Coated surface
- 8) Compared to parallel flow heat exchanger, LMTD in the case of counter flow heat exchanger is \_\_\_\_\_.
  - a) lower
  - b) higher
  - c) same
  - d) unpredictable

- 9)** A \_\_\_\_\_ body reflects entire radiation incident on it.  
a) black                                      b) gray  
c) white                                        d) transparent
- 10)** The parameter NTU (Number of transfer units) used in the analysis of heat exchanger is specified as \_\_\_\_\_.  
a)  $UA/C_{\min}$                                   b)  $AUC_{\min}$   
c)  $U/AC_{\min}$                                  d)  $AC_{\min}/U$
- 11)** In fins parameter ‘m’ equals to \_\_\_\_\_.  
**a)**  $m = \sqrt{\frac{hp}{KA_{c/s}}}$   
**b)**  $m = \sqrt{\frac{KA_{c/s}}{hp}}$   
**c)**  $m = \sqrt{\frac{hp}{UA}}$   
d) None of these
- 12)** For a perfectly black body \_\_\_\_\_.  
a)  $\alpha = 1, \rho = 0, \tau = 0$                       b)  $\alpha = 0, \rho = 0, \tau = 1$   
c)  $\alpha + \tau = 1, \rho = 0$                          d)  $\alpha = 0, \rho = 1, \tau = 0$
- 13)** The overall heat transfer coefficient is used in case of \_\_\_\_\_.  
a) Conduction                                 b) Convection  
c) Radiation                                      d) Conduction and Convection
- 14)** An increase in convective coefficient over a fin \_\_\_\_\_ effectiveness.  
a) decreases                                      b) increases  
c) does not influence                            d) none of above

Seat No.	
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Set	P
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Heat Transfer**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Draw neat and labeled diagram wherever necessary.  
 4) Figures to the right indicates full marks.  
 5) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

- |    |  |           |
|----|--|-----------|
| a) | Define thermal conductivity. Explain the effect of temperature on thermal conductivity of solid liquids and gases.   | <b>04</b> |
| b) | Derive an expression for critical radius of insulation for cylinder  | <b>05</b> |
| c) | The door of a cold storage plant is made from two 6 mm thick glass sheet separated by a uniform air gap of 2 mm. The temperature of air inside room is $-18^{\circ}\text{C}$ and the ambient air temperature is $35^{\circ}\text{C}$ assuming heat transfer coefficient between glass and air as $23.26 \text{ W/m}^2\text{K}$ determine rate of heat leakage into room per unit area of door. Neglect the convection effect in the air gap and take $K$ for glass as $0.75 \text{ W/mK}$ and $k$ for air as $0.02 \text{ W/mK}$ . | <b>05</b> |

**Q.3 Attempt the following questions.**

- |    |  |           |
|----|--|-----------|
| a) | Explain fin effectiveness and fin efficiency.  | <b>04</b> |
| b) | Derive an expression for steady state one dimensional heat flow through the hollow cylinder without heat generation?   | <b>05</b> |
| c) | A very long 25 mm diameter copper ( $K=380 \text{ W/mK}$ ) rod extends from a surface at $120^{\circ}\text{C}$ . The temperature of surrounding air is $25^{\circ}\text{C}$ and the heat transfer coefficient over the rod is $10 \text{ W/m}^2\text{K}$ . Calculate:<br>1) Heat loss from the rod.<br>2) How long the rod should be in order to be considered infinite? | <b>05</b> |

**Q.4 Attempt the following questions**

- |    |  |           |
|----|--|-----------|
| a) | Explain the following terms:<br>1) Absorptivity<br>2) Reflectivity<br>3) Transmissivity<br>4) Emissivity   | <b>04</b> |
| b) | Explain the concept of shape factor. State the properties of shape factor.   | <b>05</b> |
| c) | A solid steel ball of 5 cm in diameter and initially at $450^{\circ}\text{C}$ is quenched in controlled environment in which the temperature is maintained at $90^{\circ}\text{C}$ with convection coefficient of $115 \text{ W/m}^2\text{K}$ . Determine the time taken by the ball to attain a temperature of $150^{\circ}\text{C}$ .<br>Take following properties for steel<br>$C = 420 \text{ J/kgK}$ , $\rho = 8000 \text{ Kg/m}^3$ , $k = 46 \text{ W/mK}$ | <b>05</b> |

**Section – II**

- Q.5**
- a) Derive an expression for LMTD of counter flow heat exchanger. **05**
  - b) Explain film wise condensation and drop wise condensation. **04**
  - c) In a counter flow heat exchanger water is heated from 25°C to 65°C by an oil of specific heat 1.45KJ/Kg K and mass flow rate of 0.9 Kg/Sec. The oil is cooled from 230°C to 160°C. If the overall heat transfer coefficient is 420 W/m<sup>2</sup>K, Calculate - **05**
    - i) Rate of heat transfer
    - ii) Mass flow rate of water
    - iii) The surface area of heat exchanger
- Q.6**
- a) Using dimensional analysis show that  $Nu=f(Gr,Pr)$  for natural convection. **05**
  - b) A liquid mercury flows at a rate of 1.6 Kg/Sec through a copper tube of 20mm diameter. The mercury enters the tube at 15°C and leaves the at 35°C .Calculate the tube length for constant heat flux at the tube wall which is maintained at an average temperature of 50°C.Use the co-relation as  $Nu=7+0.025(Re.pr)^{0.8}$  **05**

The properties of mercury at 25°C are -  
Density ( $\rho$ )=13582kg/m<sup>3</sup>,  $C_p$ =140J/Kg°C,  
Kinematic viscosity ( $\nu$ )=1.5x10<sup>-7</sup>m<sup>2</sup>/Sec,  $Pr$ =0.0248
  - c) Explain the classification of heat exchanger **04**
- Q.7**
- a) Explain construction, working and Applications of heat pipe. **04**
  - b) Explain with neat sketch boiling curve and its different regimes. **04**
  - c) Derive an expression for effectiveness of a parallel flow heat exchanger. **06**

**Seat  
No.**



- Page 6 of 16

Seat No.	
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Set Q
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Heat Transfer**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
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**Section – I**

**Q.2 Attempt the following questions.**

- |    |  |           |
|----|--|-----------|
| a) | Define thermal conductivity. Explain the effect of temperature on thermal conductivity of solid liquids and gases.   | <b>04</b> |
| b) | Derive an expression for critical radius of insulation for cylinder  | <b>05</b> |
| c) | The door of a cold storage plant is made from two 6 mm thick glass sheet separated by a uniform air gap of 2 mm. The temperature of air inside room is $-18^{\circ}\text{C}$ and the ambient air temperature is $35^{\circ}\text{C}$ assuming heat transfer coefficient between glass and air as $23.26 \text{ W/m}^2\text{K}$ determine rate of heat leakage into room per unit area of door. Neglect the convection effect in the air gap and take $K$ for glass as $0.75 \text{ W/mK}$ and $k$ for air as $0.02 \text{ W/mK}$ . | <b>05</b> |

**Q.3 Attempt the following questions.**

- |    |  |           |
|----|--|-----------|
| a) | Explain fin effectiveness and fin efficiency.  | <b>04</b> |
| b) | Derive an expression for steady state one dimensional heat flow through the hollow cylinder without heat generation?   | <b>05</b> |
| c) | A very long 25 mm diameter copper ( $K=380 \text{ W/mK}$ ) rod extends from a surface at $120^{\circ}\text{C}$ . The temperature of surrounding air is $25^{\circ}\text{C}$ and the heat transfer coefficient over the rod is $10 \text{ W/m}^2\text{K}$ . Calculate:<br>1) Heat loss from the rod.<br>2) How long the rod should be in order to be considered infinite? | <b>05</b> |

**Q.4 Attempt the following questions**

**04**

- |    |  |           |
|----|--|-----------|
| a) | Explain the following terms:<br>1) Absorptivity<br>2) Reflectivity<br>3) Transmissivity<br>4) Emissivity   | <b>04</b> |
| b) | Explain the concept of shape factor. State the properties of shape factor.   | <b>05</b> |
| c) | A solid steel ball of 5 cm in diameter and initially at $450^{\circ}\text{C}$ is quenched in controlled environment in which the temperature is maintained at $90^{\circ}\text{C}$ with convection coefficient of $115 \text{ W/m}^2\text{K}$ . Determine the time taken by the ball to attain a temperature of $150^{\circ}\text{C}$ .<br>Take following properties for steel<br>$C = 420 \text{ J/kgK}$ , $\rho = 8000 \text{ Kg/m}^3$ , $k = 46 \text{ W/mK}$ | <b>05</b> |

**Section – II**

- Q.5**
- a) Derive an expression for LMTD of counter flow heat exchanger. **05**
  - b) Explain film wise condensation and drop wise condensation. **04**
  - c) In a counter flow heat exchanger water is heated from 25°C to 65°C by an oil of specific heat 1.45KJ/Kg K and mass flow rate of 0.9 Kg/Sec. The oil is cooled from 230°C to 160°C. If the overall heat transfer coefficient is 420 W/m<sup>2</sup>K, Calculate - **05**
    - i) Rate of heat transfer
    - ii) Mass flow rate of water
    - iii) The surface area of heat exchanger
- Q.6**
- a) Using dimensional analysis show that  $Nu=f(Gr,Pr)$  for natural convection. **05**
  - b) A liquid mercury flows at a rate of 1.6 Kg/Sec through a copper tube of 20mm diameter. The mercury enters the tube at 15°C and leaves the at 35°C .Calculate the tube length for constant heat flux at the tube wall which is maintained at an average temperature of 50°C.Use the co-relation as  $Nu=7+0.025(Re.pr)^{0.8}$  **05**

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Kinematic viscosity ( $\nu$ )=1.5x10<sup>-7</sup>m<sup>2</sup>/Sec,  $Pr$ =0.0248
  - c) Explain the classification of heat exchanger **04**
- Q.7**
- a) Explain construction, working and Applications of heat pipe. **04**
  - b) Explain with neat sketch boiling curve and its different regimes. **04**
  - c) Derive an expression for effectiveness of a parallel flow heat exchanger. **06**

Seat No.	
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Set	R
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Heat Transfer**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In fins parameter 'm' equals to \_\_\_\_\_.

a) 
$$m = \sqrt{\frac{hp}{KA_{c/s}}}$$

b) 
$$m = \sqrt{\frac{KA_{c/s}}{hp}}$$

c) 
$$m = \sqrt{\frac{hp}{UA}}$$

d) None of these

- 2) For a perfectly black body \_\_\_\_\_.

a)  $\alpha = 1, \rho = 0, \tau = 0$

b)  $\alpha = 0, \rho = 0, \tau = 1$

c)  $\alpha + \tau = 1, \rho = 0$

d)  $\alpha = 0, \rho = 1, \tau = 0$

- 3) The overall heat transfer coefficient is used in case of \_\_\_\_\_.

a) Conduction

b) Convection

c) Radiation

d) Conduction and Convection

- 4) An increase in convective coefficient over a fin \_\_\_\_\_ effectiveness.

a) decreases

b) increases

c) does not influence

d) none of above

- 5) Thermal conductivity of solid metals \_\_\_\_\_ with rise in temperature.

a) decreases

b) increases

c) remains same

d) unpredictable

- 6) Thermal diffusivity of a substance is \_\_\_\_\_.

a) directly proportional to the thermal conductivity

b) inversely proportional to the density of substance

c) inversely proportional to specific heat

d) all above



Seat No.	
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Set R
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Heat Transfer**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
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**Section – I**

**Q.2 Attempt the following questions.**

- |    |  |           |
|----|--|-----------|
| a) | Define thermal conductivity. Explain the effect of temperature on thermal conductivity of solid liquids and gases.   | <b>04</b> |
| b) | Derive an expression for critical radius of insulation for cylinder  | <b>05</b> |
| c) | The door of a cold storage plant is made from two 6 mm thick glass sheet separated by a uniform air gap of 2 mm. The temperature of air inside room is $-18^{\circ}\text{C}$ and the ambient air temperature is $35^{\circ}\text{C}$ assuming heat transfer coefficient between glass and air as $23.26 \text{ W/m}^2\text{K}$ determine rate of heat leakage into room per unit area of door. Neglect the convection effect in the air gap and take $K$ for glass as $0.75 \text{ W/mK}$ and $k$ for air as $0.02 \text{ W/mK}$ . | <b>05</b> |

**Q.3 Attempt the following questions.**

- |    |  |           |
|----|--|-----------|
| a) | Explain fin effectiveness and fin efficiency.  | <b>04</b> |
| b) | Derive an expression for steady state one dimensional heat flow through the hollow cylinder without heat generation?   | <b>05</b> |
| c) | A very long 25 mm diameter copper ( $K=380 \text{ W/mK}$ ) rod extends from a surface at $120^{\circ}\text{C}$ . The temperature of surrounding air is $25^{\circ}\text{C}$ and the heat transfer coefficient over the rod is $10 \text{ W/m}^2\text{K}$ . Calculate:<br>1) Heat loss from the rod.<br>2) How long the rod should be in order to be considered infinite? | <b>05</b> |

**Q.4 Attempt the following questions**

**04**

- |    |  |           |
|----|--|-----------|
| a) | Explain the following terms:<br>1) Absorptivity<br>2) Reflectivity<br>3) Transmissivity<br>4) Emissivity   | <b>04</b> |
| b) | Explain the concept of shape factor. State the properties of shape factor.   | <b>05</b> |
| c) | A solid steel ball of 5 cm in diameter and initially at $450^{\circ}\text{C}$ is quenched in controlled environment in which the temperature is maintained at $90^{\circ}\text{C}$ with convection coefficient of $115 \text{ W/m}^2\text{K}$ . Determine the time taken by the ball to attain a temperature of $150^{\circ}\text{C}$ .<br>Take following properties for steel<br>$C = 420 \text{ J/kgK}$ , $\rho = 8000 \text{ Kg/m}^3$ , $k = 46 \text{ W/mK}$ | <b>05</b> |

**Section – II**

- Q.5**
- a) Derive an expression for LMTD of counter flow heat exchanger. **05**
  - b) Explain film wise condensation and drop wise condensation. **04**
  - c) In a counter flow heat exchanger water is heated from 25°C to 65°C by an oil of specific heat 1.45KJ/Kg K and mass flow rate of 0.9 Kg/Sec. The oil is cooled from 230°C to 160°C. If the overall heat transfer coefficient is 420 W/m<sup>2</sup>K, Calculate - **05**
    - i) Rate of heat transfer
    - ii) Mass flow rate of water
    - iii) The surface area of heat exchanger
- Q.6**
- a) Using dimensional analysis show that  $Nu=f(Gr,Pr)$  for natural convection. **05**
  - b) A liquid mercury flows at a rate of 1.6 Kg/Sec through a copper tube of 20mm diameter. The mercury enters the tube at 15°C and leaves the at 35°C .Calculate the tube length for constant heat flux at the tube wall which is maintained at an average temperature of 50°C.Use the co-relation as  $Nu=7+0.025(Re.Pr)^{0.8}$  **05**

The properties of mercury at 25°C are -  
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  - c) Explain the classification of heat exchanger **04**
- Q.7**
- a) Explain construction, working and Applications of heat pipe. **04**
  - b) Explain with neat sketch boiling curve and its different regimes. **04**
  - c) Derive an expression for effectiveness of a parallel flow heat exchanger. **06**





- 7) For a perfectly black body \_\_\_\_\_.  
a)  $\alpha = 1, \rho = 0, \tau = 0$                       b)  $\alpha = 0, \rho = 0, \tau = 1$   
c)  $\alpha + \tau = 1, \rho = 0$                       d)  $\alpha = 0, \rho = 1, \tau = 0$
- 8) The overall heat transfer coefficient is used in case of \_\_\_\_\_.  
a) Conduction                                      b) Convection  
c) Radiation                                        d) Conduction and Convection
- 9) An increase in convective coefficient over a fin \_\_\_\_\_ effectiveness.  
a) decreases                                        b) increases  
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a) directly proportional to the thermal conductivity  
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- 12) Which one of the dimensionless number has significant role in natural convection?  
a) Stanton    b) Grashoff  
c) Reynolds                                         d) Nusselt
- 13) The radiation shape factor between two parallel plates is \_\_\_\_\_.  
a) 1    b) 0  
c) 0.5    d) 0.33
- 14) Up to the critical radius of insulation \_\_\_\_\_.  
a) Heat loss decreases with addition of insulation  
b) Heat loss increases with addition of insulation  
c) Heat loss remains constant  
d) There occurs a decrease in heat flux

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Heat Transfer**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each Section.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Draw neat and labeled diagram wherever necessary.  
 4) Figures to the right indicates full marks.  
 5) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Attempt the following questions.**

- |    |  |           |
|----|--|-----------|
| a) | Define thermal conductivity. Explain the effect of temperature on thermal conductivity of solid liquids and gases.   | <b>04</b> |
| b) | Derive an expression for critical radius of insulation for cylinder  | <b>05</b> |
| c) | The door of a cold storage plant is made from two 6 mm thick glass sheet separated by a uniform air gap of 2 mm. The temperature of air inside room is $-18^{\circ}\text{C}$ and the ambient air temperature is $35^{\circ}\text{C}$ assuming heat transfer coefficient between glass and air as $23.26 \text{ W/m}^2\text{K}$ determine rate of heat leakage into room per unit area of door. Neglect the convection effect in the air gap and take $K$ for glass as $0.75 \text{ W/mK}$ and $k$ for air as $0.02 \text{ W/mK}$ . | <b>05</b> |

**Q.3 Attempt the following questions.**

- |    |  |           |
|----|--|-----------|
| a) | Explain fin effectiveness and fin efficiency.  | <b>04</b> |
| b) | Derive an expression for steady state one dimensional heat flow through the hollow cylinder without heat generation?   | <b>05</b> |
| c) | A very long 25 mm diameter copper ( $K=380 \text{ W/mK}$ ) rod extends from a surface at $120^{\circ}\text{C}$ . The temperature of surrounding air is $25^{\circ}\text{C}$ and the heat transfer coefficient over the rod is $10 \text{ W/m}^2\text{K}$ . Calculate:<br>1) Heat loss from the rod.<br>2) How long the rod should be in order to be considered infinite? | <b>05</b> |

**Q.4 Attempt the following questions**

- |    |  |           |
|----|--|-----------|
| a) | Explain the following terms:<br>1) Absorptivity<br>2) Reflectivity<br>3) Transmissivity<br>4) Emissivity   | <b>04</b> |
| b) | Explain the concept of shape factor. State the properties of shape factor.   | <b>05</b> |
| c) | A solid steel ball of 5 cm in diameter and initially at $450^{\circ}\text{C}$ is quenched in controlled environment in which the temperature is maintained at $90^{\circ}\text{C}$ with convection coefficient of $115 \text{ W/m}^2\text{K}$ . Determine the time taken by the ball to attain a temperature of $150^{\circ}\text{C}$ .<br>Take following properties for steel<br>$C = 420 \text{ J/kgK}$ , $\rho = 8000 \text{ Kg/m}^3$ , $k = 46 \text{ W/mK}$ | <b>05</b> |

**Section – II**

- Q.5**
- a) Derive an expression for LMTD of counter flow heat exchanger. **05**
  - b) Explain film wise condensation and drop wise condensation. **04**
  - c) In a counter flow heat exchanger water is heated from 25°C to 65°C by an oil of specific heat 1.45KJ/Kg K and mass flow rate of 0.9 Kg/Sec. The oil is cooled from 230°C to 160°C. If the overall heat transfer coefficient is 420 W/m<sup>2</sup>K, Calculate - **05**
    - i) Rate of heat transfer
    - ii) Mass flow rate of water
    - iii) The surface area of heat exchanger
- Q.6**
- a) Using dimensional analysis show that  $Nu=f(Gr,Pr)$  for natural convection. **05**
  - b) A liquid mercury flows at a rate of 1.6 Kg/Sec through a copper tube of 20mm diameter. The mercury enters the tube at 15°C and leaves the at 35°C .Calculate the tube length for constant heat flux at the tube wall which is maintained at an average temperature of 50°C.Use the co-relation as  $Nu=7+0.025(Re.pr)^{0.8}$  **05**

The properties of mercury at 25°C are -  
Density ( $\rho$ )=13582kg/m<sup>3</sup>,  $C_p$ =140J/Kg°C,  
Kinematic viscosity ( $\nu$ )=1.5x10<sup>-7</sup>m<sup>2</sup>/Sec,  $Pr$ =0.0248
  - c) Explain the classification of heat exchanger **04**
- Q.7**
- a) Explain construction, working and Applications of heat pipe. **04**
  - b) Explain with neat sketch boiling curve and its different regimes. **04**
  - c) Derive an expression for effectiveness of a parallel flow heat exchanger. **06**

<b>Seat No.</b>	
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Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 14

1) \_\_\_\_\_ is defined as “the discipline dealing with what is good and bad & with moral duty & obligation”.

- Page 1 of 16

- 9) Cost associated with defective products being shipped to the customers are called as \_\_\_\_\_.  
a) Cost of internal failure                      b) Cost of external failure  
c) Rejection cost                                  d) Total cost of failure
- 10) The quality of design is concerned with the \_\_\_\_\_ for the manufacture of the product.  
a) exactness of specification                  b) fitness of specification  
c) correctness of specification              d) tightness of specification
- 11) In double sampling plan 'C2' is the acceptance number for the \_\_\_\_\_.  
a) First and last combined  
b) First and second sample combined  
c) Last two combined  
d) First three combined
- 12) The producers risk is denoted by \_\_\_\_\_.  
a)  $\rho$     b)  $\beta$   
c)  $\alpha$     d)  $\delta$
- 13) AOQ is given by the relation \_\_\_\_\_.  
a)  $P' \cdot Pa (N - n / N)$                               b)  $Pa \cdot P' (N - n / n)$   
c)  $Pa \cdot P' (n - N / n)$                               d)  $Pa \cdot P' (N + n / N)$
- 14) LTPD stands for  
a) Lot Tolerance Perfect Defective  
b) Lot Tolerance Percent Defective  
c) Lot Tolerable Percent Defective  
d) Lot Tolerance Piece Defective

<b>Seat No.</b>	
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial & Quality Management**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section – I.  
 2) Solve any two questions from Section – II.  
 3) Figures to the right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is system approach to the management?                                 | <b>05</b> |
|            | <b>b)</b> Write difference between narrow span and wide span.                        | <b>05</b> |
|            | <b>c)</b> Explain Maslow's motivational theory.                                      | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Describe steps in planning process.  | <b>05</b> |
|            | <b>b)</b> Discuss selection process in detail.                                       | <b>05</b> |
|            | <b>c)</b> What are channels of distribution of Industrial goods and consumers goods? | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain leadership behavior in detail.                                     | <b>05</b> |
|            | <b>b)</b> Elaborate types of finance and sources of finance.                         | <b>05</b> |
|            | <b>c)</b> What are reasons for weak delegation of authority?                         | <b>04</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain Pareto analysis & cause effect diagram.   | <b>05</b> |
|            | <b>b)</b> Write note on supplier partnership.   | <b>05</b> |
|            | <b>c)</b> What is quality of design? Explain factors affecting it.  | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Write note on benchmarking.   | <b>04</b> |
|            | <b>b)</b> A manufacturer purchases small bolts in cartons that usually contains several thousands of bolts. Each shipment consists of a number of cartons. As a part of acceptance procedure for these bolts, 400 bolts are selected at random from each carton & are subjected to visual inspection for certain defect. In shipment of 10 cartons the respective percentage of defectives in the samples from each carton are 0, 0, 0.5, 0.75, 0, 2.0, 0.25, 0, 0.25 & 1.25. Does this shipment of bolts appear to exhibit statistical control with respect to the quality characteristics examined in the inspection? | <b>06</b> |
|            | <b>c)</b> Write note on any two Quality gurus.  | <b>04</b> |

- Q.7**
- a)** Write short note on six sigma. **04**
  - b)** A double sampling plan is as follows: **06**
    - 1) Select a sample of 2 from a lot of 20. If both article inspected bare good, accept the lot, if both are defective, reject the lot. If 1 is good & 1 defective, take the second sample of one article.
    - 2) If the article in the second sample is good, accept the lot. If it is defective reject the lot. If a lot of 25% defective is submitted, what is the probability of acceptance? Compute this by the method i.e. theoretically correct rather than an approximate method
  - c)** Explain cost of internal failures and cost of external failures. **04**

Seat No.	
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Set Q
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial & Quality Management**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ is the routes taken by the product/goods as they move from the organization/producer to the ultimate consumer or user.
  - a) Routing
  - b) Channel of distribution
  - c) Path
  - d) Delivery
- 2) Cost associated with defective products being shipped to the customers are called as \_\_\_\_\_.
  - a) Cost of internal failure
  - b) Cost of external failure
  - c) Rejection cost
  - d) Total cost of failure
- 3) The quality of design is concerned with the \_\_\_\_\_ for the manufacture of the product.
  - a) exactness of specification
  - b) fitness of specification
  - c) correctness of specification
  - d) tightness of specification
- 4) In double sampling plan 'C2' is the acceptance number for the \_\_\_\_\_.
  - a) First and last combined
  - b) First and second sample combined
  - c) Last two combined
  - d) First three combined
- 5) The producers risk is denoted by \_\_\_\_\_.
  - a)  $\rho$
  - b)  $\beta$
  - c)  $\alpha$
  - d)  $\delta$
- 6) AOQ is given by the relation \_\_\_\_\_.
  - a)  $P' \cdot Pa (N - n / N)$
  - b)  $Pa \cdot P' (N - n / n)$
  - c)  $Pa \cdot P' (n - N / n)$
  - d)  $Pa \cdot P' (N + n / N)$
- 7) LTPD stands for
  - a) Lot Tolerance Perfect Defective
  - b) Lot Tolerance Percent Defective
  - c) Lot Tolerable Percent Defective
  - d) Lot Tolerance Piece Defective



- 8) \_\_\_\_\_ is defined as “the discipline dealing with what is good and bad & with moral duty & obligation”.
- a) Rule
  - b) Organisation culture
  - c) Protocol
  - d) Ethics
- 9) \_\_\_\_\_ are the ends towards which the activity is aimed.
- a) purpose
  - b) mission
  - c) objectives
  - d) programs
- 10) Close control, close supervision is advantage of \_\_\_\_\_.
- a) Narrow Span
  - b) Wide Span
  - c) Close Span
  - d) Open Span
- 11) If \_\_\_\_\_ then this could results in frustration of subordinates.
- a) Power > Responsibility
  - b) Power < Responsibility
  - c) Power = Responsibility
  - d) Power > Authority
- 12) \_\_\_\_\_ leader's uses his or her power very little, if at all, giving subordinates a high degree of independence in their operations.
- a) Autocratic
  - b) Democratic
  - c) The free rein
  - d) Ideal
- 13) Theory \_\_\_\_\_ is optimistic, dynamic, flexible.
- a) X
  - b) Z
  - c) Y
  - d) Positive
- 14) The financial needs which required up to \_\_\_\_\_ are treated as short term funds.
- a) Seven months
  - b) One year
  - c) Two years
  - d) three years

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial & Quality Management**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section – I.  
 2) Solve any two questions from Section – II.  
 3) Figures to the right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is system approach to the management?                                 | <b>05</b> |
|            | <b>b)</b> Write difference between narrow span and wide span.                        | <b>05</b> |
|            | <b>c)</b> Explain Maslow's motivational theory.                                      | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Describe steps in planning process.  | <b>05</b> |
|            | <b>b)</b> Discuss selection process in detail.                                       | <b>05</b> |
|            | <b>c)</b> What are channels of distribution of Industrial goods and consumers goods? | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain leadership behavior in detail.                                     | <b>05</b> |
|            | <b>b)</b> Elaborate types of finance and sources of finance.                         | <b>05</b> |
|            | <b>c)</b> What are reasons for weak delegation of authority?                         | <b>04</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain Pareto analysis & cause effect diagram.   | <b>05</b> |
|            | <b>b)</b> Write note on supplier partnership.   | <b>05</b> |
|            | <b>c)</b> What is quality of design? Explain factors affecting it.  | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Write note on benchmarking.   | <b>04</b> |
|            | <b>b)</b> A manufacturer purchases small bolts in cartons that usually contains several thousands of bolts. Each shipment consists of a number of cartons. As a part of acceptance procedure for these bolts, 400 bolts are selected at random from each carton & are subjected to visual inspection for certain defect. In shipment of 10 cartons the respective percentage of defectives in the samples from each carton are 0, 0, 0.5, 0.75, 0, 2.0, 0.25, 0, 0.25 & 1.25. Does this shipment of bolts appear to exhibit statistical control with respect to the quality characteristics examined in the inspection? | <b>06</b> |
|            | <b>c)</b> Write note on any two Quality gurus.  | <b>04</b> |

- Q.7**
- a)** Write short note on six sigma. **04**
  - b)** A double sampling plan is as follows: **06**
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  - c)** Explain cost of internal failures and cost of external failures. **04**

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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial & Quality Management**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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- 1) In double sampling plan 'C2' is the acceptance number for the \_\_\_\_\_.  
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 a) Rule  
 b) Organisation culture  
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- 6) \_\_\_\_\_ are the ends towards which the activity is aimed.  
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- a) exactness of specification
  - b) fitness of specification
  - c) correctness of specification
  - d) tightness of specification

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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial & Quality Management**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section – I.  
 2) Solve any two questions from Section – II.  
 3) Figures to the right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is system approach to the management?                                 | <b>05</b> |
|            | <b>b)</b> Write difference between narrow span and wide span.                        | <b>05</b> |
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| <b>Q.3</b> | <b>a)</b> Describe steps in planning process.  | <b>05</b> |
|            | <b>b)</b> Discuss selection process in detail.                                       | <b>05</b> |
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| <b>Q.4</b> | <b>a)</b> Explain leadership behavior in detail.                                     | <b>05</b> |
|            | <b>b)</b> Elaborate types of finance and sources of finance.                         | <b>05</b> |
|            | <b>c)</b> What are reasons for weak delegation of authority?                         | <b>04</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain Pareto analysis & cause effect diagram.   | <b>05</b> |
|            | <b>b)</b> Write note on supplier partnership.   | <b>05</b> |
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- Q.7**
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  - c)** Explain cost of internal failures and cost of external failures. **04**

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## Max. Marks: 70

Marks: 14

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- 9) LTPD stands for  
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- 14) \_\_\_\_\_ leader's uses his or her power very little, if at all, giving subordinates a high degree of independence in their operations.  
a) Autocratic  
b) Democratic  
c) The free rein  
d) Ideal

<b>Seat No.</b>	
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial & Quality Management**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from Section – I.  
 2) Solve any two questions from Section – II.  
 3) Figures to the right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is system approach to the management?                                 | <b>05</b> |
|            | <b>b)</b> Write difference between narrow span and wide span.                        | <b>05</b> |
|            | <b>c)</b> Explain Maslow's motivational theory.                                      | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Describe steps in planning process.  | <b>05</b> |
|            | <b>b)</b> Discuss selection process in detail.                                       | <b>05</b> |
|            | <b>c)</b> What are channels of distribution of Industrial goods and consumers goods? | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain leadership behavior in detail.                                     | <b>05</b> |
|            | <b>b)</b> Elaborate types of finance and sources of finance.                         | <b>05</b> |
|            | <b>c)</b> What are reasons for weak delegation of authority?                         | <b>04</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain Pareto analysis & cause effect diagram.   | <b>05</b> |
|            | <b>b)</b> Write note on supplier partnership.   | <b>05</b> |
|            | <b>c)</b> What is quality of design? Explain factors affecting it.  | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Write note on benchmarking.   | <b>04</b> |
|            | <b>b)</b> A manufacturer purchases small bolts in cartons that usually contains several thousands of bolts. Each shipment consists of a number of cartons. As a part of acceptance procedure for these bolts, 400 bolts are selected at random from each carton & are subjected to visual inspection for certain defect. In shipment of 10 cartons the respective percentage of defectives in the samples from each carton are 0, 0, 0.5, 0.75, 0, 2.0, 0.25, 0, 0.25 & 1.25. Does this shipment of bolts appear to exhibit statistical control with respect to the quality characteristics examined in the inspection? | <b>06</b> |
|            | <b>c)</b> Write note on any two Quality gurus.  | <b>04</b> |

- Q.7**
- a)** Write short note on six sigma. **04**
  - b)** A double sampling plan is as follows: **06**
    - 1) Select a sample of 2 from a lot of 20. If both article inspected bare good, accept the lot, if both are defective, reject the lot. If 1 is good & 1 defective, take the second sample of one article.
    - 2) If the article in the second sample is good, accept the lot. If it is defective reject the lot. If a lot of 25% defective is submitted, what is the probability of acceptance? Compute this by the method i.e. theoretically correct rather than an approximate method
  - c)** Explain cost of internal failures and cost of external failures. **04**

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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Project Management**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative**

**14**

- 1) Which of the following is not needed to generate a schedule performance index (SPI)?
 

a) Earned value	b) Actual cost
c) Planned value	d) Basis of estimate
- 2) Cost variance is computed by \_\_\_\_\_.
 

a) Subtracting planned value from actual cost
b) Subtracting actual cost from earned value
c) Subtracting budget at completion from earned value
d) Subtracting BAC from ETC
- 3) Critical path is \_\_\_\_\_.
 

a) Minimum time required to complete the project
b) ETC
c) normal path on the project
d) None of the above
- 4) Project is a \_\_\_\_\_ endeavour.
 

a) Perpetual	b) Permanent
c) Temporary	d) None of the above
- 5) Your project is experiencing resource constraints at certain times in the project timeline, requiring you to adjust start and finish dates on the schedule. What tool is best to use in this situation?
 

a) Resource levelling	b) Feeding buffer
c) Critical Path method	d) Resource smoothing
- 6) You are three months into a six month project. Assume the budget burn rate is constant. The budget at completion (BAC) is \$120,000. AC = \$65,000. The SPT = 1.2. What is the CPI of this project? (Round to 2 decimal places)?
 

a) 1.25
b) 1.25
c) 1.11
d) It cannot be determined from the information given

- 7) Criterion weights to rank the projects within each category is a part of \_\_\_\_\_.  
a) Prioritise the Projects  
b) Reduce the Criteria Set  
c) Projects held in Reserve  
d) Assembling
- 8) Project Management, the end users and developers require to know the \_\_\_\_\_.  
a) cost of the project  
b) duration  
c) Length  
d) All the above
- 9) The methods and regulation used to define goals, plan and monitor tasks and resources, identify and resolve issues, and control costs and budgets for specific project is known as \_\_\_\_\_.  
a) Project management  
b) Process Management  
c) Process  
d) Activities
- 10) Which of the following is not considered as a risk in project management?  
a) Specification delays  
b) Product competition  
c) Testing  
d) Staff turnover
- 11) From the following calculate critical Path Duration in days  
Activity: 1-2 2-3 2-4 3-5 4-6 5-6  
Duration: 3 4 3 3 2 2  
a) 13 days  
b) 8 days  
c) 11 days  
d) 12 days
- 12) The three phases involved in the management of large projects are  
a) scheduling, operating, evaluating.  
b) scheduling, designing, operating.  
c) planning, scheduling, evaluating.  
d) planning, scheduling, controlling.
- 13) There is a need of dummy activity when  
a) network contains two or more activities having identical starting and ending events.  
b) the network contains two or more activities that have the same starting events.  
c) the network contains two or more activities that have different ending events.  
d) the network contains two or more activities that have the same ending events.
- 14) The probability of completing the project can be estimated based upon the \_\_\_\_\_.  
a) Uniform distribution curve  
b) Exponential distribution curve  
c) U-shaped distribution curve  
d) Normal distribution curve

Seat No.	
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Project Management**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2**    a) Explain Project Management Process in detail **07**  
           b) What is risk management? Explain steps in risk management. **07**
- Q.3**    a) Explain role of Project Manager. **07**  
           b) Explain break even analysis with its importance in project management. **07**
- Q.4**    **Write a short note on: (Any 2) (2X7)** **14**  
           a) Monte Carlo Simulation  
           b) Cost Estimating Methods  
           c) Project Lifecycle

**Section – II**

- Q.5**    a) Explain Purpose of Project Execution and Control. **07**  
           b) Explain various features in the MS Project in detail. **07**
- Q.6**    a) What is Project Controlling? Explain various steps in Project Control Process. **07**  
           b) Explain importance of Project Performance measurement. Explain benefits and challenges of Performance Measurement and Evaluation. **07**
- Q.7**    **Write a short note on: (Any 2) (2x7)** **14**  
           a) Earned Value Analysis/Method (EVA/EVM)  
           b) WBS  
           c) Project Management Information System (PMIS)

<b>Seat No.</b>	
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Max. Marks: 70

Marks: 14

## 14

- Page 4 of 12

- 7) The probability of completing the project can be estimated based upon the \_\_\_\_\_.  
a) Uniform distribution curve  
b) Exponential distribution curve  
c) U-shaped distribution curve  
d) Normal distribution curve
- 8) Which of the following is not needed to generate a schedule performance index (SPI)?  
a) Earned value  
b) Actual cost  
c) Planned value  
d) Basis of estimate
- 9) Cost variance is computed by \_\_\_\_\_.  
a) Subtracting planned value from actual cost  
b) Subtracting actual cost from earned value  
c) Subtracting budget at completion from earned value  
d) Subtracting BAC from ETC
- 10) Critical path is \_\_\_\_\_.  
a) Minimum time required to complete the project  
b) ETC  
c) normal path on the project  
d) None of the above
- 11) Project is a \_\_\_\_\_ endeavour.  
a) Perpetual  
b) Permanent  
c) Temporary  
d) None of the above
- 12) Your project is experiencing resource constraints at certain times in the project timeline, requiring you to adjust start and finish dates on the schedule. What tool is best to use in this situation?  
a) Resource levelling  
b) Feeding buffer  
c) Critical Path method  
d) Resource smoothing
- 13) You are three months into a six month project. Assume the budget burn rate is constant. The budget at completion (BAC) is \$120,000. AC = \$65,000. The SPT = 1.2. What is the CPI of this project? (Round to 2 decimal places)?  
a) 1.25  
b) 1.25  
c) 1.11  
d) It cannot be determined from the information given
- 14) Criterion weights to rank the projects within each category is a part of \_\_\_\_\_.  
a) Prioritise the Projects  
b) Reduce the Criteria Set  
c) Projects held in Reserve  
d) Assembling



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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Project Management**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2**    a) Explain Project Management Process in detail **07**  
           b) What is risk management? Explain steps in risk management. **07**
- Q.3**    a) Explain role of Project Manager. **07**  
           b) Explain break even analysis with its importance in project management. **07**
- Q.4**    **Write a short note on: (Any 2) (2X7)** **14**  
           a) Monte Carlo Simulation  
           b) Cost Estimating Methods  
           c) Project Lifecycle

**Section – II**

- Q.5**    a) Explain Purpose of Project Execution and Control. **07**  
           b) Explain various features in the MS Project in detail. **07**
- Q.6**    a) What is Project Controlling? Explain various steps in Project Control Process. **07**  
           b) Explain importance of Project Performance measurement. Explain benefits and challenges of Performance Measurement and Evaluation. **07**
- Q.7**    **Write a short note on: (Any 2) (2x7)** **14**  
           a) Earned Value Analysis/Method (EVA/EVM)  
           b) WBS  
           c) Project Management Information System (PMIS)

<b>Seat No.</b>	
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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 14

## 14

- Page 7 of 12

- 6) Cost variance is computed by \_\_\_\_\_.  
a) Subtracting planned value from actual cost  
b) Subtracting actual cost from earned value  
c) Subtracting budget at completion from earned value  
d) Subtracting BAC from ETC
- 7) Critical path is \_\_\_\_\_.  
a) Minimum time required to complete the project  
b) ETC  
c) normal path on the project  
d) None of the above
- 8) Project is a \_\_\_\_\_ endeavour.  
a) Perpetual  
b) Permanent  
c) Temporary  
d) None of the above
- 9) Your project is experiencing resource constraints at certain times in the project timeline, requiring you to adjust start and finish dates on the schedule. What tool is best to use in this situation?  
a) Resource levelling  
b) Feeding buffer  
c) Critical Path method  
d) Resource smoothing
- 10) You are three months into a six month project. Assume the budget burn rate is constant. The budget at completion (BAC) is \$120,000. AC = \$65,000. The SPT = 1.2. What is the CPI of this project? (Round to 2 decimal places)?  
a) 1.25  
b) 1.25  
c) 1.11  
d) It cannot be determined from the information given
- 11) Criterion weights to rank the projects within each category is a part of \_\_\_\_\_.  
a) Prioritise the Projects  
b) Reduce the Criteria Set  
c) Projects held in Reserve  
d) Assembling
- 12) Project Management, the end users and developers require to know the \_\_\_\_\_.  
a) cost of the project  
b) duration  
c) Length  
d) All the above
- 13) The methods and regulation used to define goals, plan and monitor tasks and resources, identify and resolve issues, and control costs and budgets for specific project is known as \_\_\_\_\_.  
a) Project management  
b) Process Management  
c) Process  
d) Activities
- 14) Which of the following is not considered as a risk in project management?  
a) Specification delays  
b) Product competition  
c) Testing  
d) Staff turnover

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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Project Management**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2**    a) Explain Project Management Process in detail **07**  
           b) What is risk management? Explain steps in risk management. **07**
- Q.3**    a) Explain role of Project Manager. **07**  
           b) Explain break even analysis with its importance in project management. **07**
- Q.4**    **Write a short note on: (Any 2) (2X7)** **14**  
           a) Monte Carlo Simulation  
           b) Cost Estimating Methods  
           c) Project Lifecycle

**Section – II**

- Q.5**    a) Explain Purpose of Project Execution and Control. **07**  
           b) Explain various features in the MS Project in detail. **07**
- Q.6**    a) What is Project Controlling? Explain various steps in Project Control Process. **07**  
           b) Explain importance of Project Performance measurement. Explain benefits and challenges of Performance Measurement and Evaluation. **07**
- Q.7**    **Write a short note on: (Any 2) (2x7)** **14**  
           a) Earned Value Analysis/Method (EVA/EVM)  
           b) WBS  
           c) Project Management Information System (PMIS)

Seat No.	
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Project Management**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative**

**14**

- 1) You are three months into a six month project. Assume the budget burn rate is constant. The budget at completion (BAC) is \$120,000. AC = \$65,000. The SPT = 1.2. What is the CPI of this project? (Round to 2 decimal places)?
  - a) 1.25
  - b) 1.25
  - c) 1.11
  - d) It cannot be determined from the information given
- 2) Criterion weights to rank the projects within each category is a part of \_\_\_\_\_.
  - a) Prioritise the Projects
  - b) Reduce the Criteria Set
  - c) Projects held in Reserve
  - d) Assembling
- 3) Project Management, the end users and developers require to know the \_\_\_\_\_.
  - a) cost of the project
  - b) duration
  - c) Length
  - d) All the above
- 4) The methods and regulation used to define goals, plan and monitor tasks and resources, identify and resolve issues, and control costs and budgets for specific project is known as \_\_\_\_\_.
  - a) Project management
  - b) Process Management
  - c) Process
  - d) Activities
- 5) Which of the following is not considered as a risk in project management?
  - a) Specification delays
  - b) Product competition
  - c) Testing
  - d) Staff turnover
- 6) From the following calculate critical Path Duration in days  
 Activity: 1-2 2-3 2-4 3-5 4-6 5-6  
 Duration: 3 4 3 3 2 2
  - a) 13 days
  - b) 8 days
  - c) 11 days
  - d) 12 days

- 7) The three phases involved in the management of large projects are
- scheduling, operating, evaluating.
  - scheduling, designing, operating.
  - planning, scheduling, evaluating.
  - planning, scheduling, controlling.
- 8) There is a need of dummy activity when
- network contains two or more activities having identical starting and ending events.
  - the network contains two or more activities that have the same starting events.
  - the network contains two or more activities that have different ending events.
  - the network contains two or more activities that have the same ending events.
- 9) The probability of completing the project can be estimated based upon the \_\_\_\_.
- Uniform distribution curve
  - Exponential distribution curve
  - U-shaped distribution curve
  - Normal distribution curve
- 10) Which of the following is not needed to generate a schedule performance index (SPI)?
- |                  |                      |
|------------------|----------------------|
| a) Earned value  | b) Actual cost       |
| c) Planned value | d) Basis of estimate |
- 11) Cost variance is computed by \_\_\_\_
- Subtracting planned value from actual cost
  - Subtracting actual cost from earned value
  - Subtracting budget at completion from earned value
  - Subtracting BAC from ETC
- 12) Critical path is \_\_\_\_.
- Minimum time required to complete the project
  - ETC
  - normal path on the project
  - None of the above
- 13) Project is a \_\_\_\_ endeavour.
- |              |                      |
|--------------|----------------------|
| a) Perpetual | b) Permanent         |
| c) Temporary | d) None of the above |
- 14) Your project is experiencing resource constraints at certain times in the project timeline, requiring you to adjust start and finish dates on the schedule. What tool is best to use in this situation?
- |                         |                       |
|-------------------------|-----------------------|
| a) Resource levelling   | b) Feeding buffer     |
| c) Critical Path method | d) Resource smoothing |

Seat No.	
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Project Management**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2**    a) Explain Project Management Process in detail **07**  
           b) What is risk management? Explain steps in risk management. **07**
- Q.3**    a) Explain role of Project Manager. **07**  
           b) Explain break even analysis with its importance in project management. **07**
- Q.4**    **Write a short note on: (Any 2) (2X7)** **14**  
           a) Monte Carlo Simulation  
           b) Cost Estimating Methods  
           c) Project Lifecycle

**Section – II**

- Q.5**    a) Explain Purpose of Project Execution and Control. **07**  
           b) Explain various features in the MS Project in detail. **07**
- Q.6**    a) What is Project Controlling? Explain various steps in Project Control Process. **07**  
           b) Explain importance of Project Performance measurement. Explain benefits and challenges of Performance Measurement and Evaluation. **07**
- Q.7**    **Write a short note on: (Any 2) (2x7)** **14**  
           a) Earned Value Analysis/Method (EVA/EVM)  
           b) WBS  
           c) Project Management Information System (PMIS)

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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Product Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options** **14**

- 1) The following aspect of product is concerned with the ease and efficiency of the product performance
 

a) Functional aspect	b) Operational aspect
c) Durability aspect	d) Aesthetic aspect
- 2) The appearance of a product is the total visual effect produced by structure, form, material, dimensions and colour.
 

a) True	b) False
---------	----------
- 3) Tactile and visual are the types of \_\_\_\_\_.
 

a) Texture	b) Form
c) Shape	d) Colour
- 4) Cost estimation, and thereby profitability, also is necessary for determining the economic advantage of the business.
 

a) True	b) False
---------	----------
- 5) One of the most difficult aspects of product development is recognizing, understanding, and managing \_\_\_\_\_.
 

a) Trade-offs	b) Dynamics
c) Details	d) Economics
- 6) The \_\_\_\_\_ function plays the lead role in defining the physical form of the product to best meet customer needs.
 

a) Design	b) Manufacturing
c) Marketing	d) None of the above
- 7) The collection of individuals developing a product forms the \_\_\_\_\_.
 

a) Supply team	b) Project team
c) Marketing team	d) None of the above
- 8) The necessity to know the environment in which the product will be used is termed as \_\_\_\_\_.
 

a) Design Situation	b) Design Analysis
c) Aesthetics	d) Ergonomics



- 9) In six hats techniques, Red hat stands for \_\_\_\_\_.
  - a) Emotions
  - b) Optimism
  - c) New Ideas
  - d) Information
- 10) The design for environment is essentially due to \_\_\_\_\_.
  - a) Customer Demand
  - b) Government Laws
  - c) ISO Requirement
  - d) All of the above
- 11) \_\_\_\_\_ is more detailed and physical.
  - a) Lateral thinking
  - b) Vertical thinking
  - c) Creative thinking
  - d) None of the above
- 12) Fear of \_\_\_\_\_ blocks creativity.
  - a) Making Mistakes
  - b) Being Criticized
  - c) Being Alone
  - d) All of the above
- 13) \_\_\_\_\_ helps in establishing the interchangeability of products.
  - a) Standardization
  - b) Simplification
  - c) Diversification
  - d) Specialization
- 14) \_\_\_\_\_ is a three-dimensional area enclosed by a surface.
  - a) Form
  - b) Shape
  - c) Line
  - d) None of the above

Seat No.	
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Set	P
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Product Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each Section.  
 2) Figures to the right indicates full marks.  
 3) Make suitable assumption if necessary and state it clearly.

**Section – I**

- Q.2** a) Compare requirements of industrial products with consumer products. In what way they differ from each other? **07**  
 b) Discuss the visual effect of line and form for cars and sport vehicles. **07**
- Q.3** a) Discuss the aspect of ergonomic design of radial drilling machine. **07**  
 b) Explain the statement “Form Follows Function”. **07**
- Q.4 Write short note (any two)** **14**  
 a) Concept of ergonomics and aesthetics with examples  
 b) Mechanics of seeing with suitable examples  
 c) Concept of Unit and Concept of order with suitable examples

**Section – II**

- Q.5** a) How the creative ideas are generated with the help of brain storming session? How it is effectively conducted? **07**  
 b) Explain role of setting specification and market requirements in product design. **07**
- Q.6** a) Explain in detail the process of concept development. **07**  
 b) Explain the challenges in successful product development. **07**
- Q.7 Write short note (any two)** **14**  
 a) Creativity  
 b) Cost estimation  
 c) Six hats techniques

<b>Seat No.</b>	
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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 14

## 14

- Page 4 of 12

- 10)** Tactile and visual are the types of \_\_\_\_\_.  
a) Texture                                      b) Form  
c) Shape                                         d) Colour
- 11)** Cost estimation, and thereby profitability, also is necessary for determining the economic advantage of the business.  
a) True    b) False
- 12)** One of the most difficult aspects of product development is recognizing, understanding, and managing \_\_\_\_\_.  
a) Trade-offs                                    b) Dynamics  
c) Details                                         d) Economics
- 13)** The \_\_\_\_\_ function plays the lead role in defining the physical form of the product to best meet customer needs.  
a) Design                                         b) Manufacturing  
c) Marketing                                     d) None of the above
- 14)** The collection of individuals developing a product forms the \_\_\_\_\_.  
a) Supply team                                   b) Project team  
c) Marketing team                              d) None of the above

Set	Q
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Product Design**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Answer any two questions from each Section.  
2) Figures to the right indicates full marks.  
3) Make suitable assumption if necessary and state it clearly.

## Section – I

- |            |                                   |  |           |
|------------|-----------------------------------|--|-----------|
| <b>Q.2</b> | <b>a)</b>                         | Compare requirements of industrial products with consumer products. In what way they differ from each other? | <b>07</b> |
|            | <b>b)</b>                         | Discuss the visual effect of line and form for cars and sport vehicles.                                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b>                         | Discuss the aspect of ergonomic design of radial drilling machine.   | <b>07</b> |
|            | <b>b)</b>                         | Explain the statement "Form Follows Function".   | <b>07</b> |
| <b>Q.4</b> | <b>Write short note (any two)</b> |  | <b>14</b> |
|            | <b>a)</b>                         | Concept of ergonomics and aesthetics with examples   |           |
|            | <b>b)</b>                         | Mechanics of seeing with suitable examples   |           |
|            | <b>c)</b>                         | Concept of Unit and Concept of order with suitable examples  |           |

## Section – II

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> How the creative ideas are generated with the help of brain storming session? How it is effectively conducted? | <b>07</b> |
|            | <b>b)</b> Explain role of setting specification and market requirements in product design.                               | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain in detail the process of concept development.  | <b>07</b> |
|            | <b>b)</b> Explain the challenges in successful product development.  | <b>07</b> |
| <b>Q.7</b> | <b>Write short note (any two)</b>  | <b>14</b> |
|            | <b>a)</b> Creativity   |           |
|            | <b>b)</b> Cost estimation  |           |
|            | <b>c)</b> Six hats techniques  |           |

Seat No.	
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Set	R
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Product Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options**

**14**

- 1) \_\_\_\_\_ is more detailed and physical.
 

a) Lateral thinking	b) Vertical thinking
c) Creative thinking	d) None of the above
- 2) Fear of \_\_\_\_\_ blocks creativity.
 

a) Making Mistakes	b) Being Criticized
c) Being Alone	d) All of the above
- 3) \_\_\_\_\_ helps in establishing the interchangeability of products.
 

a) Standardization	b) Simplification
c) Diversification	d) Specialization
- 4) \_\_\_\_\_ is a three-dimensional area enclosed by a surface.
 

a) Form	b) Shape
c) Line	d) None of the above
- 5) The following aspect of product is concerned with the ease and efficiency of the product performance
 

a) Functional aspect	b) Operational aspect
c) Durability aspect	d) Aesthetic aspect
- 6) The appearance of a product is the total visual effect produced by structure, form, material, dimensions and colour.
 

a) True	b) False
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- 7) Tactile and visual are the types of \_\_\_\_\_.
 

a) Texture	b) Form
c) Shape	d) Colour
- 8) Cost estimation, and thereby profitability, also is necessary for determining the economic advantage of the business.
 

a) True	b) False
---------	----------
- 9) One of the most difficult aspects of product development is recognizing, understanding, and managing \_\_\_\_\_.
 

a) Trade-offs	b) Dynamics
c) Details	d) Economics

- 10)** The \_\_\_\_\_ function plays the lead role in defining the physical form of the product to best meet customer needs.
- |              |                      |
|--------------|----------------------|
| a) Design    | b) Manufacturing     |
| c) Marketing | d) None of the above |
- 11)** The collection of individuals developing a product forms the \_\_\_\_\_.
- |                   |                      |
|-------------------|----------------------|
| a) Supply team    | b) Project team      |
| c) Marketing team | d) None of the above |
- 12)** The necessity to know the environment in which the product will be used is termed as \_\_\_\_\_.
- |                     |                    |
|---------------------|--------------------|
| a) Design Situation | b) Design Analysis |
| c) Aesthetics       | d) Ergonomics      |
- 13)** In six hats techniques, Red hat stands for \_\_\_\_\_.
- |              |                |
|--------------|----------------|
| a) Emotions  | b) Optimism    |
| c) New Ideas | d) Information |
- 14)** The design for environment is essentially due to \_\_\_\_\_.
- |                    |                     |
|--------------------|---------------------|
| a) Customer Demand | b) Government Laws  |
| c) ISO Requirement | d) All of the above |

Seat No.	
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Set 

R
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Product Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each Section.  
 2) Figures to the right indicates full marks.  
 3) Make suitable assumption if necessary and state it clearly.

**Section – I**

- Q.2** a) Compare requirements of industrial products with consumer products. In what way they differ from each other? **07**  
 b) Discuss the visual effect of line and form for cars and sport vehicles. **07**
- Q.3** a) Discuss the aspect of ergonomic design of radial drilling machine. **07**  
 b) Explain the statement “Form Follows Function”. **07**
- Q.4 Write short note (any two)** **14**  
 a) Concept of ergonomics and aesthetics with examples  
 b) Mechanics of seeing with suitable examples  
 c) Concept of Unit and Concept of order with suitable examples

**Section – II**

- Q.5** a) How the creative ideas are generated with the help of brain storming session? How it is effectively conducted? **07**  
 b) Explain role of setting specification and market requirements in product design. **07**
- Q.6** a) Explain in detail the process of concept development. **07**  
 b) Explain the challenges in successful product development. **07**
- Q.7 Write short note (any two)** **14**  
 a) Creativity  
 b) Cost estimation  
 c) Six hats techniques



Seat No.	
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Product Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options** **14**

- 1) The \_\_\_\_\_ function plays the lead role in defining the physical form of the product to best meet customer needs.
 

a) Design	b) Manufacturing
c) Marketing	d) None of the above
- 2) The collection of individuals developing a product forms the \_\_\_\_\_.
 

a) Supply team	b) Project team
c) Marketing team	d) None of the above
- 3) The necessity to know the environment in which the product will be used is termed as \_\_\_\_\_.
 

a) Design Situation	b) Design Analysis
c) Aesthetics	d) Ergonomics
- 4) In six hats techniques, Red hat stands for \_\_\_\_\_.
 

a) Emotions	b) Optimism
c) New Ideas	d) Information
- 5) The design for environment is essentially due to \_\_\_\_\_.
 

a) Customer Demand	b) Government Laws
c) ISO Requirement	d) All of the above
- 6) \_\_\_\_\_ is more detailed and physical.
 

a) Lateral thinking	b) Vertical thinking
c) Creative thinking	d) None of the above
- 7) Fear of \_\_\_\_\_ blocks creativity.
 

a) Making Mistakes	b) Being Criticized
c) Being Alone	d) All of the above
- 8) \_\_\_\_\_ helps in establishing the interchangeability of products.
 

a) Standardization	b) Simplification
c) Diversification	d) Specialization
- 9) \_\_\_\_\_ is a three-dimensional area enclosed by a surface.
 

a) Form	b) Shape
c) Line	d) None of the above

- 10)** The following aspect of product is concerned with the ease and efficiency of the product performance
- |                      |                       |
|----------------------|-----------------------|
| a) Functional aspect | b) Operational aspect |
| c) Durability aspect | d) Aesthetic aspect   |
- 11)** The appearance of a product is the total visual effect produced by structure, form, material, dimensions and colour.
- |         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|
- 12)** Tactile and visual are the types of \_\_\_\_.
- |            |           |
|------------|-----------|
| a) Texture | b) Form   |
| c) Shape   | d) Colour |
- 13)** Cost estimation, and thereby profitability, also is necessary for determining the economic advantage of the business.
- |         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|
- 14)** One of the most difficult aspects of product development is recognizing, understanding, and managing \_\_\_\_.
- |               |              |
|---------------|--------------|
| a) Trade-offs | b) Dynamics  |
| c) Details    | d) Economics |

Seat No.	
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Set 

S
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**T. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Product Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each Section.  
 2) Figures to the right indicates full marks.  
 3) Make suitable assumption if necessary and state it clearly.

**Section – I**

- Q.2** a) Compare requirements of industrial products with consumer products. In what way they differ from each other? **07**  
 b) Discuss the visual effect of line and form for cars and sport vehicles. **07**
- Q.3** a) Discuss the aspect of ergonomic design of radial drilling machine. **07**  
 b) Explain the statement “Form Follows Function”. **07**
- Q.4 Write short note (any two)** **14**  
 a) Concept of ergonomics and aesthetics with examples  
 b) Mechanics of seeing with suitable examples  
 c) Concept of Unit and Concept of order with suitable examples

**Section – II**

- Q.5** a) How the creative ideas are generated with the help of brain storming session? How it is effectively conducted? **07**  
 b) Explain role of setting specification and market requirements in product design. **07**
- Q.6** a) Explain in detail the process of concept development. **07**  
 b) Explain the challenges in successful product development. **07**
- Q.7 Write short note (any two)** **14**  
 a) Creativity  
 b) Cost estimation  
 c) Six hats techniques

Seat No.	
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Set	P
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Plastic Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In addition polymerization reaction the polymer is formed in a \_\_\_\_\_ step
  - a) single
  - b) three
  - c) double
  - d) None
- 2) Epoxy resin is example of \_\_\_\_\_ plastic
  - a) Thermoplastics
  - b) Thermosetting
  - c) elastomers
  - d) None
- 3) Which of the following is an additive used for saving base plastic material?
  - a) Fillers
  - b) Plasticizers
  - c) Pigments
  - d) None of these
- 4) \_\_\_\_\_ is the most of commonly used manufacturing process for the plastic component.
  - a) Injection molding
  - b) Blow Molding
  - c) Transfer Molding
  - d) Rotational Molding
- 5) The Rotational Molding is \_\_\_\_\_ plastic forming process
  - a) High Temperature
  - b) Low Temperature, High Pressure
  - c) Low Pressure
  - d) High Temperature, Low Pressure
- 6) For the more precise dimensional stability of Thermosets, \_\_\_\_\_ is used.
  - a) Transfer moulding
  - b) Compression moulding
  - c) Any moulding process
  - d) Calendering
- 7) In \_\_\_\_\_ welding method, the workpieces to be joined are irradiated with a stream of neutron
  - a) Infrared
  - b) Hot gas
  - c) Nuclear
  - d) Heated tool
- 8) Materials having a \_\_\_\_\_ shrinkage allowance can be molded with close tolerance.
  - a) Low
  - b) Medium
  - c) High
  - d) None



Seat No.	
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Set **P**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Plastic Engineering**

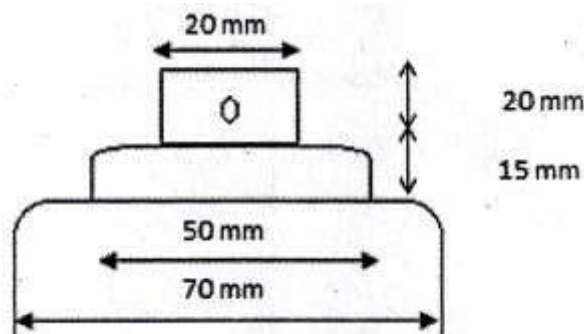
Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1 Solve any two questions from Section I and any two questions from Section II.  
 2) Assume suitable data wherever necessary and state it clearly.  
 3) Draw neat sketches wherever necessary

**Section – I**

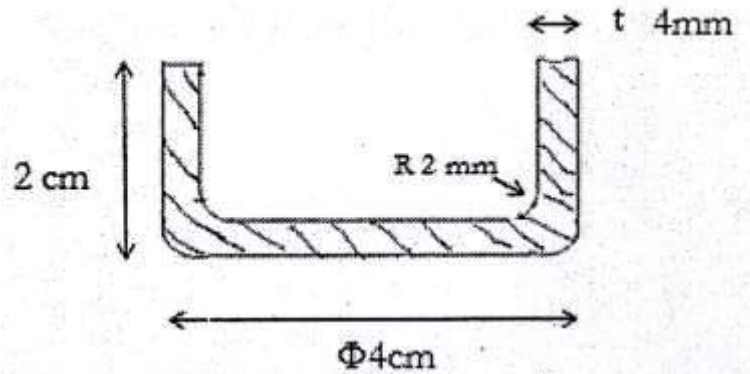
- Q.2** a) Explain the process of Injection moulding with a neat diagram. **05**  
 b) Differentiate between addition and condensation polymerization. **04**  
 c) Explain the different tests carried out on plastic material explain any one. **05**
- Q.3** a) Explain the additives used in the plastics. **04**  
 b) Explain design rules related to Ribs for plastic parts. **05**  
 c) Explain with neat sketch hot gas welding. **05**
- Q.4** a) A product has to be designed for an assembly of body of spray bottle. The body of spray bottle has the dimensions as shown in the figure below. The plastic body of spray bottle cap has to be designed to fit on the top of the bottle. The top end of the bottle is having diameter of 50 mm and its nozzle 20 mm. **07**



- b) Explain various tolerances and allowances considered for plastics parts design. **03**  
 c) Explain rotational moulding process with neat sketch. **04**

## Section – II

- Q.5** a) Explain main parts of compression mould with neat sketch. **04**  
 b) Design a compression mold for the component shown in figure below **07**  
 which is made up of melamine material. Take  $K=2$ ; compression pressure= $90 \text{ kg/cm}^2$ ; density= $1.7 \text{ gm./cm}^3$ .



- c) What are different types of injection moulds? Explain one of them with neat sketch. **03**
- Q.6** a) Explain types transfer moulds and their main parts with neat sketch. **05**  
 b) Explain cooling system for injection mould with neat sketch. **05**  
 c) Write short note on- **04**  
 i) Design of loading chamber  
 ii) Design of punch
- Q.7** a) Find out the cooling time required for a mould with heaviest wall thickness 40 mm, for polypropylene material with following properties- **05**  
 Thermal conductivity =  $0.22 \text{ w/m K}$   
 Density =  $0.545 \text{ gm/cm}^3$   
 Specific heat =  $1.68 \text{ kJ/kg K}$   
 b) Explain Ejection System for Injection mould with neat sketch. **05**  
 c) What are the applications of plastic in agriculture sector? **04**

Seat No.	
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Set	Q
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Plastic Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Materials having a \_\_\_\_\_ shrinkage allowance can be molded with close tolerance.
 

a) Low	b) Medium
c) High	d) None
- 2) The ratio of volume of loose plastic powder to the volume of moulding is known as \_\_\_\_\_.
 

a) Clamping force	b) Density factor
c) Bulk factor	d) None
- 3) The depth of loading chamber is
 

a) Inversely proportional to projected area
b) Inversely proportional to change in volume of plastic material
c) Directly proportional to projected area
d) None of the above
- 4) The heat to be removed by cooling circuits depend on
 

a) Specific heat of material
b) Injection temperature of material
c) Latent heat of material
d) All of the above
- 5) The properties of the polymer will also depend on the \_\_\_\_\_ available for cooling.
 

a) time	b) area
c) peed	d) momentum
- 6) It is the \_\_\_\_\_ operation that sets the shape of thermoplastics.
 

a) heating	b) Grinding
c) cutting	d) Cooling speed



- 7) \_\_\_\_\_ are mixed with plastics to improve their flow characteristics & decrease their brittleness.
- a) Stabilizers
  - b) Plasticizers
  - c) Colorants
  - d) Fillers
- 8) In addition polymerization reaction the polymer is formed in a \_\_\_\_\_ step
- a) single
  - b) three
  - c) double
  - d) None
- 9) Epoxy resin is example of \_\_\_\_\_ plastic
- a) Thermoplastics
  - b) Thermosetting
  - c) elastomers
  - d) None
- 10) Which of the following is an additive used for saving base plastic material?
- a) Fillers
  - b) Plasticizers
  - c) Pigments
  - d) None of these
- 11) \_\_\_\_\_ is the most of commonly used manufacturing process for the plastic component.
- a) Injection molding
  - b) Blow Molding
  - c) Transfer Molding
  - d) Rotational Molding
- 12) The Rotational Molding is \_\_\_\_\_ plastic forming process
- a) High Temperature
  - b) Low Temperature, High Pressure
  - c) Low Pressure
  - d) High Temperature, Low Pressure
- 13) For the more precise dimensional stability of Thermosets, \_\_\_\_\_ is used.
- a) Transfer moulding
  - b) Compression moulding
  - c) Any moulding process
  - d) Calendering
- 14) In \_\_\_\_\_ welding method, the workpieces to be joined are irradiated with a stream of neutron
- a) Infrared
  - b) Hot gas
  - c) Nuclear
  - d) Heated tool

Seat No.	
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Set **Q**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Plastic Engineering**

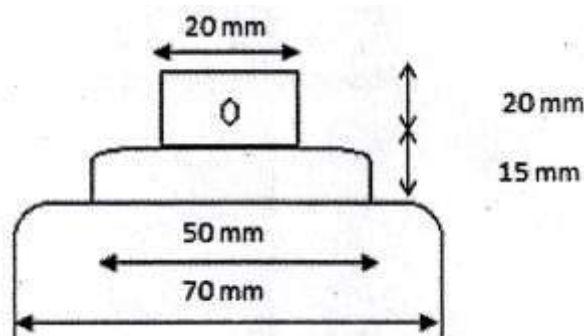
Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1 Solve any two questions from Section I and any two questions from Section II.  
 2) Assume suitable data wherever necessary and state it clearly.  
 3) Draw neat sketches wherever necessary

**Section – I**

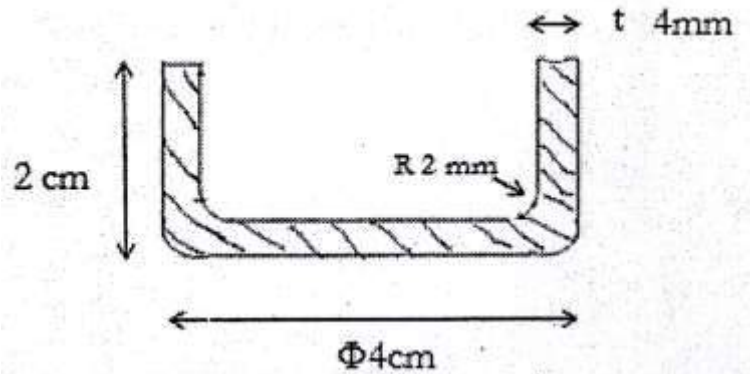
- Q.2** a) Explain the process of Injection moulding with a neat diagram. **05**  
 b) Differentiate between addition and condensation polymerization. **04**  
 c) Explain the different tests carried out on plastic material explain any one. **05**
- Q.3** a) Explain the additives used in the plastics. **04**  
 b) Explain design rules related to Ribs for plastic parts. **05**  
 c) Explain with neat sketch hot gas welding. **05**
- Q.4** a) A product has to be designed for an assembly of body of spray bottle. The body of spray bottle has the dimensions as shown in the figure below. The plastic body of spray bottle cap has to be designed to fit on the top of the bottle. The top end of the bottle is having diameter of 50 mm and its nozzle 20 mm. **07**



- b) Explain various tolerances and allowances considered for plastics parts design. **03**  
 c) Explain rotational moulding process with neat sketch. **04**

## Section – II

- Q.5** a) Explain main parts of compression mould with neat sketch. **04**  
 b) Design a compression mold for the component shown in figure below **07**  
 which is made up of melamine material. Take  $K=2$ ; compression pressure= $90 \text{ kg/cm}^2$ ; density= $1.7 \text{ gm./cm}^3$ .



- c) What are different types of injection moulds? Explain one of them with neat sketch. **03**
- Q.6** a) Explain types transfer moulds and their main parts with neat sketch. **05**  
 b) Explain cooling system for injection mould with neat sketch. **05**  
 c) Write short note on- **04**  
 i) Design of loading chamber  
 ii) Design of punch
- Q.7** a) Find out the cooling time required for a mould with heaviest wall thickness 40 mm, for polypropylene material with following properties- **05**  
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 Density =  $0.545 \text{ gm/cm}^3$   
 Specific heat =  $1.68 \text{ kJ/kg K}$   
 b) Explain Ejection System for Injection mould with neat sketch. **05**  
 c) What are the applications of plastic in agriculture sector? **04**

Seat No.	
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Set R
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Plastic Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The heat to be removed by cooling circuits depend on
  - a) Specific heat of material
  - b) Injection temperature of material
  - c) Latent heat of material
  - d) All of the above
- 2) The properties of the polymer will also depend on the \_\_\_\_\_ available for cooling.
  - a) time
  - b) area
  - c) peed
  - d) momentum
- 3) It is the \_\_\_\_\_ operation that sets the shape of thermoplastics.
  - a) heating
  - b) Grinding
  - c) cutting
  - d) Cooling speed
- 4) \_\_\_\_\_ are mixed with plastics to improve their flow characteristics & decrease their brittleness.
  - a) Stabilizers
  - b) Plasticizers
  - c) Colorants
  - d) Fillers
- 5) In addition polymerization reaction the polymer is formed in a \_\_\_\_\_ step
  - a) single
  - b) three
  - c) double
  - d) None
- 6) Epoxy resin is example of \_\_\_\_\_ plastic
  - a) Thermoplastics
  - b) Thermosetting
  - c) elastomers
  - d) None
- 7) Which of the following is an additive used for saving base plastic material?
  - a) Fillers
  - b) Plasticizers
  - c) Pigments
  - d) None of these

- 8) \_\_\_\_\_ is the most of commonly used manufacturing process for the plastic component.
- a) Injection molding
  - b) Blow Molding
  - c) Transfer Molding
  - d) Rotational Molding
- 9) The Rotational Molding is \_\_\_\_\_ plastic forming process
- a) High Temperature
  - b) Low Temperature, High Pressure
  - c) Low Pressure
  - d) High Temperature, Low Pressure
- 10) For the more precise dimensional stability of Thermosets, \_\_\_\_\_ is used.
- a) Transfer moulding
  - b) Compression moulding
  - c) Any moulding process
  - d) Calendering
- 11) In \_\_\_\_\_ welding method, the workpieces to be joined are irradiated with a steam of neutron
- a) Infrared
  - b) Hot gas
  - c) Nuclear
  - d) Heated tool
- 12) Materials having a \_\_\_\_\_ shrinkage allowance can be molded with close tolerance.
- a) Low
  - b) Medium
  - c) High
  - d) None
- 13) The ratio of volume of loose plastic powder to the volume of moulding is known as \_\_\_\_\_.
- a) Clamping force
  - b) Density factor
  - c) Bulk factor
  - d) None
- 14) The depth of loading chamber is
- a) Inversely proportional to projected area
  - b) Inversely proportional to change in volume of plastic material
  - c) Directly proportional to projected area
  - d) None of the above

Seat No.	
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Set **R**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Plastic Engineering**

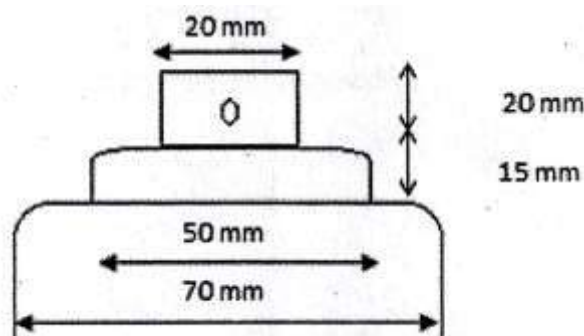
Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1 Solve any two questions from Section I and any two questions from Section II.  
 2) Assume suitable data wherever necessary and state it clearly.  
 3) Draw neat sketches wherever necessary

**Section – I**

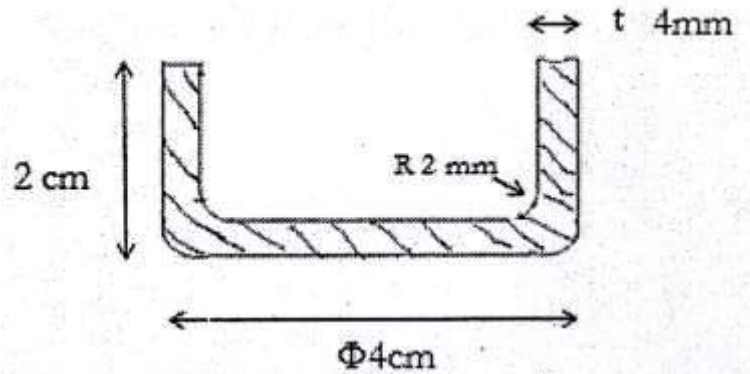
- Q.2** a) Explain the process of Injection moulding with a neat diagram. **05**  
 b) Differentiate between addition and condensation polymerization. **04**  
 c) Explain the different tests carried out on plastic material explain any one. **05**
- Q.3** a) Explain the additives used in the plastics. **04**  
 b) Explain design rules related to Ribs for plastic parts. **05**  
 c) Explain with neat sketch hot gas welding. **05**
- Q.4** a) A product has to be designed for an assembly of body of spray bottle. The body of spray bottle has the dimensions as shown in the figure below. The plastic body of spray bottle cap has to be designed to fit on the top of the bottle. The top end of the bottle is having diameter of 50 mm and its nozzle 20 mm. **07**



- b) Explain various tolerances and allowances considered for plastics parts design. **03**  
 c) Explain rotational moulding process with neat sketch. **04**

## Section – II

- Q.5** a) Explain main parts of compression mould with neat sketch. **04**  
 b) Design a compression mold for the component shown in figure below **07**  
 which is made up of melamine material. Take  $K=2$ ; compression pressure= $90 \text{ kg/cm}^2$ ; density= $1.7 \text{ gm./cm}^3$ .



- c) What are different types of injection moulds? Explain one of them with neat sketch. **03**
- Q.6** a) Explain types transfer moulds and their main parts with neat sketch. **05**  
 b) Explain cooling system for injection mould with neat sketch. **05**  
 c) Write short note on- **04**  
 i) Design of loading chamber  
 ii) Design of punch
- Q.7** a) Find out the cooling time required for a mould with heaviest wall thickness 40 mm, for polypropylene material with following properties- **05**  
 Thermal conductivity =  $0.22 \text{ w/m K}$   
 Density =  $0.545 \text{ gm/cm}^3$   
 Specific heat =  $1.68 \text{ kJ/kg K}$   
 b) Explain Ejection System for Injection mould with neat sketch. **05**  
 c) What are the applications of plastic in agriculture sector? **04**

Seat No.	
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Set	S
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Plastic Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

**Q.1 Choose the correct alternatives from the given options.** **14**

- 1) For the more precise dimensional stability of Thermosets, \_\_\_\_\_ is used.
 

a) Transfer moulding	b) Compression moulding
c) Any moulding process	d) Calendering
- 2) In \_\_\_\_\_ welding method, the workpieces to be joined are irradiated with a stream of neutron
 

a) Infrared	b) Hot gas
c) Nuclear	d) Heated tool
- 3) Materials having a \_\_\_\_\_ shrinkage allowance can be molded with close tolerance.
 

a) Low	b) Medium
c) High	d) None
- 4) The ratio of volume of loose plastic powder to the volume of moulding is known as \_\_\_\_\_.
 

a) Clamping force	b) Density factor
c) Bulk factor	d) None
- 5) The depth of loading chamber is
 

a) Inversely proportional to projected area
b) Inversely proportional to change in volume of plastic material
c) Directly proportional to projected area
d) None of the above
- 6) The heat to be removed by cooling circuits depend on
 

a) Specific heat of material
b) Injection temperature of material
c) Latent heat of material
d) All of the above



- 7) The properties of the polymer will also depend on the \_\_\_\_\_ available for cooling.
- a) time
  - b) area
  - c) peed
  - d) momentum
- 8) It is the \_\_\_\_\_ operation that sets the shape of thermoplastics.
- a) heating
  - b) Grinding
  - c) cutting
  - d) Cooling speed
- 9) \_\_\_\_\_ are mixed with plastics to improve their flow characteristics & decrease their brittleness.
- a) Stabilizers
  - b) Plasticizers
  - c) Colorants
  - d) Fillers
- 10) In addition polymerization reaction the polymer is formed in a \_\_\_\_\_ step
- a) single
  - b) three
  - c) double
  - d) None
- 11) Epoxy resin is example of \_\_\_\_\_ plastic
- a) Thermoplastics
  - b) Thermosetting
  - c) elastomers
  - d) None
- 12) Which of the following is an additive used for saving base plastic material?
- a) Fillers
  - b) Plasticizers
  - c) Pigments
  - d) None of these
- 13) \_\_\_\_\_ is the most of commonly used manufacturing process for the plastic component.
- a) Injection molding
  - b) Blow Molding
  - c) Transfer Molding
  - d) Rotational Molding
- 14) The Rotational Molding is \_\_\_\_\_ plastic forming process
- a) High Temperature
  - b) Low Temperature, High Pressure
  - c) Low Pressure
  - d) High Temperature, Low Pressure

Seat No.	
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Set **S**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Plastic Engineering**

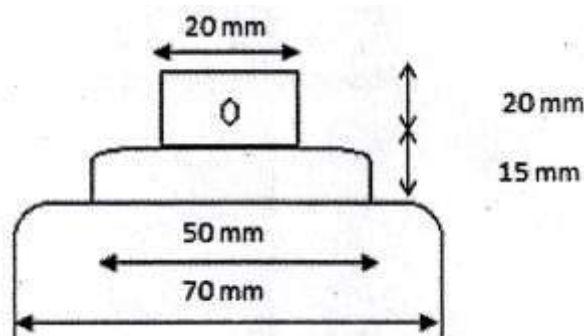
Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1 Solve any two questions from Section I and any two questions from Section II.  
 2) Assume suitable data wherever necessary and state it clearly.  
 3) Draw neat sketches wherever necessary

**Section – I**

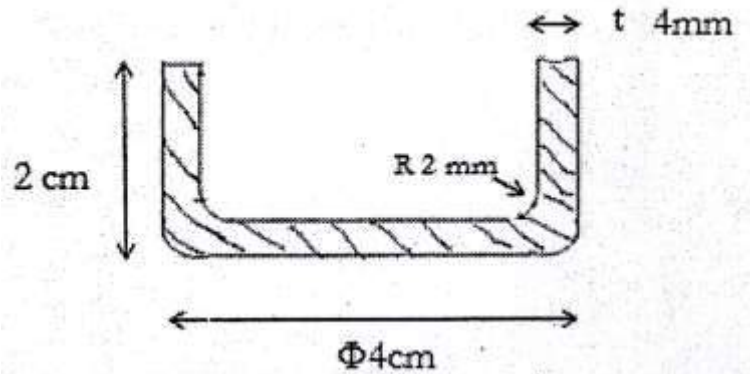
- Q.2** a) Explain the process of Injection moulding with a neat diagram. **05**  
 b) Differentiate between addition and condensation polymerization. **04**  
 c) Explain the different tests carried out on plastic material explain any one. **05**
- Q.3** a) Explain the additives used in the plastics. **04**  
 b) Explain design rules related to Ribs for plastic parts. **05**  
 c) Explain with neat sketch hot gas welding. **05**
- Q.4** a) A product has to be designed for an assembly of body of spray bottle. The body of spray bottle has the dimensions as shown in the figure below. The plastic body of spray bottle cap has to be designed to fit on the top of the bottle. The top end of the bottle is having diameter of 50 mm and its nozzle 20 mm. **07**



- b) Explain various tolerances and allowances considered for plastics parts design. **03**  
 c) Explain rotational moulding process with neat sketch. **04**

## Section – II

- Q.5** a) Explain main parts of compression mould with neat sketch. **04**  
 b) Design a compression mold for the component shown in figure below which is made up of melamine material. Take  $K=2$ ; compression pressure= $90 \text{ kg/cm}^2$ ; density= $1.7 \text{ gm./cm}^3$ . **07**



- c) What are different types of injection moulds? Explain one of them with neat sketch. **03**
- Q.6** a) Explain types transfer moulds and their main parts with neat sketch. **05**  
 b) Explain cooling system for injection mould with neat sketch. **05**  
 c) Write short note on- **04**  
     i) Design of loading chamber  
     ii) Design of punch
- Q.7** a) Find out the cooling time required for a mould with heaviest wall thickness 40 mm, for polypropylene material with following properties- **05**  
     Thermal conductivity =  $0.22 \text{ w/m K}$   
     Density =  $0.545 \text{ gm/cm}^3$   
     Specific heat =  $1.68 \text{ kJ/kg k}$   
 b) Explain Ejection System for Injection mould with neat sketch. **05**  
 c) What are the applications of plastic in agriculture sector? **04**

Seat No.	
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Set	P
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Transportation**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Objective types of questions**

**14**

- 1) Which of the following is not a type of Urban Trains?
 

a) Monorail Train	b) Metro train
c) Tram Train	d) Bullet Train
- 2) Which of the following is not a type of Freight Trains?
 

a) Shunting Trains	b) Pilots Trains
c) Funicular Train	d) Merry Go Round (MGR) Train
- 3) Power Locomotives includes \_\_\_\_\_
 

a) Steam Locomotive	
b) Diesel Locomotive	
c) Electric Locomotive	
d) All of the above	
- 4) Single rail Car includes \_\_\_\_\_
 

a) Diesel	b) Electric
c) Gas Turbine	d) All of the above
- 5) Types of Freight Train includes \_\_\_\_\_
 

a) Conventional Load	b) Hazardous Goods
c) Transport Small parcels	d) All of the above
- 6) Railway Operations includes \_\_\_\_\_
 

a) Technical	b) Commercial
c) Maintenance	d) All of the above
- 7) Which of the following is not a part of Track Panel?
 

a) Rails	b) Sleepers
c) Ballast	d) Elastic Pads
- 8) The Static vertical load includes \_\_\_\_\_
 

a) Axle load	b) Wheel weight
c) Daily Traffic load	d) All of the above
- 9) Adhesion force is a part of \_\_\_\_\_
 

a) Braking Force	b) Longitudinal force
c) Traction force	d) All of the above



Seat No.	
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Set	P
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Transportation**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Marks : 56

**Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | Explain difference between Monorail Metrorail.  | <b>04</b> |
| b) | Explain Push-Pull train operation.              | <b>04</b> |
| c) | What are the types of Passenger carrier trains? | <b>06</b> |

**Q.3 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | What are the capabilities of the railway system? Explain any one in detail.     | <b>06</b> |
| b) | What are the advantages and disadvantages of the railway transportation?        | <b>04</b> |
| c) | Explain behavior of a single railway wheel set and behavior of a whole vehicle. | <b>04</b> |

**Q.4 Solve:**

- |    |  |           |
|----|--|-----------|
| a) | What are the types of causes of Derailment? Explain in brief.        | <b>06</b> |
| b) | Write a short note on Derailment as a result of vehicle overturning. | <b>04</b> |
| c) | Write a classification of Freight carrier trains.                    | <b>04</b> |

**Section – II**

**Q.5 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | What are the types of 'Vertical loads' on rail? Explain any One in detail.  | <b>04</b> |
| b) | What are the types of 'Design loads of bridges'? Draw loading model for Model 71 and Model SW.  | <b>04</b> |
| c) | A train with 20 wagons, each weighing 18 t, is supposed to run at a speed of 50 km/h. The tractive effort of a 2-8-2 locomotive with a 22.5 t load on each driving axle is 15t. The weight of the locomotive is 120t. The rolling resistance of the wagons and locomotive are 2.5 kg/t and 3.5 kg/t, respectively. The resistance, which depends upon the speed, is computed to be 2.65 t. Find out the steepest gradient for these conditions. | <b>06</b> |

**Q.6 Solve:**

- a)** Explain Wave motion theory for the Development of Creep. **04**
- b)** What are the types of 'Longitudinal loads' on rail? Explain any One in detail. **04**
- c)** Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22t each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. What would be the further reduction in speed if the train has to negotiate a 4° curve on the rising gradient? Assume the coefficient of friction to be 0.2. **06**

**Q.7 Solve:**

- a)** What are the types of 'Transverse loads' on rail? Explain any one in detail. **04**
- b)** What are the types Bogies? Explain any one in details. **04**
- c)** List and explain the various resistances that a locomotive in motion has to overcome. **06**

Seat No.	
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Set Q
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Transportation**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Objective types of questions**

**14**

- 1) The Static vertical load includes \_\_\_\_\_
  - a) Axle load
  - b) Wheel weight
  - c) Daily Traffic load
  - d) All of the above
- 2) Adhesion force is a part of \_\_\_\_\_
  - a) Braking Force
  - b) Longitudinal force
  - c) Traction force
  - d) All of the above
- 3) Rail creep force is a part of \_\_\_\_\_
  - a) Braking Force
  - b) Longitudinal force
  - c) Traction force
  - d) All of the above
- 4) The internal reason of derailment includes \_\_\_\_\_
  - a) Excessive speed
  - b) Poor condition and design of rolling stock
  - c) Poor quality and track layout
  - d) All of the above
- 5) This of the following is not a part of Railway maintenance operations \_\_\_\_\_.
  - a) Railway Infrastructure
  - b) Marketing
  - c) Rolling stocks
  - d) Equipment used for Railway Operations
- 6) This of the following is not a part of Railway systems and premises \_\_\_\_\_
  - a) Railway Stations
  - b) Railway Depots
  - c) Bridges
  - d) Staff Quarters
- 7) The characteristics of curve resistance is
  - a) Curve resistance increases with the speed of the train
  - b) Curve resistance depends upon the central angle of the curve
  - c) Curve resistance is less with new rails compared to that with old rails
  - d) All of the above



- 8) Which of the following is not a type of Urban Trains?
  - a) Monorail Train
  - b) Metro train
  - c) Tram Train
  - d) Bullet Train
- 9) Which of the following is not a type of Freight Trains?
  - a) Shunting Trains
  - b) Pilots Trains
  - c) Funicular Train
  - d) Merry Go Round (MGR) Train
- 10) Power Locomotives includes \_\_\_\_
  - a) Steam Locomotive
  - b) Diesel Locomotive
  - c) Electric Locomotive
  - d) All of the above
- 11) Single rail Car includes \_\_\_\_
  - a) Diesel
  - b) Electric
  - c) Gas Turbine
  - d) All of the above
- 12) Types of Freight Train includes \_\_\_\_
  - a) Conventional Load
  - b) Hazardous Goods
  - c) Transport Small parcels
  - d) All of the above
- 13) Railway Operations includes \_\_\_\_
  - a) Technical
  - b) Commercial
  - c) Maintenance
  - d) All of the above
- 14) Which of the following is not a part of Track Panel?
  - a) Rails
  - b) Sleepers
  - c) Ballast
  - d) Elastic Pads

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Transportation**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Marks : 56

**Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | Explain difference between Monorail Metrorail.  | <b>04</b> |
| b) | Explain Push-Pull train operation.              | <b>04</b> |
| c) | What are the types of Passenger carrier trains? | <b>06</b> |

**Q.3 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | What are the capabilities of the railway system? Explain any one in detail.     | <b>06</b> |
| b) | What are the advantages and disadvantages of the railway transportation?        | <b>04</b> |
| c) | Explain behavior of a single railway wheel set and behavior of a whole vehicle. | <b>04</b> |

**Q.4 Solve:**

- |    |  |           |
|----|--|-----------|
| a) | What are the types of causes of Derailment? Explain in brief.        | <b>06</b> |
| b) | Write a short note on Derailment as a result of vehicle overturning. | <b>04</b> |
| c) | Write a classification of Freight carrier trains.                    | <b>04</b> |

**Section – II**

**Q.5 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | What are the types of 'Vertical loads' on rail? Explain any One in detail.  | <b>04</b> |
| b) | What are the types of 'Design loads of bridges'? Draw loading model for Model 71 and Model SW.  | <b>04</b> |
| c) | A train with 20 wagons, each weighing 18 t, is supposed to run at a speed of 50 km/h. The tractive effort of a 2-8-2 locomotive with a 22.5 t load on each driving axle is 15t. The weight of the locomotive is 120t. The rolling resistance of the wagons and locomotive are 2.5 kg/t and 3.5 kg/t, respectively. The resistance, which depends upon the speed, is computed to be 2.65 t. Find out the steepest gradient for these conditions. | <b>06</b> |

**Q.6 Solve:**

- a)** Explain Wave motion theory for the Development of Creep. **04**
- b)** What are the types of 'Longitudinal loads' on rail? Explain any One in detail. **04**
- c)** Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22t each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. What would be the further reduction in speed if the train has to negotiate a 4° curve on the rising gradient? Assume the coefficient of friction to be 0.2. **06**

**Q.7 Solve:**

- a)** What are the types of 'Transverse loads' on rail? Explain any one in detail. **04**
- b)** What are the types Bogies? Explain any one in details. **04**
- c)** List and explain the various resistances that a locomotive in motion has to overcome. **06**

Seat No.	
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Set R
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Transportation**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Objective types of questions**

**14**

- 1) The internal reason of derailment includes \_\_\_\_\_
  - a) Excessive speed
  - b) Poor condition and design of rolling stock
  - c) Poor quality and track layout
  - d) All of the above
- 2) This of the following is not a part of Railway maintenance operations \_\_\_\_\_.
  - a) Railway Infrastructure
  - b) Marketing
  - c) Rolling stocks
  - d) Equipment used for Railway Operations
- 3) This of the following is not a part of Railway systems and premises \_\_\_\_\_
 

a) Railway Stations	b) Railway Depots
c) Bridges	d) Staff Quarters
- 4) The characteristics of curve resistance is
  - a) Curve resistance increases with the speed of the train
  - b) Curve resistance depends upon the central angle of the curve
  - c) Curve resistance is less with new rails compared to that with old rails
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- 5) Which of the following is not a type of Urban Trains?
 

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b) Electric  
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- 9) Types of Freight Train includes \_\_\_\_\_  
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- 11) Which of the following is not a part of Track Panel?  
a) Rails  
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c) Ballast  
d) Elastic Pads
- 12) The Static vertical load includes \_\_\_\_\_  
a) Axle load  
b) Wheel weight  
c) Daily Traffic load  
d) All of the above
- 13) Adhesion force is a part of \_\_\_\_\_  
a) Braking Force  
b) Longitudinal force  
c) Traction force  
d) All of the above
- 14) Rail creep force is a part of \_\_\_\_\_  
a) Braking Force  
b) Longitudinal force  
c) Traction force  
d) All of the above

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Transportation**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Marks : 56

**Instructions:** 1) All question are compulsory.  
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**Section – I**

**Q.2 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | Explain difference between Monorail Metrorail.  | <b>04</b> |
| b) | Explain Push-Pull train operation.              | <b>04</b> |
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- |    |   |           |
|----|---|-----------|
| a) | What are the capabilities of the railway system? Explain any one in detail.     | <b>06</b> |
| b) | What are the advantages and disadvantages of the railway transportation?        | <b>04</b> |
| c) | Explain behavior of a single railway wheel set and behavior of a whole vehicle. | <b>04</b> |

**Q.4 Solve:**

- |    |  |           |
|----|--|-----------|
| a) | What are the types of causes of Derailment? Explain in brief.        | <b>06</b> |
| b) | Write a short note on Derailment as a result of vehicle overturning. | <b>04</b> |
| c) | Write a classification of Freight carrier trains.                    | <b>04</b> |

**Section – II**

**Q.5 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | What are the types of 'Vertical loads' on rail? Explain any One in detail.  | <b>04</b> |
| b) | What are the types of 'Design loads of bridges'? Draw loading model for Model 71 and Model SW.  | <b>04</b> |
| c) | A train with 20 wagons, each weighing 18 t, is supposed to run at a speed of 50 km/h. The tractive effort of a 2-8-2 locomotive with a 22.5 t load on each driving axle is 15t. The weight of the locomotive is 120t. The rolling resistance of the wagons and locomotive are 2.5 kg/t and 3.5 kg/t, respectively. The resistance, which depends upon the speed, is computed to be 2.65 t. Find out the steepest gradient for these conditions. | <b>06</b> |

**Q.6 Solve:**

- a)** Explain Wave motion theory for the Development of Creep. **04**
- b)** What are the types of 'Longitudinal loads' on rail? Explain any One in detail. **04**
- c)** Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22t each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. What would be the further reduction in speed if the train has to negotiate a  $4^\circ$  curve on the rising gradient? Assume the coefficient of friction to be 0.2. **06**

**Q.7 Solve:**

- a)** What are the types of 'Transverse loads' on rail? Explain any one in detail. **04**
- b)** What are the types Bogies? Explain any one in details. **04**
- c)** List and explain the various resistances that a locomotive in motion has to overcome. **06**

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Transportation**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Objective types of questions**

**14**

- 1) Railway Operations includes \_\_\_\_\_
  - a) Technical
  - b) Commercial
  - c) Maintenance
  - d) All of the above
- 2) Which of the following is not a part of Track Panel?
  - a) Rails
  - b) Sleepers
  - c) Ballast
  - d) Elastic Pads
- 3) The Static vertical load includes \_\_\_\_\_
  - a) Axle load
  - b) Wheel weight
  - c) Daily Traffic load
  - d) All of the above
- 4) Adhesion force is a part of \_\_\_\_\_
  - a) Braking Force
  - b) Longitudinal force
  - c) Traction force
  - d) All of the above
- 5) Rail creep force is a part of \_\_\_\_\_
  - a) Braking Force
  - b) Longitudinal force
  - c) Traction force
  - d) All of the above
- 6) The internal reason of derailment includes \_\_\_\_\_
  - a) Excessive speed
  - b) Poor condition and design of rolling stock
  - c) Poor quality and track layout
  - d) All of the above
- 7) This of the following is not a part of Railway maintenance operations \_\_\_\_\_.
  - a) Railway Infrastructure
  - b) Marketing
  - c) Rolling stocks
  - d) Equipment used for Railway Operations



- 8) This of the following is not a part of Railway systems and premises \_\_\_\_\_  
a) Railway Stations                      b) Railway Depots  
c) Bridges                                  d) Staff Quarters
- 9) The characteristics of curve resistance is  
a) Curve resistance increases with the speed of the train  
b) Curve resistance depends upon the central angle of the curve  
c) Curve resistance is less with new rails compared to that with old rails  
d) All of the above
- 10) Which of the following is not a type of Urban Trains?  
a) Monorail Train                      b) Metro train  
c) Tram Train                          d) Bullet Train
- 11) Which of the following is not a type of Freight Trains?  
a) Shunting Trains                      b) Pilots Trains  
c) Funicular Train                      d) Merry Go Round (MGR) Train
- 12) Power Locomotives includes \_\_\_\_\_  
a) Steam Locomotive  
b) Diesel Locomotive  
c) Electric Locomotive  
d) All of the above
- 13) Single rail Car includes \_\_\_\_\_  
a) Diesel                                  b) Electric  
c) Gas Turbine                          d) All of the above
- 14) Types of Freight Train includes \_\_\_\_\_  
a) Conventional Load                      b) Hazardous Goods  
c) Transport Small parcels                      d) All of the above

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Transportation**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Marks : 56

**Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.  
 3) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | Explain difference between Monorail Metrorail.  | <b>04</b> |
| b) | Explain Push-Pull train operation.              | <b>04</b> |
| c) | What are the types of Passenger carrier trains? | <b>06</b> |

**Q.3 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | What are the capabilities of the railway system? Explain any one in detail.     | <b>06</b> |
| b) | What are the advantages and disadvantages of the railway transportation?        | <b>04</b> |
| c) | Explain behavior of a single railway wheel set and behavior of a whole vehicle. | <b>04</b> |

**Q.4 Solve:**

- |    |  |           |
|----|--|-----------|
| a) | What are the types of causes of Derailment? Explain in brief.        | <b>06</b> |
| b) | Write a short note on Derailment as a result of vehicle overturning. | <b>04</b> |
| c) | Write a classification of Freight carrier trains.                    | <b>04</b> |

**Section – II**

**Q.5 Solve:**

- |    |   |           |
|----|---|-----------|
| a) | What are the types of 'Vertical loads' on rail? Explain any One in detail.  | <b>04</b> |
| b) | What are the types of 'Design loads of bridges'? Draw loading model for Model 71 and Model SW.  | <b>04</b> |
| c) | A train with 20 wagons, each weighing 18 t, is supposed to run at a speed of 50 km/h. The tractive effort of a 2-8-2 locomotive with a 22.5 t load on each driving axle is 15t. The weight of the locomotive is 120t. The rolling resistance of the wagons and locomotive are 2.5 kg/t and 3.5 kg/t, respectively. The resistance, which depends upon the speed, is computed to be 2.65 t. Find out the steepest gradient for these conditions. | <b>06</b> |

**Q.6 Solve:**

- |           |   |           |
|-----------|---|-----------|
| <b>a)</b> | Explain Wave motion theory for the Development of Creep.  | <b>04</b> |
| <b>b)</b> | What are the types of 'Longitudinal loads' on rail? Explain any One in detail.  | <b>04</b> |
| <b>c)</b> | Calculate the maximum permissible load that a BG locomotive with three pairs of driving wheels bearing an axle load of 22t each can pull on a straight level track at a speed of 80 km/h. Also calculate the reduction in speed if the train has to run on a rising gradient of 1 in 200. What would be the further reduction in speed if the train has to negotiate a 4° curve on the rising gradient? Assume the coefficient of friction to be 0.2. | <b>06</b> |

**Q.7 Solve:**

- |           |   |           |
|-----------|---|-----------|
| <b>a)</b> | What are the types of 'Transverse loads' on rail? Explain any one in detail.          | <b>04</b> |
| <b>b)</b> | What are the types Bogies? Explain any one in details.                                | <b>04</b> |
| <b>c)</b> | List and explain the various resistances that a locomotive in motion has to overcome. | <b>06</b> |

Seat No.	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Design Practice**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is golden band between Researcher based design & creative design.
 

a) why not	b) where to do
c) why to do	d) how to do
- 2) \_\_\_\_\_ is example of tangible product.
 

a) cycle	b) hotel
c) airline	d) services of doctors
- 3) Generally, Rockwell and Brinell test are used for \_\_\_\_\_ testing.
 

a) brittleness	b) ductility
c) hardness	d) toughness
- 4) At the very beginning involving everybody together to emerge the engineering design is called \_\_\_\_\_.
 

a) social work in design	b) smart work in design
c) reliable concept in engineering	d) concurrent concept of engineering design
- 5) FMEA Means \_\_\_\_\_.
 

a) failure mode effect analysis	b) failure mode efficiency analysis
c) failure mode end analysis	d) failure mode energy analysis
- 6) \_\_\_\_\_ is a set of graphical pasteurization of operation and various movements, so that it from using this you can make a graphical representation of any process or operation.
 

a) Therblig	b) Bar chart study
c) Flow chart	d) System
- 7) Brain storming may be \_\_\_\_\_.
 

a) group creativity technique	b) individual creative technique
c) silent technique	d) very difficult technique to learn
- 8) \_\_\_\_\_ is depends upon availability of material.
 

a) true design	b) rational design
c) optimum design	d) configuration design

- 9) \_\_\_\_\_ is first step in material selection.
- |                |              |
|----------------|--------------|
| a) Translation | b) Screening |
| c) Detaching   | d) Attaching |
- 10) Screening by applying attribute limits, that is known as \_\_\_\_\_.
- |                    |                    |
|--------------------|--------------------|
| a) Delphy's method | b) Crachy's method |
| c) Ashby's method  | d) Raighter method |

<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Design Practice**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Answer any four questions from the following questions.  
2) Figures to the right indicate full marks

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | Explain steps in material selection process.  | <b>10</b> |
| <b>Q.3</b> | Why we use concurrent engineering? Explain in detail.   | <b>10</b> |
| <b>Q.4</b> | With the help of suitable case study, explain Serial engineering Versus Concurrent engineering. | <b>10</b> |
| <b>Q.5</b> | Explain design of work system in detail.  | <b>10</b> |
| <b>Q.6</b> | Explain Failure Mode Effect Analysis in detail.   | <b>10</b> |
| <b>Q.7</b> | Explain material property chart in detail.  | <b>10</b> |
| <b>Q.8</b> | Write short note on Design thinking and innovation.   | <b>10</b> |

Seat No.	
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Set Q
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Design Practice**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is a set of graphical pasteurization of operation and various movements, so that it from using this you can make a graphical representation of any process or operation.
 

a) Therblig	b) Bar chart study
c) Flow chart	d) System
- 2) Brain storming may be \_\_\_\_\_.
 

a) group creativity technique	b) individual creative technique
c) silent technique	d) very difficult technique to learn
- 3) \_\_\_\_\_ is depends upon availability of material.
 

a) true design	b) rational design
c) optimum design	d) configuration design
- 4) \_\_\_\_\_ is first step in material selection.
 

a) Translation	b) Screening
c) Detaching	d) Attaching
- 5) Screening by applying attribute limits, that is known as \_\_\_\_\_.
 

a) Delphy's method	b) Crachy's method
c) Ashby's method	d) Raighter method
- 6) \_\_\_\_\_ is golden band between Researcher based design & creative design.
 

a) why not	b) where to do
c) why to do	d) how to do
- 7) \_\_\_\_\_ is example of tangible product.
 

a) cycle	b) hotel
c) airline	d) services of doctors
- 8) Generally, Rockwell and Brinell test are used for \_\_\_\_\_ testing.
 

a) brittleness	b) ductility
c) hardness	d) toughness

- 9)** At the very beginning involving everybody together to emerge the engineering design is called \_\_\_\_\_.  
a) social work in design  
b) smart work in design  
c) reliable concept in engineering  
d) concurrent concept of engineering design
- 10)** FMEA Means \_\_\_\_\_.  
a) failure mode effect analysis      b) failure mode efficiency analysis  
c) failure mode end analysis      d) failure mode energy analysis



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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Design Practice**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Answer any four questions from the following questions.  
2) Figures to the right indicate full marks

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | Explain steps in material selection process.  | <b>10</b> |
| <b>Q.3</b> | Why we use concurrent engineering? Explain in detail.   | <b>10</b> |
| <b>Q.4</b> | With the help of suitable case study, explain Serial engineering Versus Concurrent engineering. | <b>10</b> |
| <b>Q.5</b> | Explain design of work system in detail.  | <b>10</b> |
| <b>Q.6</b> | Explain Failure Mode Effect Analysis in detail.   | <b>10</b> |
| <b>Q.7</b> | Explain material property chart in detail.  | <b>10</b> |
| <b>Q.8</b> | Write short note on Design thinking and innovation.   | <b>10</b> |

Seat No.	
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Set R
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Design Practice**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is first step in material selection.
 

a) Translation	b) Screening
c) Detaching	d) Attaching
- 2) Screening by applying attribute limits, that is known as \_\_\_\_\_.
 

a) Delphy's method	b) Crachy's method
c) Ashby's method	d) Raighter method
- 3) \_\_\_\_\_ is golden band between Researcher based design & creative design.
 

a) why not	b) where to do
c) why to do	d) how to do
- 4) \_\_\_\_\_ is example of tangible product.
 

a) cycle	b) hotel
c) airline	d) services of doctors
- 5) Generally, Rockwell and Brinell test are used for \_\_\_\_\_ testing.
 

a) brittleness	b) ductility
c) hardness	d) toughness
- 6) At the very beginning involving everybody together to emerge the engineering design is called \_\_\_\_\_.
 

a) social work in design
b) smart work in design
c) reliable concept in engineering
d) concurrent concept of engineering design
- 7) FMEA Means \_\_\_\_\_.
 

a) failure mode effect analysis	b) failure mode efficiency analysis
c) failure mode end analysis	d) failure mode energy analysis
- 8) \_\_\_\_\_ is a set of graphical pasteurization of operation and various movements, so that it from using this you can make a graphical representation of any process or operation.
 

a) Therblig	b) Bar chart study
c) Flow chart	d) System

- 9) Brain storming may be \_\_\_\_\_.  
a) group creativity technique      b) individual creative technique  
c) silent technique                      d) very difficult technique to learn
- 10) \_\_\_\_\_ is depends upon availability of material.  
a) true design                              b) rational design  
c) optimum design                        d) configuration design

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Design Practice**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Answer any four questions from the following questions.  
2) Figures to the right indicate full marks

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | Explain steps in material selection process.  | <b>10</b> |
| <b>Q.3</b> | Why we use concurrent engineering? Explain in detail.   | <b>10</b> |
| <b>Q.4</b> | With the help of suitable case study, explain Serial engineering Versus Concurrent engineering. | <b>10</b> |
| <b>Q.5</b> | Explain design of work system in detail.  | <b>10</b> |
| <b>Q.6</b> | Explain Failure Mode Effect Analysis in detail.   | <b>10</b> |
| <b>Q.7</b> | Explain material property chart in detail.  | <b>10</b> |
| <b>Q.8</b> | Write short note on Design thinking and innovation.   | <b>10</b> |

Seat No.	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Design Practice**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Generally, Rockwell and Brinell test are used for \_\_\_\_\_ testing.
 

a) brittleness	b) ductility
c) hardness	d) toughness
- 2) At the very beginning involving everybody together to emerge the engineering design is called \_\_\_\_\_.
 

a) social work in design
b) smart work in design
c) reliable concept in engineering
d) concurrent concept of engineering design
- 3) FMEA Means \_\_\_\_\_.
 

a) failure mode effect analysis	b) failure mode efficiency analysis
c) failure mode end analysis	d) failure mode energy analysis
- 4) \_\_\_\_\_ is a set of graphical pasteurization of operation and various movements, so that it from using this you can make a graphical representation of any process or operation.
 

a) Therblig	b) Bar chart study
c) Flow chart	d) System
- 5) Brain storming may be \_\_\_\_\_.
 

a) group creativity technique	b) individual creative technique
c) silent technique	d) very difficult technique to learn
- 6) \_\_\_\_\_ is depends upon availability of material.
 

a) true design	b) rational design
c) optimum design	d) configuration design
- 7) \_\_\_\_\_ is first step in material selection.
 

a) Translation	b) Screening
c) Detaching	d) Attaching
- 8) Screening by applying attribute limits, that is known as \_\_\_\_\_.
 

a) Delphy's method	b) Crachy's method
c) Ashby's method	d) Raighter method

- 9) \_\_\_\_\_ is golden band between Researcher based design & creative design.
- |              |                |
|--------------|----------------|
| a) why not   | b) where to do |
| c) why to do | d) how to do   |
- 10) \_\_\_\_\_ is example of tangible product.
- |            |                        |
|------------|------------------------|
| a) cycle   | b) hotel               |
| c) airline | d) services of doctors |

**SLR-HL-128**

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Design Practice**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Answer any four questions from the following questions.  
2) Figures to the right indicate full marks

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | Explain steps in material selection process.  | <b>10</b> |
| <b>Q.3</b> | Why we use concurrent engineering? Explain in detail.   | <b>10</b> |
| <b>Q.4</b> | With the help of suitable case study, explain Serial engineering Versus Concurrent engineering. | <b>10</b> |
| <b>Q.5</b> | Explain design of work system in detail.  | <b>10</b> |
| <b>Q.6</b> | Explain Failure Mode Effect Analysis in detail.   | <b>10</b> |
| <b>Q.7</b> | Explain material property chart in detail.  | <b>10</b> |
| <b>Q.8</b> | Write short note on Design thinking and innovation.   | <b>10</b> |

Seat No.	
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Set	P
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**  
**Joining Technologies for Metals**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicate full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which of the following defects occur when the deposited metal is not focused on the root of weld?
 

a) Inclusion of slag	b) inadequate penetration
c) Incomplete fusion	d) Porosity
- 2) Following gases are used in tungsten inert gas welding
 

a) hydrogen and oxygen	b) CO <sub>2</sub> and H <sub>2</sub>
c) argon and neon	d) helium and neon
- 3) Which of the following welding process uses non-consumable electrodes
 

a) LASER welding	b) MIG welding
c) TIG welding	d) ion beam welding
- 4) The metal is solidified in the joint is called
 

a) Base metal	
b) Weld metal	
c) Creator	
d) Cold face	
- 5) TIG welding is best suited for welding
 

a) Mild steel	b) Stainless steel
c) Carbon steel	d) Aluminium
- 6) Welding process which generally not preferred for the joining of austenitic stainless steel is
 

a) Submerged arc welding	b) Shielded metal arc welding
c) Tungsten inert gas welding	d) Metal inert gas welding
- 7) Which of the following factor does not promote the solidification cracking?
 

a) metal under compression	
b) Lack of ferrite in austenitic stainless steel	
c) Incorrect filler in aluminum alloys	
d) none	
- 8) Preheating a low alloy steel prior to welding to minimize the risk of \_\_\_\_\_.
 

a) excessive distortion	b) porosity
c) weld cracking	d) Lack of fusion



- 9)** The temperature of a carburising flame in gas welding is \_\_\_\_\_ that of a neutral or Oxidizing flame.
- |               |                 |
|---------------|-----------------|
| a) lower than | b) higher than  |
| c) equal to   | d) unrelated to |
- 10)** In arc welding is created between the electrode and work by
- |                             |                       |
|-----------------------------|-----------------------|
| a) Flow of current          | b) Voltage            |
| c) Material characteristics | d) Contact resistance |

Seat No.	
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Set	P
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**  
**Joining Technologies for Metals**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instruction:** 1) Solve **any two** questions from **each** Section.  
2) **Use** of scientific calculator is **allowed**.  
3) Figures to **right** indicate **full** marks.  
4) Assume additional **suitable** data **if necessary** and state it **clearly**.  
5) Use university graph paper & semi-log paper if required.

**Section - I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain submerged arc welding.                         | <b>05</b> |
|            | <b>b)</b> Give comparison between TIG and MIG welding processes. | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain the effect of gases on Weld Properties.        | <b>05</b> |
|            | <b>b)</b> Classify Joining Process.                              | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Explain Welding parameters.                            | <b>05</b> |
|            | <b>b)</b> Explain Oxy Fuel Gas welding.                          | <b>05</b> |

**Section - II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What are the common aluminium welding defects?       | <b>05</b> |
|            | <b>b)</b> What is weld Thermal Cycle?                          | <b>05</b> |
| <b>Q.6</b> | <b>a)</b> Explain Solidification Cracking.                     | <b>05</b> |
|            | <b>b)</b> What is Haz Softening?                               | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Write a note on Residual stress in weld joint.       | <b>05</b> |
|            | <b>b)</b> Write a note on Fundamental of weldability of metal. | <b>05</b> |

Seat No.	
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Set Q
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Joining Technologies for Metals**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which of the following defects occur when the deposited metal is not focused on the root of weld?
 

a) Inclusion of slag	b) inadequate penetration
c) Incomplete fusion	d) Porosity
- 2) Following gases are used in tungsten inert gas welding
 

a) hydrogen and oxygen	b) CO <sub>2</sub> and H <sub>2</sub>
c) argon and neon	d) helium and neon
- 3) Which of the following welding process uses non-consumable electrodes
 

a) LASER welding	b) MIG welding
c) TIG welding	d) ion beam welding
- 4) The metal is solidified in the joint is called
 

a) Base metal	
b) Weld metal	
c) Creator	
d) Cold face	
- 5) TIG welding is best suited for welding
 

a) Mild steel	b) Stainless steel
c) Carbon steel	d) Aluminium
- 6) Welding process which generally not preferred for the joining of austenitic stainless steel is
 

a) Submerged arc welding	b) Shielded metal arc welding
c) Tungsten inert gas welding	d) Metal inert gas welding
- 7) Which of the following factor does not promote the solidification cracking?
 

a) metal under compression	
b) Lack of ferrite in austenitic stainless steel	
c) Incorrect filler in aluminum alloys	
d) none	
- 8) Preheating a low alloy steel prior to welding to minimize the risk of \_\_\_\_\_.
 

a) excessive distortion	b) porosity
c) weld cracking	d) Lack of fusion

- 9)** The temperature of a carburising flame in gas welding is \_\_\_\_\_ that of a neutral or Oxidizing flame.
- |               |                 |
|---------------|-----------------|
| a) lower than | b) higher than  |
| c) equal to   | d) unrelated to |
- 10)** In arc welding is created between the electrode and work by
- |                             |                       |
|-----------------------------|-----------------------|
| a) Flow of current          | b) Voltage            |
| c) Material characteristics | d) Contact resistance |

Seat No.	
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Set	Q
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**  
**Joining Technologies for Metals**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instruction:** 1) Solve **any two** questions from **each** Section.  
 2) **Use** of scientific calculator is **allowed**.  
 3) Figures to **right** indicate **full** marks.  
 4) Assume additional **suitable** data **if necessary** and state it **clearly**.  
 5) Use university graph paper & semi-log paper if required.

**Section - I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain submerged arc welding.                         | <b>05</b> |
|            | <b>b)</b> Give comparison between TIG and MIG welding processes. | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain the effect of gases on Weld Properties.        | <b>05</b> |
|            | <b>b)</b> Classify Joining Process.                              | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Explain Welding parameters.                            | <b>05</b> |
|            | <b>b)</b> Explain Oxy Fuel Gas welding.                          | <b>05</b> |

**Section - II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What are the common aluminium welding defects?       | <b>05</b> |
|            | <b>b)</b> What is weld Thermal Cycle?                          | <b>05</b> |
| <b>Q.6</b> | <b>a)</b> Explain Solidification Cracking.                     | <b>05</b> |
|            | <b>b)</b> What is Haz Softening?                               | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Write a note on Residual stress in weld joint.       | <b>05</b> |
|            | <b>b)</b> Write a note on Fundamental of weldability of metal. | <b>05</b> |

Seat No.	
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Set	R
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Joining Technologies for Metals**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which of the following defects occur when the deposited metal is not focused on the root of weld?
 

a) Inclusion of slag	b) inadequate penetration
c) Incomplete fusion	d) Porosity
- 2) Following gases are used in tungsten inert gas welding
 

a) hydrogen and oxygen	b) CO <sub>2</sub> and H <sub>2</sub>
c) argon and neon	d) helium and neon
- 3) Which of the following welding process uses non-consumable electrodes
 

a) LASER welding	b) MIG welding
c) TIG welding	d) ion beam welding
- 4) The metal is solidified in the joint is called
 

a) Base metal	
b) Weld metal	
c) Creator	
d) Cold face	
- 5) TIG welding is best suited for welding
 

a) Mild steel	b) Stainless steel
c) Carbon steel	d) Aluminium
- 6) Welding process which generally not preferred for the joining of austenitic stainless steel is
 

a) Submerged arc welding	b) Shielded metal arc welding
c) Tungsten inert gas welding	d) Metal inert gas welding
- 7) Which of the following factor does not promote the solidification cracking?
 

a) metal under compression	
b) Lack of ferrite in austenitic stainless steel	
c) Incorrect filler in aluminum alloys	
d) none	
- 8) Preheating a low alloy steel prior to welding to minimize the risk of \_\_\_\_\_.
 

a) excessive distortion	b) porosity
c) weld cracking	d) Lack of fusion

- 9)** The temperature of a carburising flame in gas welding is \_\_\_\_\_ that of a neutral or Oxidizing flame.
- |               |                 |
|---------------|-----------------|
| a) lower than | b) higher than  |
| c) equal to   | d) unrelated to |
- 10)** In arc welding is created between the electrode and work by
- |                             |                       |
|-----------------------------|-----------------------|
| a) Flow of current          | b) Voltage            |
| c) Material characteristics | d) Contact resistance |

Seat No.	
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Set	R
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**  
**Joining Technologies for Metals**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instruction:** 1) Solve **any two** questions from **each** Section.  
2) **Use** of scientific calculator is **allowed**.  
3) Figures to **right** indicate **full** marks.  
4) Assume additional **suitable** data **if necessary** and state it **clearly**.  
5) Use university graph paper & semi-log paper if required.

**Section - I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain submerged arc welding.                         | <b>05</b> |
|            | <b>b)</b> Give comparison between TIG and MIG welding processes. | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain the effect of gases on Weld Properties.        | <b>05</b> |
|            | <b>b)</b> Classify Joining Process.                              | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Explain Welding parameters.                            | <b>05</b> |
|            | <b>b)</b> Explain Oxy Fuel Gas welding.                          | <b>05</b> |

**Section - II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What are the common aluminium welding defects?       | <b>05</b> |
|            | <b>b)</b> What is weld Thermal Cycle?                          | <b>05</b> |
| <b>Q.6</b> | <b>a)</b> Explain Solidification Cracking.                     | <b>05</b> |
|            | <b>b)</b> What is Haz Softening?                               | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Write a note on Residual stress in weld joint.       | <b>05</b> |
|            | <b>b)</b> Write a note on Fundamental of weldability of metal. | <b>05</b> |



Seat No.	
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Set	S
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Joining Technologies for Metals**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which of the following defects occur when the deposited metal is not focused on the root of weld?
 

a) Inclusion of slag	b) inadequate penetration
c) Incomplete fusion	d) Porosity
- 2) Following gases are used in tungsten inert gas welding
 

a) hydrogen and oxygen	b) CO <sub>2</sub> and H <sub>2</sub>
c) argon and neon	d) helium and neon
- 3) Which of the following welding process uses non-consumable electrodes
 

a) LASER welding	b) MIG welding
c) TIG welding	d) ion beam welding
- 4) The metal is solidified in the joint is called
 

a) Base metal	
b) Weld metal	
c) Creator	
d) Cold face	
- 5) TIG welding is best suited for welding
 

a) Mild steel	b) Stainless steel
c) Carbon steel	d) Aluminium
- 6) Welding process which generally not preferred for the joining of austenitic stainless steel is
 

a) Submerged arc welding	b) Shielded metal arc welding
c) Tungsten inert gas welding	d) Metal inert gas welding
- 7) Which of the following factor does not promote the solidification cracking?
 

a) metal under compression	
b) Lack of ferrite in austenitic stainless steel	
c) Incorrect filler in aluminum alloys	
d) none	
- 8) Preheating a low alloy steel prior to welding to minimize the risk of \_\_\_\_\_.
 

a) excessive distortion	b) porosity
c) weld cracking	d) Lack of fusion

- 9)** The temperature of a carburising flame in gas welding is \_\_\_\_\_ that of a neutral or Oxidizing flame.
- |               |                 |
|---------------|-----------------|
| a) lower than | b) higher than  |
| c) equal to   | d) unrelated to |
- 10)** In arc welding is created between the electrode and work by
- |                             |                       |
|-----------------------------|-----------------------|
| a) Flow of current          | b) Voltage            |
| c) Material characteristics | d) Contact resistance |

Seat No.	
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Set	S
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Joining Technologies for Metals**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instruction:** 1) Solve **any two** questions from **each** Section.  
 2) **Use** of scientific calculator is **allowed**.  
 3) Figures to **right** indicate **full** marks.  
 4) Assume additional **suitable** data **if necessary** and state it **clearly**.  
 5) Use university graph paper & semi-log paper if required.

**Section - I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Explain submerged arc welding.                         | <b>05</b> |
|            | <b>b)</b> Give comparison between TIG and MIG welding processes. | <b>05</b> |
| <b>Q.3</b> | <b>a)</b> Explain the effect of gases on Weld Properties.        | <b>05</b> |
|            | <b>b)</b> Classify Joining Process.                              | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> Explain Welding parameters.                            | <b>05</b> |
|            | <b>b)</b> Explain Oxy Fuel Gas welding.                          | <b>05</b> |

**Section - II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What are the common aluminium welding defects?       | <b>05</b> |
|            | <b>b)</b> What is weld Thermal Cycle?                          | <b>05</b> |
| <b>Q.6</b> | <b>a)</b> Explain Solidification Cracking.                     | <b>05</b> |
|            | <b>b)</b> What is Haz Softening?                               | <b>05</b> |
| <b>Q.7</b> | <b>a)</b> Write a note on Residual stress in weld joint.       | <b>05</b> |
|            | <b>b)</b> Write a note on Fundamental of weldability of metal. | <b>05</b> |

<b>Seat No.</b>	
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Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks: 10

10

- 1) A power cycle continuously converts \_\_\_\_\_ into \_\_\_\_\_.  
a) heat, heat                                      b) work, heat  
c) heat, work                                      d) work, work
- 2) The path followed in a vapour power cycle is \_\_\_\_\_.  
a) boiler-condenser-turbine-pump  
b) boiler-turbine-condenser-pump  
c) boiler-turbine-pump-condenser  
d) boiler-pump-turbine-condenser
- 3) Work output of turbine is \_\_\_\_\_ the work input to the pump.  
a) much larger                                      b) much smaller  
c) equal to    d) none of the mentioned
- 4) What is the use of reheat cycle in steam turbines?  
a) To remove the moisture from the steam  
b) To increase the steam temperature  
c) To increase steam pressure  
d) None of the mentioned
- 5) When boiler pressure is increased efficiency is \_\_\_\_\_.  
a) decreased                                        b) increased  
c) remains constant                                d) none of the mentioned
- 6) What does thermodynamic efficiency of steam turbine mean?  
a) Ratio of power developed to the power that can be developed by ideal turbine  
b) Ratio of power that can be developed by ideal turbine to the power developed by the actual turbine  
c) Ratio of inlet temperature to outlet temperature  
d) None of the mentioned
- 7) In a glass tube type water indicator for a boiler, one end of the tube is connected to water space and the other end is connected to \_\_\_\_\_.  
a) water space also                                b) chimney  
c) steam space                                      d) superheater

- 8) What is the function of a cooling tower in a power plant?
- a) It cools the hot water coming back from the condenser
  - b) It cools the hot water being supplied to the condenser
  - c) It heats the cold water coming back from the condenser
  - d) It heats the cold water being supplied to the condenser
- 9) Mechanical draft cooling tower size is \_\_\_\_\_ the size of the natural draft cooling tower.
- a) smaller than
  - b) larger than
  - c) equal to the
  - d) very much larger than
- 10) What is rotor steam turbine?
- a) Spinning component with wheels
  - b) Spinning component with wheels and blades disconnected
  - c) Spinning component with wheels and blades connected
  - d) Spinning component with blades

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Steam Power Engineering**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any two questions from each section.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2** Explain Reheat & Regenerative Vapour Power Cycle. **10**
- Q.3** Explain different Steam Cycles for nuclear power plant and also brief about low temperature power cycles. **10**
- Q.4** Differentiate between Fire tube and Water tube boilers. Also mention different Mountings and Accessories of a boiler. **10**

**Section – II**

- Q.5** What is mean by Compounding of turbine? Explain Pressure & velocity compounding of a turbine. **10**
- Q.6** Draw Velocity triangle of an Impulse turbine and explain various efficiencies of steam turbine. **10**
- Q.7** Giving significance of Cooling tower, explain hygrometry chart in brief. **10**

Seat No.	
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Set Q
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Steam Power Engineering**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) What does thermodynamic efficiency of steam turbine mean?
  - a) Ratio of power developed to the power that can be developed by ideal turbine
  - b) Ratio of power that can be developed by ideal turbine to the power developed by the actual turbine
  - c) Ratio of inlet temperature to outlet temperature
  - d) None of the mentioned
- 2) In a glass tube type water indicator for a boiler, one end of the tube is connected to water space and the other end is connected to \_\_\_\_\_.
  - a) water space also
  - b) chimney
  - c) steam space
  - d) superheater
- 3) What is the function of a cooling tower in a power plant?
  - a) It cools the hot water coming back from the condenser
  - b) It cools the hot water being supplied to the condenser
  - c) It heats the cold water coming back from the condenser
  - d) It heats the cold water being supplied to the condenser
- 4) Mechanical draft cooling tower size is \_\_\_\_\_ the size of the natural draft cooling tower.
  - a) smaller than
  - b) larger than
  - c) equal to the
  - d) very much larger than
- 5) What is rotor steam turbine?
  - a) Spinning component with wheels
  - b) Spinning component with wheels and blades disconnected
  - c) Spinning component with wheels and blades connected
  - d) Spinning component with blades
- 6) A power cycle continuously converts \_\_\_\_\_ into \_\_\_\_\_.
  - a) heat, heat
  - b) work, heat
  - c) heat, work
  - d) work, work

- 7) The path followed in a vapour power cycle is \_\_\_\_\_.
  - a) boiler-condenser-turbine-pump
  - b) boiler-turbine-condenser-pump
  - c) boiler-turbine-pump-condenser
  - d) boiler-pump-turbine-condenser
- 8) Work output of turbine is \_\_\_\_\_ the work input to the pump.
  - a) much larger
  - b) much smaller
  - c) equal to
  - d) none of the mentioned
- 9) What is the use of reheat cycle in steam turbines?
  - a) To remove the moisture from the steam
  - b) To increase the steam temperature
  - c) To increase steam pressure
  - d) None of the mentioned
- 10) When boiler pressure is increased efficiency is \_\_\_\_\_.
  - a) decreased
  - b) increased
  - c) remains constant
  - d) none of the mentioned



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Steam Power Engineering**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any two questions from each section.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2** Explain Reheat & Regenerative Vapour Power Cycle. **10**
- Q.3** Explain different Steam Cycles for nuclear power plant and also brief about low temperature power cycles. **10**
- Q.4** Differentiate between Fire tube and Water tube boilers. Also mention different Mountings and Accessories of a boiler. **10**

**Section – II**

- Q.5** What is mean by Compounding of turbine? Explain Pressure & velocity compounding of a turbine. **10**
- Q.6** Draw Velocity triangle of an Impulse turbine and explain various efficiencies of steam turbine. **10**
- Q.7** Giving significance of Cooling tower, explain hygrometry chart in brief. **10**

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Steam Power Engineering**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Mechanical draft cooling tower size is \_\_\_\_\_ the size of the natural draft cooling tower.
 

a) smaller than	b) larger than
c) equal to the	d) very much larger than
- 2) What is rotor steam turbine?
 

a) Spinning component with wheels
b) Spinning component with wheels and blades disconnected
c) Spinning component with wheels and blades connected
d) Spinning component with blades
- 3) A power cycle continuously converts \_\_\_\_\_ into \_\_\_\_\_.
 

a) heat, heat	b) work, heat
c) heat, work	d) work, work
- 4) The path followed in a vapour power cycle is \_\_\_\_\_.
 

a) boiler-condenser-turbine-pump
b) boiler-turbine-condenser-pump
c) boiler-turbine-pump-condenser
d) boiler-pump-turbine-condenser
- 5) Work output of turbine is \_\_\_\_\_ the work input to the pump.
 

a) much larger	b) much smaller
c) equal to	d) none of the mentioned
- 6) What is the use of reheat cycle in steam turbines?
 

a) To remove the moisture from the steam
b) To increase the steam temperature
c) To increase steam pressure
d) None of the mentioned
- 7) When boiler pressure is increased efficiency is \_\_\_\_\_.
 

a) decreased	b) increased
c) remains constant	d) none of the mentioned

- 8)** What does thermodynamic efficiency of steam turbine mean?
- a) Ratio of power developed to the power that can be developed by ideal turbine
  - b) Ratio of power that can be developed by ideal turbine to the power developed by the actual turbine
  - c) Ratio of inlet temperature to outlet temperature
  - d) None of the mentioned
- 9)** In a glass tube type water indicator for a boiler, one end of the tube is connected to water space and the other end is connected to \_\_\_\_.
- a) water space also
  - b) chimney
  - c) steam space
  - d) superheater
- 10)** What is the function of a cooling tower in a power plant?
- a) It cools the hot water coming back from the condenser
  - b) It cools the hot water being supplied to the condenser
  - c) It heats the cold water coming back from the condenser
  - d) It heats the cold water being supplied to the condenser

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Steam Power Engineering**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any two questions from each section.  
2) Figures to the right indicate full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | Explain Reheat & Regenerative Vapour Power Cycle.   | <b>10</b> |
| <b>Q.3</b> | Explain different Steam Cycles for nuclear power plant and also brief about low temperature power cycles.             | <b>10</b> |
| <b>Q.4</b> | Differentiate between Fire tube and Water tube boilers. Also mention different Mountings and Accessories of a boiler. | <b>10</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | What is mean by Compounding of turbine? Explain Pressure & velocity compounding of a turbine.   | <b>10</b> |
| <b>Q.6</b> | Draw Velocity triangle of an Impulse turbine and explain various efficiencies of steam turbine. | <b>10</b> |
| <b>Q.7</b> | Giving significance of Cooling tower, explain hygrometry chart in brief.                        | <b>10</b> |

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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Steam Power Engineering**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Work output of turbine is \_\_\_\_\_ the work input to the pump.
  - a) much larger
  - b) much smaller
  - c) equal to
  - d) none of the mentioned
- 2) What is the use of reheat cycle in steam turbines?
  - a) To remove the moisture from the steam
  - b) To increase the steam temperature
  - c) To increase steam pressure
  - d) None of the mentioned
- 3) When boiler pressure is increased efficiency is \_\_\_\_\_.
  - a) decreased
  - b) increased
  - c) remains constant
  - d) none of the mentioned
- 4) What does thermodynamic efficiency of steam turbine mean?
  - a) Ratio of power developed to the power that can be developed by ideal turbine
  - b) Ratio of power that can be developed by ideal turbine to the power developed by the actual turbine
  - c) Ratio of inlet temperature to outlet temperature
  - d) None of the mentioned
- 5) In a glass tube type water indicator for a boiler, one end of the tube is connected to water space and the other end is connected to \_\_\_\_\_.
  - a) water space also
  - b) chimney
  - c) steam space
  - d) superheater
- 6) What is the function of a cooling tower in a power plant?
  - a) It cools the hot water coming back from the condenser
  - b) It cools the hot water being supplied to the condenser
  - c) It heats the cold water coming back from the condenser
  - d) It heats the cold water being supplied to the condenser
- 7) Mechanical draft cooling tower size is \_\_\_\_\_ the size of the natural draft cooling tower.
  - a) smaller than
  - b) larger than
  - c) equal to the
  - d) very much larger than

- 8) What is rotor steam turbine?
  - a) Spinning component with wheels
  - b) Spinning component with wheels and blades disconnected
  - c) Spinning component with wheels and blades connected
  - d) Spinning component with blades
- 9) A power cycle continuously converts \_\_\_\_\_ into \_\_\_\_\_.
  - a) heat, heat
  - b) work, heat
  - c) heat, work
  - d) work, work
- 10) The path followed in a vapour power cycle is \_\_\_\_\_.
  - a) boiler-condenser-turbine-pump
  - b) boiler-turbine-condenser-pump
  - c) boiler-turbine-pump-condenser
  - d) boiler-pump-turbine-condenser

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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Steam Power Engineering**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any two questions from each section.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2** Explain Reheat & Regenerative Vapour Power Cycle. **10**
- Q.3** Explain different Steam Cycles for nuclear power plant and also brief about low temperature power cycles. **10**
- Q.4** Differentiate between Fire tube and Water tube boilers. Also mention different Mountings and Accessories of a boiler. **10**

**Section – II**

- Q.5** What is mean by Compounding of turbine? Explain Pressure & velocity compounding of a turbine. **10**
- Q.6** Draw Velocity triangle of an Impulse turbine and explain various efficiencies of steam turbine. **10**
- Q.7** Giving significance of Cooling tower, explain hygrometry chart in brief. **10**

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Set **P**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Refrigeration and Air Conditioning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Attempt any two questions from both sections.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 a)** Draw the P-V & T-S diagram for Bell Coleman cycle & with the help of it show that for Bell Coleman cycle **05**
- $$\text{COP} = \frac{1}{R_p^{\left(\frac{\gamma-1}{\gamma}\right)} - 1}$$
- Where  $R_p$  = pressure ratio
- b)** With schematic diagram and T-s plot explain Linde system for liquefaction of air. **05**
- c)** Explain Effect of change in evaporator & condenser pressure on COP of VCC. **04**
- Q.3 a)** Explain the various thermodynamic properties of refrigerants. **05**
- b)** A Carnot refrigeration cycle absorbs heat at 270K & rejects it at 300K. **05**
- 1) Calculate the COP of this refrigeration Cycle.
  - 2) If the cycle absorbing 1130 kJ/min at 270K, how many kJ of work is required per second?
  - 3) If the Carnot heat pump operates between the same temperatures as the above refrigeration cycle, what is the COP?
  - 4) How many kJ/min will heat pump deliver at 300K if it absorbs 1130 kJ/min at 270K?
- c)** Explain with the help of neat diagram Electrolux Refrigeration System. **04**
- Q.4 a)** The temperature limits of an ammonia refrigerating system are 25°C and -10°C. If the gas is dry at the end of compression, calculate the coefficient of performance of the cycle by assuming no under cooling of the liquid ammonia. Use the following table for the properties of ammonia. **05**

Temp. (°C)	Liquid Heat (kJ/kg)	Latent Heat (kJ/kg)	Liquid Entropy(kJ/kgK)
25	298.9	1166.94	1.1242
-10	135.37	1297.68	0.5443

- b)** Explain by flow diagram and on p-h diagram multiple evaporators at different temperature with individual compressor & individual expansion valve. **05**
- c)** Draw neat diagram of Regenerative air cooling system for air craft refrigeration and explain it with the help of its T-S diagram. **04**

**Section – II**

- Q.5 a)** A sample of moist air has DBT of 43°C & WBT of 29°C. Calculate the following without making use of psychrometric Chart. **05**
- 1) Partial Pressure of water vapour
  - 2) Specific Humidity
  - 3) Relative Humidity
  - 4) Dew Point Temperature
  - 5) Enthalpy
- b)** What are the different factors (load components) are considered in load estimation sheet for comfort application? **05**
- c)** Write down general rules in designing the duct. **04**
- Q.6 a)** Define GSHF, RSHF & ERSHF and show those lines on layout of psychrometric chart. **05**
- b)** Write a short note on types of fan used in air conditioning applications. **05**
- c)** Define the following. **04**
- 1) DPT
  - 2) Sp. Humidity
  - 3) Degree of Saturation
  - 4) Relative Humidity
- Q.7 a)** Develop an equation for equivalent diameter of circular duct for a rectangular duct when quantity of air passing through both the duct is same. **05**
- b)** An air conditioning system is to be designed for small office for winter conditions with following data: **05**
- Outdoor condition: 10°C DBT and 8°C WBT  
Required indoor condition: 20°C DBT and 60% RH  
Amount of air circulated: 0.3 m<sup>3</sup>/min/person  
Seating capacity of the office: 50 persons  
The required condition is achieved first by heating and then by adiabatic humidifying. Find the following:
- 1) Heating capacity of coil in kW and surface temperature if bypass factor is 0.32.
  - 2) Capacity of humidifier
- c)** Explain the factors affecting on Human Comfort. **04**

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Set **Q**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Refrigeration and Air Conditioning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Attempt any two questions from both sections.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 a)** Draw the P-V & T-S diagram for Bell Coleman cycle & with the help of it show that for Bell Coleman cycle **05**
- $$\text{COP} = \frac{1}{R_p^{\left(\frac{\gamma-1}{\gamma}\right)} - 1}$$
- Where  $R_p$  = pressure ratio
- b)** With schematic diagram and T-s plot explain Linde system for liquefaction of air. **05**
- c)** Explain Effect of change in evaporator & condenser pressure on COP of VCC. **04**
- Q.3 a)** Explain the various thermodynamic properties of refrigerants. **05**
- b)** A Carnot refrigeration cycle absorbs heat at 270K & rejects it at 300K. **05**
- 1) Calculate the COP of this refrigeration Cycle.
  - 2) If the cycle absorbing 1130 kJ/min at 270K, how many kJ of work is required per second?
  - 3) If the Carnot heat pump operates between the same temperatures as the above refrigeration cycle, what is the COP?
  - 4) How many kJ/min will heat pump deliver at 300K if it absorbs 1130 kJ/min at 270K?
- c)** Explain with the help of neat diagram Electrolux Refrigeration System. **04**
- Q.4 a)** The temperature limits of an ammonia refrigerating system are 25°C and -10°C. If the gas is dry at the end of compression, calculate the coefficient of performance of the cycle by assuming no under cooling of the liquid ammonia. Use the following table for the properties of ammonia. **05**

Temp. (°C)	Liquid Heat (kJ/kg)	Latent Heat (kJ/kg)	Liquid Entropy(kJ/kgK)
25	298.9	1166.94	1.1242
-10	135.37	1297.68	0.5443

- b)** Explain by flow diagram and on p-h diagram multiple evaporators at different temperature with individual compressor & individual expansion valve. **05**
- c)** Draw neat diagram of Regenerative air cooling system for air craft refrigeration and explain it with the help of its T-S diagram. **04**

**Section – II**

- Q.5**   **a)**   A sample of moist air has DBT of 43°C & WBT of 29°C. Calculate the following without making use of psychrometric Chart. **05**
- 1)   Partial Pressure of water vapour
  - 2)   Specific Humidity
  - 3)   Relative Humidity
  - 4)   Dew Point Temperature
  - 5)   Enthalpy
- b)**   What are the different factors (load components) are considered in load estimation sheet for comfort application? **05**
- c)**   Write down general rules in designing the duct. **04**
- 
- Q.6**   **a)**   Define GSHF, RSHF & ERSHF and show those lines on layout of psychrometric chart. **05**
- b)**   Write a short note on types of fan used in air conditioning applications. **05**
- c)**   Define the following. **04**
- 1)   DPT
  - 2)   Sp. Humidity
  - 3)   Degree of Saturation
  - 4)   Relative Humidity
- 
- Q.7**   **a)**   Develop an equation for equivalent diameter of circular duct for a rectangular duct when quantity of air passing through both the duct is same. **05**
- b)**   An air conditioning system is to be designed for small office for winter conditions with following data: **05**
- Outdoor condition: 10°C DBT and 8°C WBT
- Required indoor condition: 20°C DBT and 60% RH
- Amount of air circulated: 0.3 m<sup>3</sup>/min/person
- Seating capacity of the office: 50 persons
- The required condition is achieved first by heating and then by adiabatic humidifying. Find the following:
- 1)   Heating capacity of coil in kW and surface temperature if bypass factor is 0.32.
  - 2)   Capacity of humidifier
- c)**   Explain the factors affecting on Human Comfort. **04**

Seat No.	
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Set 

R
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Refrigeration and Air Conditioning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Assume suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) The conditioned air supplied to a room must have capacity to take \_\_\_\_\_.  
 a) Sensible Heat Load  
 b) Both Sensible & Latent Heat Load  
 c) Latent Heat Load  
 d) None of Above
- 2) The Duct is made of \_\_\_\_\_.  
 a) Galvanized Iron  
 b) Fibre Glass  
 c) Aluminum  
 d) Any one of these
- 3) Equivalent length ( $L_e$ ) for calculation of dynamic pressure loss is given by equation \_\_\_\_\_.  
 a)  $\frac{f}{cm}$   
 b)  $\frac{fc}{m}$   
 c)  $\frac{fm}{c}$   
 d)  $\frac{cm}{f}$
- 4) The degree of warmth or cold felt by a human body depends mainly on \_\_\_\_\_.  
 a) dry bulb temperature  
 b) air velocity  
 c) relative humidity  
 d) all of Above
- 5) Below is the main component of refrigeration system EXCEPT: \_\_\_\_\_.  
 a) Compressor  
 b) Condenser  
 c) Evaporator  
 d) Pump
- 6) Which type of air cooling system is used for transportation?  
 a) Regenerative air cooling system  
 b) Boot strap air cooling system  
 c) Reduced ambient air cooling system  
 d) None of above
- 7) Inorganic compounds are \_\_\_\_\_.  
 a) 500 series  
 b) 700 series  
 c) 200 series  
 d) 1000 series





Seat No.	
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Set **R**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Refrigeration and Air Conditioning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Attempt any two questions from both sections.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 a)** Draw the P-V & T-S diagram for Bell Coleman cycle & with the help of it show that for Bell Coleman cycle **05**
- $$\text{COP} = \frac{1}{R_p^{\left(\frac{\gamma-1}{\gamma}\right)} - 1}$$
- Where  $R_p$  = pressure ratio
- b)** With schematic diagram and T-s plot explain Linde system for liquefaction of air. **05**
- c)** Explain Effect of change in evaporator & condenser pressure on COP of VCC. **04**
- Q.3 a)** Explain the various thermodynamic properties of refrigerants. **05**
- b)** A Carnot refrigeration cycle absorbs heat at 270K & rejects it at 300K. **05**
- 1) Calculate the COP of this refrigeration Cycle.
  - 2) If the cycle absorbing 1130 kJ/min at 270K, how many kJ of work is required per second?
  - 3) If the Carnot heat pump operates between the same temperatures as the above refrigeration cycle, what is the COP?
  - 4) How many kJ/min will heat pump deliver at 300K if it absorbs 1130 kJ/min at 270K?
- c)** Explain with the help of neat diagram Electrolux Refrigeration System. **04**
- Q.4 a)** The temperature limits of an ammonia refrigerating system are 25°C and -10°C. If the gas is dry at the end of compression, calculate the coefficient of performance of the cycle by assuming no under cooling of the liquid ammonia. Use the following table for the properties of ammonia. **05**

Temp. (°C)	Liquid Heat (kJ/kg)	Latent Heat (kJ/kg)	Liquid Entropy(kJ/kgK)
25	298.9	1166.94	1.1242
-10	135.37	1297.68	0.5443

- b)** Explain by flow diagram and on p-h diagram multiple evaporators at different temperature with individual compressor & individual expansion valve. **05**
- c)** Draw neat diagram of Regenerative air cooling system for air craft refrigeration and explain it with the help of its T-S diagram. **04**

**Section – II**

- Q.5**   **a)**   A sample of moist air has DBT of 43°C & WBT of 29°C. Calculate the following without making use of psychrometric Chart. **05**
- 1)   Partial Pressure of water vapour
  - 2)   Specific Humidity
  - 3)   Relative Humidity
  - 4)   Dew Point Temperature
  - 5)   Enthalpy
- b)**   What are the different factors (load components) are considered in load estimation sheet for comfort application? **05**
- c)**   Write down general rules in designing the duct. **04**
- Q.6**   **a)**   Define GSHF, RSHF & ERSHF and show those lines on layout of psychrometric chart. **05**
- b)**   Write a short note on types of fan used in air conditioning applications. **05**
- c)**   Define the following. **04**
- 1)   DPT
  - 2)   Sp. Humidity
  - 3)   Degree of Saturation
  - 4)   Relative Humidity
- Q.7**   **a)**   Develop an equation for equivalent diameter of circular duct for a rectangular duct when quantity of air passing through both the duct is same. **05**
- b)**   An air conditioning system is to be designed for small office for winter conditions with following data: **05**
- Outdoor condition: 10°C DBT and 8°C WBT  
Required indoor condition: 20°C DBT and 60% RH  
Amount of air circulated: 0.3 m<sup>3</sup>/min/person  
Seating capacity of the office: 50 persons  
The required condition is achieved first by heating and then by adiabatic humidifying. Find the following:
- 1)   Heating capacity of coil in kW and surface temperature if bypass factor is 0.32.
  - 2)   Capacity of humidifier
- c)**   Explain the factors affecting on Human Comfort. **04**

Seat No.	
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Set **S**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Refrigeration and Air Conditioning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Assume suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In aqua-ammonia and Lithium-bromide vapour absorption refrigeration systems, the refrigerants are respectively \_\_\_\_\_.  
 a) Water and Water  
 b) Ammonia and Water  
 c) Water and Lithium bromide  
 d) Ammonia and Lithium bromide
- 2) In a compound compression refrigeration system, the compression of refrigerant is carried out in \_\_\_\_\_ compressor.  
 a) Single  
 b) Zero  
 c) Multiple  
 d) All of above
- 3) When BPF of the cooling coil is 0.3, then its efficiency will be \_\_\_\_\_.  
 a) 0.5  
 b) 1  
 c) 0.7  
 d) 0.3
- 4) The humidification process on the psychrometric chart is shown by \_\_\_\_\_.  
 a) Horizontal line  
 b) Vertical line  
 c) Inclined line  
 d) Curved line
- 5) For the air  $DBT = WBT = 20^{\circ}C$ , Then effective temperature will be \_\_\_\_\_.  
 a) Equal to  $20^{\circ}C$   
 b) Less than  $20^{\circ}C$   
 c) Greater than  $20^{\circ}C$   
 d) Unpredictable
- 6) The conditioned air supplied to a room must have capacity to take \_\_\_\_\_.  
 a) Sensible Heat Load  
 b) Both Sensible & Latent Heat Load  
 c) Latent Heat Load  
 d) None of Above
- 7) The Duct is made of \_\_\_\_\_.  
 a) Galvanized Iron  
 b) Fibre Glass  
 c) Aluminum  
 d) Any one of these

- 8) Equivalent length ( $L_e$ ) for calculation of dynamic pressure loss is given by equation \_\_\_\_\_.  
a)  $\frac{f}{cm}$  b)  $\frac{fc}{m}$   
c)  $\frac{fm}{c}$  d)  $\frac{cm}{f}$
- 9) The degree of warmth or cold felt by a human body depends mainly on \_\_\_\_\_.  
a) dry bulb temperature b) air velocity  
c) relative humidity d) all of Above
- 10) Below is the main component of refrigeration system EXCEPT: \_\_\_\_\_.  
a) Compressor b) Condenser  
c) Evaporator d) Pump
- 11) Which type of air cooling system is used for transportation?  
a) Regenerative air cooling system  
b) Boot strap air cooling system  
c) Reduced ambient air cooling system  
d) None of above
- 12) Inorganic compounds are \_\_\_\_\_.  
a) 500 series b) 700 series  
c) 200 series d) 1000 series
- 13) For the refrigerant R134a, 'a' stands for: \_\_\_\_\_.  
a) Isomers b) Isotopes  
c) Epimers d) Polymers
- 14) When the lower temperature of a refrigerating machine is fixed, then the coefficient of performance of reversed Carnot cycle can be improved by \_\_\_\_\_.  
a) Operating the machine at higher speeds  
b) Operating the machine at lower speeds  
c) Raising the higher temperature  
d) Lowering the higher temperature

Seat No.	
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Set **S**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Refrigeration and Air Conditioning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Attempt any two questions from both sections.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 a)** Draw the P-V & T-S diagram for Bell Coleman cycle & with the help of it show that for Bell Coleman cycle **05**
- $$\text{COP} = \frac{1}{R_p^{\left(\frac{\gamma-1}{\gamma}\right)} - 1}$$
- Where  $R_p$  = pressure ratio
- b)** With schematic diagram and T-s plot explain Linde system for liquefaction of air. **05**
- c)** Explain Effect of change in evaporator & condenser pressure on COP of VCC. **04**
- Q.3 a)** Explain the various thermodynamic properties of refrigerants. **05**
- b)** A Carnot refrigeration cycle absorbs heat at 270K & rejects it at 300K. **05**
- 1) Calculate the COP of this refrigeration Cycle.
  - 2) If the cycle absorbing 1130 kJ/min at 270K, how many kJ of work is required per second?
  - 3) If the Carnot heat pump operates between the same temperatures as the above refrigeration cycle, what is the COP?
  - 4) How many kJ/min will heat pump deliver at 300K if it absorbs 1130 kJ/min at 270K?
- c)** Explain with the help of neat diagram Electrolux Refrigeration System. **04**
- Q.4 a)** The temperature limits of an ammonia refrigerating system are 25°C and -10°C. If the gas is dry at the end of compression, calculate the coefficient of performance of the cycle by assuming no under cooling of the liquid ammonia. Use the following table for the properties of ammonia. **05**

Temp. (°C)	Liquid Heat (kJ/kg)	Latent Heat (kJ/kg)	Liquid Entropy(kJ/kgK)
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-10	135.37	1297.68	0.5443

- b)** Explain by flow diagram and on p-h diagram multiple evaporators at different temperature with individual compressor & individual expansion valve. **05**
- c)** Draw neat diagram of Regenerative air cooling system for air craft refrigeration and explain it with the help of its T-S diagram. **04**

**Section – II**

- Q.5 a)** A sample of moist air has DBT of 43°C & WBT of 29°C. Calculate the following without making use of psychrometric Chart. **05**
- 1) Partial Pressure of water vapour
  - 2) Specific Humidity
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  - 5) Enthalpy
- b)** What are the different factors (load components) are considered in load estimation sheet for comfort application? **05**
- c)** Write down general rules in designing the duct. **04**
- Q.6 a)** Define GSHF, RSHF & ERSHF and show those lines on layout of psychrometric chart. **05**
- b)** Write a short note on types of fan used in air conditioning applications. **05**
- c)** Define the following. **04**
- 1) DPT
  - 2) Sp. Humidity
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- Q.7 a)** Develop an equation for equivalent diameter of circular duct for a rectangular duct when quantity of air passing through both the duct is same. **05**
- b)** An air conditioning system is to be designed for small office for winter conditions with following data: **05**
- Outdoor condition: 10°C DBT and 8°C WBT  
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Amount of air circulated: 0.3 m<sup>3</sup>/min/person  
Seating capacity of the office: 50 persons  
The required condition is achieved first by heating and then by adiabatic humidifying. Find the following:
- 1) Heating capacity of coil in kW and surface temperature if bypass factor is 0.32.
  - 2) Capacity of humidifier
- c)** Explain the factors affecting on Human Comfort. **04**

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**Fourth Y. (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Automobile Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 4) Assume suitable data wherever needed and mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) Which of the following statements regarding four-wheel drive is correct?
  - a) All the four wheels are powered
  - b) All the four wheels can be steered
  - c) Vehicle has four wheels
  - d) None of the above
- 2) The number of points at which the engine - clutch-gear box unit is supported on the chassis frame is \_\_\_\_\_.
  - a) one
  - b) two
  - c) three
  - d) four
- 3) \_\_\_\_\_ is the resistance offered by air to the movement of a vehicle.
  - a) air resistance
  - b) grade resistance
  - c) rolling resistance
  - d) total resistance
- 4) The ability of the rear wheels to transmit tractive effort without slipping is known as \_\_\_\_\_.
  - a) pull
  - b) push
  - c) torque
  - d) traction
- 5) The inertia of the rotating parts of the clutch should be \_\_\_\_\_.
  - a) zero
  - b) minimum
  - c) maximum
  - d) none of these
- 6) The component of the torque converter that allows multiplication of torque is the \_\_\_\_\_.
  - a) turbine
  - b) impeller
  - c) pump
  - d) stator
- 7) By using synchronizing device, the two involved adjacent gears have their speeds \_\_\_\_\_.
  - a) increased
  - b) reduced
  - c) equalized
  - d) un-equalized
- 8) Most popular manual steering gear for cars today is \_\_\_\_\_.
  - a) worm and wheel type
  - b) rack and pinion type
  - c) cam and roller type
  - d) worm and nut type



- 9) One purpose of a recirculating ball type steering gear is to reduce the \_\_\_\_\_.  
a) operating friction                      b) operating cost  
c) toe-out during- turns                d) number of parts
- 10) The function of master cylinder is \_\_\_\_\_.  
a) to decrease pressure unequally in all cylinders  
b) to increase pressure unequally in all cylinders  
c) to increase pressure equally in all cylinders  
d) to decrease power equally in all cylinders
- 11) Air brakes are mostly used in case of \_\_\_\_\_.  
a) cars    b) trucks  
c) jeeps                                        d) three-wheelers
- 12) The MacPherson system consists of a \_\_\_\_\_.  
a) diagonal stay                            b) a single arm  
c) telescopic strut                         d) all above
- 13) The components suspension systems are: \_\_\_\_\_.  
a) springs  
b) dampers or shock absorbers  
c) stabilizer and a linkage system  
d) all of these
- 14) A Fuel Cell is an electrochemical device that combines \_\_\_\_\_ and \_\_\_\_\_ to produce electricity, with water and heat as its by-product.  
a) Hydrogen and Water                      b) Hydrogen and Oxygen  
c) a and b                                        d) none of these

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**Fourth Y. (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Automobile Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data if necessary.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Explain in detail the front engine front wheel drive arrangement with a neat sketch and write its advantages and disadvantages. **06**
- b) Define the following.** **04**
- 1) Chassis
  - 2) Draw bar pull
  - 3) Gradient resistance
  - 4) Tractive effort
- c)** Explain single plate clutch with neat sketch. **04**
- Q.3 a)** The coefficient of rolling resistance weighing 62293.5 N is 0.018 and coefficient of air resistance is 0.0276 in the formula  $R = KW + KaAV^2$  in N. Where, A is  $m^2$  of the frontal area and V is the speed in km/h. The transmission efficiency in top gear of 6.2: 1 is 90 % and in the second gear of 15:1 is 80 %. The frontal area is 5.574  $m^2$ . If the truck has to have a maximum speed of 88 km/h in the top gear, calculate **10**
- (i) The engine brake power required
  - (ii) The engine speed if the driving wheels have an effective diameter of 0.8125 m
  - (iii) The maximum grade the truck can negotiate at the above engine speed in second gear and
  - (iv) The maximum drawbar pull available on the level at the above engine speed in second gear.
- b)** Describe fluid clutch with neat sketch. **04**
- Q.4 a)** Explain synchromesh gear box with neat sketch of synchronizer unit and also describe its advantages over other type of gear boxes. **06**
- b) Write short note on the following.** **08**
- 1) Electric fuel gauge
  - 2) Electric horn

## Section – II

- Q.5**
- a) What are the functions of a steering system? Explain worm and worm wheel steering gear box. **06**
  - b) **Define the following.** **04**
    - 1) Camber
    - 2) Caster
    - 3) King pin inclination
    - 4) Included angle
  - c) **Write short note. (Any One)** **04**
    - 1) Disc brake
    - 2) Anti-lock Braking System (ABS)
- Q.6**
- a) A vehicle has its wheel base equal to 3 times the height of its C.G. above ground. If the vehicle is braked on all four wheels over a road adhesion factor of 0.6, determine the weight transfer from the rear to the front wheels. **06**
  - b) Explain airbrake system. **04**
  - c) **Write short note (Any One)** **04**
    - 1) Power steering
    - 2) Under steer & over steer
- Q.7**
- a) What are the functions and purpose of the suspension system? Differentiate independent and conventional suspension systems. **06**
  - b) Explain with neat sketch shock absorber. **04**
  - c) **Write short note (Any One)** **04**
    - 1) Hotch-kiss and Torque tube drive
    - 2) Electronic Control Unit

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Set Q
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**Fourth Y. (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Automobile Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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 5) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Most popular manual steering gear for cars today is \_\_\_\_\_.  
 a) worm and wheel type                      b) rack and pinion type  
 c) cam and roller type                      d) worm and nut type
- 2) One purpose of a recirculating ball type steering gear is to reduce the \_\_\_\_\_.  
 a) operating friction                      b) operating cost  
 c) toe-out during- turns                      d) number of parts
- 3) The function of master cylinder is \_\_\_\_\_.  
 a) to decrease pressure unequally in all cylinders  
 b) to increase pressure unequally in all cylinders  
 c) to increase pressure equally in all cylinders  
 d) to decrease power equally in all cylinders
- 4) Air brakes are mostly used in case of \_\_\_\_\_.  
 a) cars                      b) trucks  
 c) jeeps                      d) three-wheelers
- 5) The MacPherson system consists of a \_\_\_\_\_.  
 a) diagonal stay                      b) a single arm  
 c) telescopic strut                      d) all above
- 6) The components suspension systems are: \_\_\_\_\_.  
 a) springs  
 b) dampers or shock absorbers  
 c) stabilizer and a linkage system  
 d) all of these
- 7) A Fuel Cell is an electrochemical device that combines \_\_\_\_\_ and \_\_\_\_\_ to produce electricity, with water and heat as its by-product.  
 a) Hydrogen and Water                      b) Hydrogen and Oxygen  
 c) a and b                      d) none of these

- 8) Which of the following statements regarding four-wheel drive is correct?
- a) All the four wheels are powered
  - b) All the four wheels can be steered
  - c) Vehicle has four wheels
  - d) None of the above
- 9) The number of points at which the engine - clutch-gear box unit is supported on the chassis frame is \_\_\_\_.
- a) one
  - b) two
  - c) three
  - d) four
- 10) \_\_\_\_ is the resistance offered by air to the movement of a vehicle.
- a) air resistance
  - b) grade resistance
  - c) rolling resistance
  - d) total resistance
- 11) The ability of the rear wheels to transmit tractive effort without slipping is known as \_\_\_\_.
- a) pull
  - b) push
  - c) torque
  - d) traction
- 12) The inertia of the rotating parts of the clutch should be \_\_\_\_.
- a) zero
  - b) minimum
  - c) maximum
  - d) none of these
- 13) The component of the torque converter that allows multiplication of torque is the \_\_\_\_.
- a) turbine
  - b) impeller
  - c) pump
  - d) stator
- 14) By using synchronizing device, the two involved adjacent gears have their speeds \_\_\_\_.
- a) increased
  - b) reduced
  - c) equalized
  - d) un-equalized

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**Fourth Y. (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Automobile Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicates full marks  
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 4) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Explain in detail the front engine front wheel drive arrangement with a neat sketch and write its advantages and disadvantages. **06**
- b) Define the following.** **04**
- 1) Chassis
  - 2) Draw bar pull
  - 3) Gradient resistance
  - 4) Tractive effort
- c)** Explain single plate clutch with neat sketch. **04**
- Q.3 a)** The coefficient of rolling resistance weighing 62293.5 N is 0.018 and coefficient of air resistance is 0.0276 in the formula  $R = KW + KaAV^2$  in N. Where, A is  $m^2$  of the frontal area and V is the speed in km/h. The transmission efficiency in top gear of 6.2: 1 is 90 % and in the second gear of 15:1 is 80 %. The frontal area is 5.574  $m^2$ . If the truck has to have a maximum speed of 88 km/h in the top gear, calculate **10**
- (i) The engine brake power required
  - (ii) The engine speed if the driving wheels have an effective diameter of 0.8125 m
  - (iii) The maximum grade the truck can negotiate at the above engine speed in second gear and
  - (iv) The maximum drawbar pull available on the level at the above engine speed in second gear.
- b)** Describe fluid clutch with neat sketch. **04**
- Q.4 a)** Explain synchromesh gear box with neat sketch of synchronizer unit and also describe its advantages over other type of gear boxes. **06**
- b) Write short note on the following.** **08**
- 1) Electric fuel gauge
  - 2) Electric horn

## Section – II

- Q.5**
- a) What are the functions of a steering system? Explain worm and worm wheel steering gear box. **06**
  - b) **Define the following.** **04**
    - 1) Camber
    - 2) Caster
    - 3) King pin inclination
    - 4) Included angle
  - c) **Write short note. (Any One)** **04**
    - 1) Disc brake
    - 2) Anti-lock Braking System (ABS)
- Q.6**
- a) A vehicle has its wheel base equal to 3 times the height of its C.G. above ground. If the vehicle is braked on all four wheels over a road adhesion factor of 0.6, determine the weight transfer from the rear to the front wheels. **06**
  - b) Explain airbrake system. **04**
  - c) **Write short note (Any One)** **04**
    - 1) Power steering
    - 2) Under steer & over steer
- Q.7**
- a) What are the functions and purpose of the suspension system? Differentiate independent and conventional suspension systems. **06**
  - b) Explain with neat sketch shock absorber. **04**
  - c) **Write short note (Any One)** **04**
    - 1) Hotch-kiss and Torque tube drive
    - 2) Electronic Control Unit

<b>Seat No.</b>	
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- 8) The ability of the rear wheels to transmit tractive effort without slipping is known as \_\_\_\_\_.  
a) pull  
b) push  
c) torque  
d) traction
- 9) The inertia of the rotating parts of the clutch should be \_\_\_\_\_.  
a) zero  
b) minimum  
c) maximum  
d) none of these
- 10) The component of the torque converter that allows multiplication of torque is the \_\_\_\_\_.  
a) turbine  
b) impeller  
c) pump  
d) stator
- 11) By using synchronizing device, the two involved adjacent gears have their speeds \_\_\_\_\_.  
a) increased  
b) reduced  
c) equalized  
d) un-equalized
- 12) Most popular manual steering gear for cars today is \_\_\_\_\_.  
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a) operating friction  
b) operating cost  
c) toe-out during- turns  
d) number of parts
- 14) The function of master cylinder is \_\_\_\_\_.  
a) to decrease pressure unequally in all cylinders  
b) to increase pressure unequally in all cylinders  
c) to increase pressure equally in all cylinders  
d) to decrease power equally in all cylinders

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**Fourth Y. (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Automobile Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from each section.  
 2) Figures to the right indicates full marks  
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**Section – I**

- Q.2 a)** Explain in detail the front engine front wheel drive arrangement with a neat sketch and write its advantages and disadvantages. **06**
- b) Define the following.** **04**
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  - 4) Tractive effort
- c)** Explain single plate clutch with neat sketch. **04**
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- (i) The engine brake power required
  - (ii) The engine speed if the driving wheels have an effective diameter of 0.8125 m
  - (iii) The maximum grade the truck can negotiate at the above engine speed in second gear and
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- b)** Describe fluid clutch with neat sketch. **04**
- Q.4 a)** Explain synchromesh gear box with neat sketch of synchronizer unit and also describe its advantages over other type of gear boxes. **06**
- b) Write short note on the following.** **08**
- 1) Electric fuel gauge
  - 2) Electric horn

## Section – II

- Q.5**
- a)** What are the functions of a steering system? Explain worm and worm wheel steering gear box. **06**
  - b) Define the following.** **04**
    - 1) Camber
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    - 4) Included angle
  - c) Write short note. (Any One)** **04**
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- a)** A vehicle has its wheel base equal to 3 times the height of its C.G. above ground. If the vehicle is braked on all four wheels over a road adhesion factor of 0.6, determine the weight transfer from the rear to the front wheels. **06**
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  - c) Write short note (Any One)** **04**
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    - 2) Under steer & over steer
- Q.7**
- a)** What are the functions and purpose of the suspension system? Differentiate independent and conventional suspension systems. **06**
  - b)** Explain with neat sketch shock absorber. **04**
  - c) Write short note (Any One)** **04**
    - 1) Hotch-kiss and Torque tube drive
    - 2) Electronic Control Unit

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Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

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Marks: 14

14

- Page 13 of 16

- 9) A Fuel Cell is an electrochemical device that combines \_\_\_\_\_ and \_\_\_\_\_ to produce electricity, with water and heat as its by-product.
- a) Hydrogen and Water
  - b) Hydrogen and Oxygen
  - c) a and b
  - d) none of these
- 10) Which of the following statements regarding four-wheel drive is correct?
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- a) air resistance
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- 13) The ability of the rear wheels to transmit tractive effort without slipping is known as \_\_\_\_\_.
- a) pull
  - b) push
  - c) torque
  - d) traction
- 14) The inertia of the rotating parts of the clutch should be \_\_\_\_\_.
- a) zero
  - b) minimum
  - c) maximum
  - d) none of these

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**Fourth Y. (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Automobile Engineering**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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**Section – I**

- Q.2 a)** Explain in detail the front engine front wheel drive arrangement with a neat sketch and write its advantages and disadvantages. **06**
- b) Define the following.** **04**
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  - 4) Tractive effort
- c)** Explain single plate clutch with neat sketch. **04**
- Q.3 a)** The coefficient of rolling resistance weighing 62293.5 N is 0.018 and coefficient of air resistance is 0.0276 in the formula  $R = KW + KaAV^2$  in N. Where, A is  $m^2$  of the frontal area and V is the speed in km/h. The transmission efficiency in top gear of 6.2: 1 is 90 % and in the second gear of 15:1 is 80 %. The frontal area is 5.574  $m^2$ . If the truck has to have a maximum speed of 88 km/h in the top gear, calculate **10**
- (i) The engine brake power required
  - (ii) The engine speed if the driving wheels have an effective diameter of 0.8125 m
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- b)** Describe fluid clutch with neat sketch. **04**
- Q.4 a)** Explain synchromesh gear box with neat sketch of synchronizer unit and also describe its advantages over other type of gear boxes. **06**
- b) Write short note on the following.** **08**
- 1) Electric fuel gauge
  - 2) Electric horn

## Section – II

- Q.5**
- a) What are the functions of a steering system? Explain worm and worm wheel steering gear box. **06**
  - b) **Define the following.** **04**
    - 1) Camber
    - 2) Caster
    - 3) King pin inclination
    - 4) Included angle
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- a) A vehicle has its wheel base equal to 3 times the height of its C.G. above ground. If the vehicle is braked on all four wheels over a road adhesion factor of 0.6, determine the weight transfer from the rear to the front wheels. **06**
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  - c) **Write short note (Any One)** **04**
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- Q.7**
- a) What are the functions and purpose of the suspension system? Differentiate independent and conventional suspension systems. **06**
  - b) Explain with neat sketch shock absorber. **04**
  - c) **Write short note (Any One)** **04**
    - 1) Hotch-kiss and Torque tube drive
    - 2) Electronic Control Unit

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Robotics and Artificial Intelligence**

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page

Marks: 14

- 1) The main function of the robot is \_\_\_\_\_.
  - a) Sensing the environment by external sensor
  - b) Decision making
  - c) Performing
  - d) all
- 2) A 3D object in 3D space has got \_\_\_\_\_ degree/s of freedom.
  - a) 1
  - b) 5
  - c) 6
  - d) 4
- 3) Which of the following is a robot specification?
  - a) Control wrist
  - b) payload
  - c) robot energy
  - d) None of this
- 4) DC motors that are used in closed loop position control are called \_\_\_\_\_ motors.
  - a) Synchronous
  - b) Steeper
  - c) Brushless
  - d) Servo motors
- 5) A smart sensor can do which of the following?
  - a) Compensate for random errors
  - b) Automatic calibration of accuracy
  - c) Adjust for non linearities
  - d) all of the above
- 6) The most widely used technique of control for industrial robots is \_\_\_\_\_ control.
  - a) PI
  - b) PD
  - c) PID
  - d) ID
- 7) The process of finding the position of the end effector when the joint variable are know is called \_\_\_\_\_.
  - a) Forward Kinematics
  - b) Inverse Kinematics
  - c) Forward Dynamics
  - d) Inverse Dynamics



- 8) Artificial Intelligence is a technique which enables machines to \_\_\_\_\_ human behaviour.

a) Mimic	b) Ignore
c) Forget	d) None of the above
- 9) The \_\_\_\_\_ search generates all nodes at a particular level before proceeding to the next level of the tree.

a) Breadth First	b) Depth First
c) Hill Climbing	d) Production Systems
- 10) \_\_\_\_\_ are viewed as 'rules of thumb' that domain experts could use to generate good solutions without exhaustive search (rule-based expert systems).

a) Heuristics	b) Nodes
c) Production Systems	d) Exhaustive Search
- 11) Who is called the father of fuzzy logic?

a) Lotfi Zadeh	b) Plato
c) George Boole	d) Aristotle
- 12) The simplest form of neural networks where input data travels in one direction only, passing through artificial neural nodes and exiting through output nodes is called \_\_\_\_\_.

a) Feed Forward ANN	b) Recurrent ANN
c) Gated Recurrent ANN	d) None of the above
- 13) The two most commonly used technologies for imaging sensors are \_\_\_\_\_.

a) RGB and HSV	b) CDD and CMOS
c) RGB and CIE	d) CCD and CMOS
- 14) Imaging sensors in \_\_\_\_\_ cameras have both length and breadth.

a) Volume scan	b) Area Scan
c) Line Scan	d) Perimeter

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**Set****P**

**Fourth Year (B.Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Robotics and Artificial Intelligence**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Attempt any two questions from each Section.  
2) Figures to the right indicates full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain major components of an industrial robot.                                  | <b>07</b> |
|            | <b>b)</b> Give classification of industrial robots.   | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain inductive and capacitive type of proximity sensors used in robots.        | <b>07</b> |
|            | <b>b)</b> Explain hydraulic actuators used in robots with their advantages and limitations. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain various end effectors used in industrial robots.                          | <b>07</b> |
|            | <b>b)</b> Explain forward kinematics for 2 DOF Planar Manipulator with suitable diagram.    | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain depth first and breadth first search techniques used in AI with example.                              | <b>07</b> |
|            | <b>b)</b> Explain Hill Climbing Method used in AI with diagrams.  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain Components of Fuzzy Logic Systems Architecture.   | <b>07</b> |
|            | <b>b)</b> Explain Artificial Neural Network with example.   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Explain various applications of Machine Vision Systems. What are advantages of using a Machine Vision System? | <b>07</b> |
|            | <b>b)</b> Explain CCD and CMOS sensors used in Machine Vision Systems.  | <b>07</b> |

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Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page

Marks: 14

1) Artificial Intelligence is a technique which enables machines to \_\_\_\_\_ human behaviour.

- a) Mimic                      b) Ignore  
c) Forget                    d) None of the above

2) The \_\_\_\_\_ search generates all nodes at a particular level before proceeding to the next level of the tree.

- a) Breadth First                      b) Depth First  
c) Hill Climbing                      d) Production Systems

3) \_\_\_\_\_ are viewed as 'rules of thumb' that domain experts could use to generate good solutions without exhaustive search (rule-based expert systems).

- a) Heuristics                      b) Nodes  
c) Production Systems        d) Exhaustive Search

**4)** Who is called the father of fuzzy logic?

- a) Lotfi Zadeh                      b) Plato  
c) George Boole                  d) Aristotle

5) The simplest form of neural networks where input data travels in one direction only, passing through artificial neural nodes and exiting through output nodes is called \_\_\_\_\_.

- a) Feed Forward ANN                      b) Recurrent ANN  
c) Gated Recurrent ANN                d) None of the above

**6)** The two most commonly used technologies for imaging sensors are \_\_\_\_\_.

- a) RGB and HSV                      b) CDD and CMOS  
c) RGB and CIE                     d) CCD and CMOS

7) Imaging sensors in \_\_\_\_\_ cameras have both length and breadth.

- a) Volume scan                      b) Area Scan  
c) Line Scan                        d) Perimeter

**8)** The main function of the robot is \_\_\_\_\_.

- a) Sensing the environment by external sensor  
b) Decision making  
c) Performing  
d) all



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**Fourth Year (B.Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Robotics and Artificial Intelligence**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Attempt any two questions from each Section.  
2) Figures to the right indicates full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain major components of an industrial robot.                                  | <b>07</b> |
|            | <b>b)</b> Give classification of industrial robots.   | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain inductive and capacitive type of proximity sensors used in robots.        | <b>07</b> |
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| <b>Q.4</b> | <b>a)</b> Explain various end effectors used in industrial robots.                          | <b>07</b> |
|            | <b>b)</b> Explain forward kinematics for 2 DOF Planar Manipulator with suitable diagram.    | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain depth first and breadth first search techniques used in AI with example.                              | <b>07</b> |
|            | <b>b)</b> Explain Hill Climbing Method used in AI with diagrams.  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain Components of Fuzzy Logic Systems Architecture.   | <b>07</b> |
|            | <b>b)</b> Explain Artificial Neural Network with example.   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Explain various applications of Machine Vision Systems. What are advantages of using a Machine Vision System? | <b>07</b> |
|            | <b>b)</b> Explain CCD and CMOS sensors used in Machine Vision Systems.  | <b>07</b> |

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Robotics and Artificial Intelligence**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Who is called the father of fuzzy logic?
 

a) Lotfi Zadeh	b) Plato
c) George Boole	d) Aristotle
- 2) The simplest form of neural networks where input data travels in one direction only, passing through artificial neural nodes and exiting through output nodes is called \_\_\_\_\_.
 

a) Feed Forward ANN	b) Recurrent ANN
c) Gated Recurrent ANN	d) None of the above
- 3) The two most commonly used technologies for imaging sensors are \_\_\_\_\_.
 

a) RGB and HSV	b) CDD and CMOS
c) RGB and CIE	d) CCD and CMOS
- 4) Imaging sensors in \_\_\_\_\_ cameras have both length and breadth.
 

a) Volume scan	b) Area Scan
c) Line Scan	d) Perimeter
- 5) The main function of the robot is \_\_\_\_\_.
 

a) Sensing the environment by external sensor
b) Decision making
c) Performing
d) all
- 6) A 3D object in 3D space has got \_\_\_\_\_ degree/s of freedom.
 

a) 1	b) 5
c) 6	d) 4
- 7) Which of the following is a robot specification?
 

a) Control wrist	b) payload
c) robot energy	d) None of this
- 8) DC motors that are used in closed loop position control are called \_\_\_\_\_ motors.
 

a) Synchronous	b) Steeper
c) Brushless	d) Servo motors

- 9) A smart sensor can do which of the following?
  - a) Compensate for random errors
  - b) Automatic calibration of accuracy
  - c) Adjust for non linearities
  - d) all of the above
- 10) The most widely used technique of control for industrial robots is \_\_\_\_\_ control.
  - a) PI
  - b) PD
  - c) PID
  - d) ID
- 11) The process of finding the position of the end effector when the joint variable are know is called \_\_\_\_\_.
  - a) Forward Kinematics
  - b) Inverse Kinematics
  - c) Forward Dynamics
  - d) Inverse Dynamics
- 12) Artificial Intelligence is a technique which enables machines to \_\_\_\_\_ human behaviour.
  - a) Mimic
  - b) Ignore
  - c) Forget
  - d) None of the above
- 13) The \_\_\_\_\_ search generates all nodes at a particular level before proceeding to the next level of the tree.
  - a) Breadth First
  - b) Depth First
  - c) Hill Climbing
  - d) Production Systems
- 14) \_\_\_\_\_ are viewed as 'rules of thumb' that domain experts could use to generate good solutions without exhaustive search (rule-based expert systems).
  - a) Heuristics
  - b) Nodes
  - c) Production Systems
  - d) Exhaustive Search

<b>Seat No.</b>	
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**Fourth Year (B.Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Robotics and Artificial Intelligence**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Attempt any two questions from each Section.  
2) Figures to the right indicates full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain major components of an industrial robot.                                  | <b>07</b> |
|            | <b>b)</b> Give classification of industrial robots.   | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain inductive and capacitive type of proximity sensors used in robots.        | <b>07</b> |
|            | <b>b)</b> Explain hydraulic actuators used in robots with their advantages and limitations. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain various end effectors used in industrial robots.                          | <b>07</b> |
|            | <b>b)</b> Explain forward kinematics for 2 DOF Planar Manipulator with suitable diagram.    | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain depth first and breadth first search techniques used in AI with example.                              | <b>07</b> |
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|            | <b>b)</b> Explain CCD and CMOS sensors used in Machine Vision Systems.  | <b>07</b> |



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- 9) Imaging sensors in \_\_\_\_\_ cameras have both length and breadth.
  - a) Volume scan
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- 10) The main function of the robot is \_\_\_\_\_.
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- 11) A 3D object in 3D space has got \_\_\_\_\_ degree/s of freedom.
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  - a) Control wrist
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  - a) Synchronous
  - b) Steeper
  - c) Brushless
  - d) Servo motors
- 14) A smart sensor can do which of the following?
  - a) Compensate for random errors
  - b) Automatic calibration of accuracy
  - c) Adjust for non linearities
  - d) all of the above

<b>Seat No.</b>	
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**Fourth Year (B.Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Robotics and Artificial Intelligence**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Attempt any two questions from each Section.  
2) Figures to the right indicates full marks.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Explain major components of an industrial robot.                                  | <b>07</b> |
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| <b>Q.3</b> | <b>a)</b> Explain inductive and capacitive type of proximity sensors used in robots.        | <b>07</b> |
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| <b>Q.4</b> | <b>a)</b> Explain various end effectors used in industrial robots.                          | <b>07</b> |
|            | <b>b)</b> Explain forward kinematics for 2 DOF Planar Manipulator with suitable diagram.    | <b>07</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Explain depth first and breadth first search techniques used in AI with example.                              | <b>07</b> |
|            | <b>b)</b> Explain Hill Climbing Method used in AI with diagrams.  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain Components of Fuzzy Logic Systems Architecture.   | <b>07</b> |
|            | <b>b)</b> Explain Artificial Neural Network with example.   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Explain various applications of Machine Vision Systems. What are advantages of using a Machine Vision System? | <b>07</b> |
|            | <b>b)</b> Explain CCD and CMOS sensors used in Machine Vision Systems.  | <b>07</b> |

**Seat  
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Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) KAIZEN is Japanese word in which "KAI" means and "ZEN" means \_\_\_\_\_.  
a) Plan, do                                      b) Muda, muri  
c) change, better                                d) None of above
- 2) "ABC" analysis is done by arranging items in decreasing order of \_\_\_\_\_.  
a) Total Inventory costs                      b) Item value  
c) Annual usage valued                        d) Item demand
- 3) "\_\_\_\_\_" is one of benefits of six sigma.  
a) Top-down approach                          b) Down-Top approach  
c) Left-right approach                          d) None of above
- 4) If two variables,  $x$  and  $y$ , have a very strong linear relationship, then \_\_\_\_\_.  
a) there is evidence that  $x$  causes a change in  $y$   
b) there is evidence that  $y$  causes a change in  $x$   
c) there might not be any causal relationship between  $x$  and  $y$   
d) None of these alternatives is correct
- 5) The correct sequence of operations in production planning and control is \_\_\_\_\_.  
a) Dispatching-Routing-Scheduling- Follow up  
b) Routing-Scheduling-Dispatching-Follow up  
c) Scheduling-Routing- Dispatching-Follow up  
d) Routing-Scheduling-Follow up-Dispatching
- 6) "MAD" in relation with forecasting error stands for \_\_\_\_\_.  
a) Main absolute data                            b) Mean analysis data  
c) Mean absolute deviation                     d) None of these
- 7) In regression analysis, the variable that is being predicted is the \_\_\_\_\_.  
a) response, or dependent, variable  
b) independent variable  
c) intervening variable  
d) is usually  $x$

- 8) If the actual demand for a period is 100 units but forecast demand was 90 units. The forecast error is \_\_\_\_\_.
  - a) -10
  - b) +10
  - c) -5
  - d) +5
- 9) Forecast used for New product planning, capital expenditure, facility location are \_\_\_\_\_.
  - a) Long range time horizon
  - b) short range time horizon
  - c) medium range time horizon
  - d) None of above
- 10) Which of the following is not primary function for plant maintenance?
  - a) maintenance of existing plant and equipment
  - b) alterations to existing equipment and buildings
  - c) selling of old machineries
  - d) equipment inspection and lubrication
- 11) Which of the following is a production planning technique?
  - a) Dispatching
  - b) Loading
  - c) Inspection
  - d) expediting
- 12) Productivity can be improved by \_\_\_\_\_.
  - a) increasing inputs while holding outputs steady
  - b) decreasing outputs while holding inputs steady
  - c) increasing inputs and outputs in the same proportion
  - d) decreasing inputs while holding outputs steady
- 13) The full form of " ERP " stands for \_\_\_\_\_.
  - a) Enterprise Revenue Planning
  - b) Enterprise Recovery Planning
  - c) Enterprise Resource Planning
  - d) Enterprise Report Planning
- 14) Which of the following means 'visual cards'?
  - a) Poka-Yoke
  - b) Kanban
  - c) Both of above
  - d) None of above

Seat No.	
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Set **P**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Production and Operations Management**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Solve any two questions from Section I and Section II.

**Section – I**

- Q.2** a) Explain objectives and scope of Production Management in detail. **07**  
 b) Explain with example different types of manufacturing systems. **07**
- Q.3** a) Explain Exponential smoothening method of Forecasting with example. **07**  
 b) A dealer for LCD television forecasts the demand for televisions at the rate of 500 per month for next three months. The actual demand turned out to be 400, 560 and 700. Calculate forecast error and bias and also comment on same. **07**
- Q.4** **Write short Note on following.**  
 a) Functions of Production Planning and control **04**  
 b) Line Balancing **05**  
 c) Aggregate Planning **05**

**Section – II**

- Q.5** a) What are different types of Inventory? Explain various costs associated with Inventory. **07**  
 b) Write short note on Inventory control techniques? Explain "ABC analysis" technique in detail. **07**
- Q.6** a) Write difference between Preventive Vs Breakdown maintenance. **07**  
 b) Define value engineering and value analysis. Explain value analysis procedure. **07**
- Q.7** **Write short Note on following.**  
 a) Just in time (JIT) **05**  
 b) Six Sigma **05**  
 c) Supply chain management (SCM) **04**

<b>Seat No.</b>	
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Set **Q**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Production and Operations Management**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Solve any two questions from Section I and Section II.

**Section – I**

- Q.2** a) Explain objectives and scope of Production Management in detail. **07**  
 b) Explain with example different types of manufacturing systems. **07**
- Q.3** a) Explain Exponential smoothening method of Forecasting with example. **07**  
 b) A dealer for LCD television forecasts the demand for televisions at the rate of 500 per month for next three months. The actual demand turned out to be 400, 560 and 700. Calculate forecast error and bias and also comment on same. **07**
- Q.4** **Write short Note on following.**  
 a) Functions of Production Planning and control **04**  
 b) Line Balancing **05**  
 c) Aggregate Planning **05**

**Section – II**

- Q.5** a) What are different types of Inventory? Explain various costs associated with Inventory. **07**  
 b) Write short note on Inventory control techniques? Explain "ABC analysis" technique in detail. **07**
- Q.6** a) Write difference between Preventive Vs Breakdown maintenance. **07**  
 b) Define value engineering and value analysis. Explain value analysis procedure. **07**
- Q.7** **Write short Note on following.**  
 a) Just in time (JIT) **05**  
 b) Six Sigma **05**  
 c) Supply chain management (SCM) **04**

Set	R
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## Production and Operations Management

Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

Page 7 of 12

- 9) The correct sequence of operations in production planning and control is \_\_\_\_\_.  
a) Dispatching-Routing-Scheduling- Follow up  
b) Routing-Scheduling-Dispatching-Follow up  
c) Scheduling-Routing- Dispatching-Follow up  
d) Routing-Scheduling-Follow up-Dispatching
- 10) "MAD" in relation with forecasting error stands for \_\_\_\_\_.  
a) Main absolute data                      b) Mean analysis data  
c) Mean absolute deviation              d) None of these
- 11) In regression analysis, the variable that is being predicted is the \_\_\_\_\_.  
a) response, or dependent, variable  
b) independent variable  
c) intervening variable  
d) is usually x
- 12) If the actual demand for a period is 100 units but forecast demand was 90 units. The forecast error is \_\_\_\_\_.  
a) -10    b) +10  
c) -5    d) +5
- 13) Forecast used for New product planning, capital expenditure, facility location are \_\_\_\_\_.  
a) Long range time horizon              b) short range time horizon  
c) medium range time horizon          d) None of above
- 14) Which of the following is not primary function for plant maintenance?  
a) maintenance of existing plant and equipment  
b) alterations to existing equipment and buildings  
c) selling of old machineries  
d) equipment inspection and lubrication

Seat No.	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Production and Operations Management**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Solve any two questions from Section I and Section II.

**Section – I**

- Q.2** a) Explain objectives and scope of Production Management in detail. **07**  
 b) Explain with example different types of manufacturing systems. **07**
- Q.3** a) Explain Exponential smoothening method of Forecasting with example. **07**  
 b) A dealer for LCD television forecasts the demand for televisions at the rate of 500 per month for next three months. The actual demand turned out to be 400, 560 and 700. Calculate forecast error and bias and also comment on same. **07**
- Q.4** **Write short Note on following.**  
 a) Functions of Production Planning and control **04**  
 b) Line Balancing **05**  
 c) Aggregate Planning **05**

**Section – II**

- Q.5** a) What are different types of Inventory? Explain various costs associated with Inventory. **07**  
 b) Write short note on Inventory control techniques? Explain "ABC analysis" technique in detail. **07**
- Q.6** a) Write difference between Preventive Vs Breakdown maintenance. **07**  
 b) Define value engineering and value analysis. Explain value analysis procedure. **07**
- Q.7** **Write short Note on following.**  
 a) Just in time (JIT) **05**  
 b) Six Sigma **05**  
 c) Supply chain management (SCM) **04**

Seat No.	
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Set	S
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Production and Operations Management**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Make suitable assumptions if necessary and state them clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) "MAD" in relation with forecasting error stands for \_\_\_\_\_.  
 a) Main absolute data                      b) Mean analysis data  
 c) Mean absolute deviation              d) None of these
- 2) In regression analysis, the variable that is being predicted is the \_\_\_\_\_.  
 a) response, or dependent, variable  
 b) independent variable  
 c) intervening variable  
 d) is usually x
- 3) If the actual demand for a period is 100 units but forecast demand was 90 units. The forecast error is \_\_\_\_\_.  
 a) -10    b) +10  
 c) -5    d) +5
- 4) Forecast used for New product planning, capital expenditure, facility location are \_\_\_\_\_.  
 a) Long range time horizon              b) short range time horizon  
 c) medium range time horizon          d) None of above
- 5) Which of the following is not primary function for plant maintenance?  
 a) maintenance of existing plant and equipment  
 b) alterations to existing equipment and buildings  
 c) selling of old machineries  
 d) equipment inspection and lubrication
- 6) Which of the following is a production planning technique?  
 a) Dispatching                                  b) Loading  
 c) Inspection                                    d) expediting
- 7) Productivity can be improved by \_\_\_\_\_.  
 a) increasing inputs while holding outputs steady  
 b) decreasing outputs while holding inputs steady  
 c) increasing inputs and outputs in the same proportion  
 d) decreasing inputs while holding outputs steady

- 8) The full form of " ERP " stands for \_\_\_\_\_.  
a) Enterprise Revenue Planning    b) Enterprise Recovery Planning  
c) Enterprise Resource Planning    d) Enterprise Report Planning
- 9) Which of the following means 'visual cards'?  
a) Poka-Yoke    b) Kanban  
c) Both of above    d) None of above
- 10) KAIZEN is Japanese word in which " KAI"means and "ZEN" means \_\_\_\_\_.  
a) Plan, do    b) Muda, muri  
c) change, better    d) None of above
- 11) "ABC" analysis is done by arranging items in decreasing order of \_\_\_\_\_.  
a) Total Inventory costs    b) Item value  
c) Annual usage valued    d) Item demand
- 12) " \_\_\_\_\_ " is one of benefits of six sigma.  
a) Top-down approach    b) Down-Top approach  
c) Left-right approach    d) None of above
- 13) If two variables,  $x$  and  $y$ , have a very strong linear relationship, then \_\_\_\_\_.  
a) there is evidence that  $x$  causes a change in  $y$   
b) there is evidence that  $y$  causes a change in  $x$   
c) there might not be any causal relationship between  $x$  and  $y$   
d) None of these alternatives is correct
- 14) The correct sequence of operations in production planning and control is \_\_\_\_\_.  
a) Dispatching-Routing-Scheduling- Follow up  
b) Routing-Scheduling-Dispatching-Follow up  
c) Scheduling-Routing- Dispatching-Follow up  
d) Routing-Scheduling-Follow up-Dispatching

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Set **S**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Production and Operations Management**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Solve any two questions from Section I and Section II.

**Section – I**

- Q.2** a) Explain objectives and scope of Production Management in detail. **07**  
 b) Explain with example different types of manufacturing systems. **07**
- Q.3** a) Explain Exponential smoothening method of Forecasting with example. **07**  
 b) A dealer for LCD television forecasts the demand for televisions at the rate of 500 per month for next three months. The actual demand turned out to be 400, 560 and 700. Calculate forecast error and bias and also comment on same. **07**
- Q.4** **Write short Note on following.**  
 a) Functions of Production Planning and control **04**  
 b) Line Balancing **05**  
 c) Aggregate Planning **05**

**Section – II**

- Q.5** a) What are different types of Inventory? Explain various costs associated with Inventory. **07**  
 b) Write short note on Inventory control techniques? Explain "ABC analysis" technique in detail. **07**
- Q.6** a) Write difference between Preventive Vs Breakdown maintenance. **07**  
 b) Define value engineering and value analysis. Explain value analysis procedure. **07**
- Q.7** **Write short Note on following.**  
 a) Just in time (JIT) **05**  
 b) Six Sigma **05**  
 c) Supply chain management (SCM) **04**

<b>Seat No.</b>	
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- 9) A milk powder tin is being weighed as it is filled is an example of \_\_\_\_\_.  
a) Operation cum transportation  
b) Operation cum inspection  
c) Transportation cum inspection  
d) None of the above
- 10) \_\_\_\_\_ is the input for process planning.  
a) Design drawing  
b) Jigs and fixtures  
c) Tools  
d) Machine
- 11) \_\_\_\_\_ of following is most important skill which is not required by a process engineer.  
a) Knowledge of jigs and fixtures  
b) Knowledge of manufacturing process  
c) Design of product  
d) Interpret engg. drawings
- 12) In process picture sheet, locator is considered as \_\_\_\_\_.  
a) Square  
b) Circle  
c) Triangle  
d) Arrow
- 13) Type-II  
Match the pairs:  
a) SPM  
b) Job Production  
c) Standard M/C  
d) Mass production

**02**

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Set	P
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Process Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:**
- 1) Q. 2 and Q. 6 are compulsory.
  - 2) Answer any one full question from the remaining in each Section.
  - 3) Figures to right indicate full marks.
  - 4) Make suitable assumptions, if required and state them clearly.

**Section – I**

- Q.2** Prepare a process plan for manufacturing the component in figure 1 w.r.t. data supplied there in along following lines. **14**
- a) Route sheet
  - b) Operations list indicating sequence of operation indicating machine selected, holding methods, tool specifications and machining parameters per set up.
  - c) Gauges and or inspection methods and instruments.

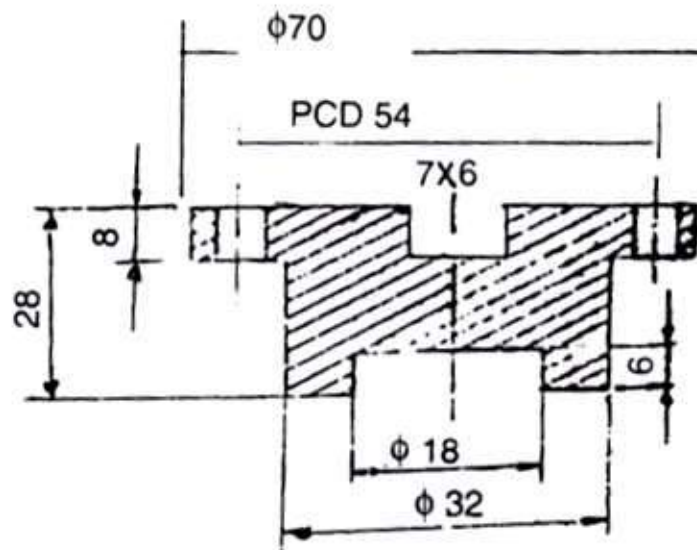


Figure 1

- Q.3**
- a) Write a note on Part Print Analysis with suitable example. **07**
  - b) What is feasibility study? Explain. **07**
- Q.4**
- a) What are the functions of process and product engineer in an organization? **07**
  - b) Explain types of production in detail. **07**
- Q.5**
- a) What is tolerance stack? Discuss methods to control the tolerance stack. **07**
  - b) Explain manufacturing system, input and output of process engineering. **07**

**Section – II**

- |            |  |                        |
|------------|--|------------------------|
| <b>Q.6</b> | Draw the process picture sheet for any four operations for manufacturing the component in Figure I w.r.t. sequence. Use standard symbols for locating whenever required. | <b>14</b>              |
| <b>Q.7</b> | <b>a)</b> What are the factors in tool selection and explain it with suitable example?<br><b>b)</b> Explain feasibility with its aspects.                                | <b>07</b><br><b>07</b> |
| <b>Q.8</b> | <b>a)</b> Write a note on selection criteria for GPM and SPM.<br><b>b)</b> What are the various sources of information to select machine and equipment?                  | <b>07</b><br><b>07</b> |
| <b>Q.9</b> | <b>a)</b> How do you classify the operations? Explain any three operations with neat sketch.<br><b>b)</b> Write a short note various sources of information.             | <b>07</b><br><b>07</b> |

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Set Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Process Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book).  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ of the following product is not continuous/process mfg. system.
 

a) Steel	b) Petrochemical
c) Cement	d) Ball pen
- 2) A milk powder tin is being weighed as it is filled is an example of \_\_\_\_\_.
 

a) Operation cum transportation
b) Operation cum inspection
c) Transportation cum inspection
d) None of the above
- 3) \_\_\_\_\_ is the input for process planning.
 

a) Design drawing	b) Jigs and fixtures
c) Tools	d) Machine
- 4) \_\_\_\_\_ of following is most important skill which is not required by a process engineer.
 


a) Knowledge of jigs and fixtures
b) Knowledge of manufacturing process
c) Design of product
d) Interpret engg. drawings
- 5) In process picture sheet, locator is considered as \_\_\_\_\_.
 

a) Square	b) Circle
c) Triangle	d) Arrow
- 6) Scrap and rework factor is considered as \_\_\_\_\_ in equipment selection.
 

a) Operational	b) Economic
c) Technical	d) Management
- 7) ISO 13399 is an international \_\_\_\_\_ information standard.
 

a) Cutting tool	b) General purpose machine
c) Special purpose machine	d) Gauge
- 8) Organisation establishes relationship between \_\_\_\_\_.
 

a) People, work & management	b) Customer, work & resource
c) People, work & resource	d) None of the above

- 9)  symbol used in drawing to interpret \_\_\_\_\_.  
a) Perpendicularity                      b) Position  
c) Symmetry                              d) Concentricity
- 10) The process assesses the practicality of the proposed plan for the project is called \_\_\_\_\_ study.  
a) Technical                              b) Managerial  
c) Feasibility                              d) Economical
- 11) Which of the following can be categorized as specific tooling \_\_\_\_\_?  
a) SPM                                      b) Gages  
c) Jigs and fixture                      d) Micro – base tool
- 12) Symbol used for inspection in method study is \_\_\_\_\_.  
a) Circle                                      b) Square  
c) Pyramid                                      d) Triangle
- 13) Type-II  
Match the pairs:  
a) SPM                                      b) Job Production  
c) Standard M/C                      d) Mass production

**02**

Seat No.	
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Set **Q**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Process Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 2 and Q. 6 are compulsory.  
 2) Answer any one full question from the remaining in each Section.  
 3) Figures to right indicate full marks.  
 4) Make suitable assumptions, if required and state them clearly.

**Section – I**

- Q.2** Prepare a process plan for manufacturing the component in figure 1 w.r.t. data supplied there in along following lines. **14**
- Route sheet
  - Operations list indicating sequence of operation indicating machine selected, holding methods, tool specifications and machining parameters per set up.
  - Gauges and or inspection methods and instruments.

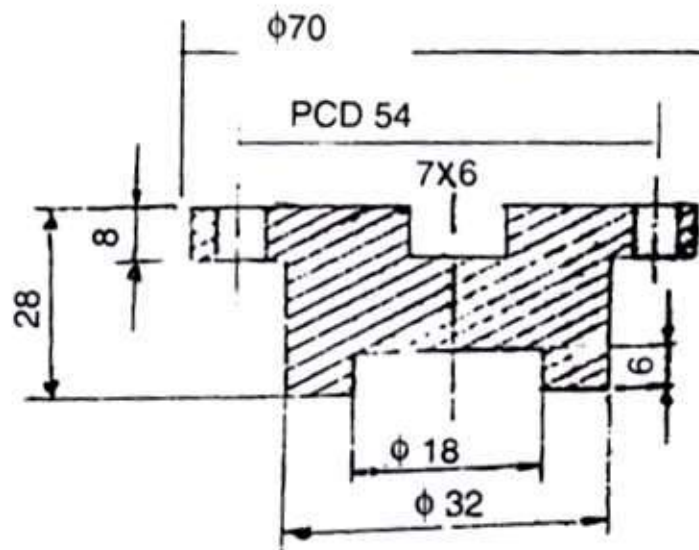


Figure 1

- Q.3** a) Write a note on Part Print Analysis with suitable example. **07**  
 b) What is feasibility study? Explain. **07**
- Q.4** a) What are the functions of process and product engineer in an organization? **07**  
 b) Explain types of production in detail. **07**
- Q.5** a) What is tolerance stack? Discuss methods to control the tolerance stack. **07**  
 b) Explain manufacturing system, input and output of process engineering. **07**

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.6</b> | Draw the process picture sheet for any four operations for manufacturing the component in Figure I w.r.t. sequence. Use standard symbols for locating whenever required. | <b>14</b> |
| <b>Q.7</b> | <b>a)</b> What are the factors in tool selection and explain it with suitable example?   | <b>07</b> |
|            | <b>b)</b> Explain feasibility with its aspects.  | <b>07</b> |
| <b>Q.8</b> | <b>a)</b> Write a note on selection criteria for GPM and SPM.  | <b>07</b> |
|            | <b>b)</b> What are the various sources of information to select machine and equipment?   | <b>07</b> |
| <b>Q.9</b> | <b>a)</b> How do you classify the operations? Explain any three operations with neat sketch.   | <b>07</b> |
|            | <b>b)</b> Write a short note various sources of information.   | <b>07</b> |

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Process Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book).  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.


**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ of following is most important skill which is not required by a process engineer.
  - a) Knowledge of jigs and fixtures
  - b) Knowledge of manufacturing process
  - c) Design of product
  - d) Interpret engg. drawings
- 2) In process picture sheet, locator is considered as \_\_\_\_\_.
  - a) Square
  - b) Circle
  - c) Triangle
  - d) Arrow
- 3) Scrap and rework factor is considered as \_\_\_\_\_ in equipment selection.
  - a) Operational
  - b) Economic
  - c) Technical
  - d) Management
- 4) ISO 13399 is an international \_\_\_\_\_ information standard.
  - a) Cutting tool
  - b) General purpose machine
  - c) Special purpose machine
  - d) Gauge
- 5) Organisation establishes relationship between \_\_\_\_\_.
  - a) People, work & management
  - b) Customer, work & resource
  - c) People, work & resource
  - d) None of the above
- 6)  symbol used in drawing to interpret \_\_\_\_\_.
  - a) Perpendicularity
  - b) Position
  - c) Symmetry
  - d) Concentricity
- 7) The process assesses the practicality of the proposed plan for the project is called \_\_\_\_\_ study.
  - a) Technical
  - b) Managerial
  - c) Feasibility
  - d) Economical
- 8) Which of the following can be categorized as specific tooling \_\_\_\_\_?
  - a) SPM
  - b) Gages
  - c) Jigs and fixture
  - d) Micro – base tool



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Process Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 2 and Q. 6 are compulsory.  
 2) Answer any one full question from the remaining in each Section.  
 3) Figures to right indicate full marks.  
 4) Make suitable assumptions, if required and state them clearly.

**Section – I**

- Q.2** Prepare a process plan for manufacturing the component in figure 1 w.r.t. data supplied there in along following lines. **14**
- Route sheet
  - Operations list indicating sequence of operation indicating machine selected, holding methods, tool specifications and machining parameters per set up.
  - Gauges and or inspection methods and instruments.

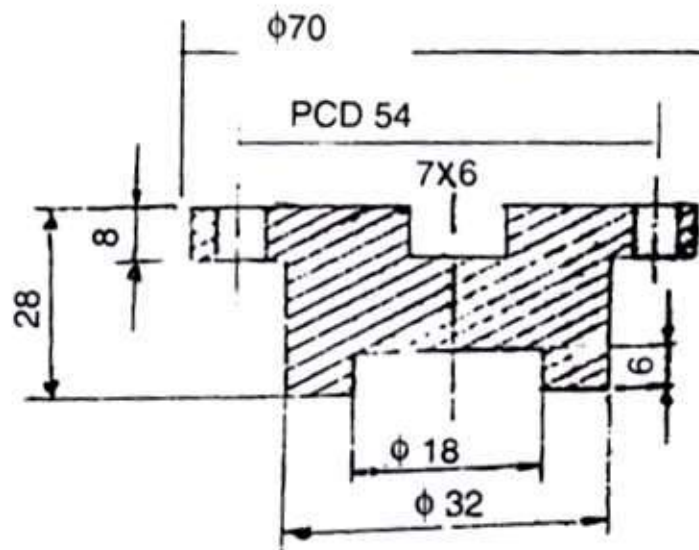


Figure 1

- Q.3**
  - Write a note on Part Print Analysis with suitable example. **07**
  - What is feasibility study? Explain. **07**
- Q.4**
  - What are the functions of process and product engineer in an organization? **07**
  - Explain types of production in detail. **07**
- Q.5**
  - What is tolerance stack? Discuss methods to control the tolerance stack. **07**
  - Explain manufacturing system, input and output of process engineering. **07**

**Section – II**

- |            |  |                        |
|------------|--|------------------------|
| <b>Q.6</b> | Draw the process picture sheet for any four operations for manufacturing the component in Figure I w.r.t. sequence. Use standard symbols for locating whenever required. | <b>14</b>              |
| <b>Q.7</b> | <b>a)</b> What are the factors in tool selection and explain it with suitable example?<br><b>b)</b> Explain feasibility with its aspects.                                | <b>07</b><br><b>07</b> |
| <b>Q.8</b> | <b>a)</b> Write a note on selection criteria for GPM and SPM.<br><b>b)</b> What are the various sources of information to select machine and equipment?                  | <b>07</b><br><b>07</b> |
| <b>Q.9</b> | <b>a)</b> How do you classify the operations? Explain any three operations with neat sketch.<br><b>b)</b> Write a short note various sources of information.             | <b>07</b><br><b>07</b> |


Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book).  
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3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 13 of 16

- 9) ISO 13399 is an international \_\_\_\_\_ information standard.  
a) Cutting tool                      b) General purpose machine  
c) Special purpose machine        d) Gauge
- 10) Organisation establishes relationship between \_\_\_\_\_.  
a) People, work & management      b) Customer, work & resource  
c) People, work & resource          d) None of the above
- 11)  symbol used in drawing to interpret \_\_\_\_\_.  
a) Perpendicularity                  b) Position  
c) Symmetry                          d) Concentricity
- 12) The process assesses the practicality of the proposed plan for the project is called \_\_\_\_\_ study.  
a) Technical                              b) Managerial  
c) Feasibility                            d) Economical
- 13) Type-II  
Match the pairs:  
a) SPM                                      b) Job Production  
c) Standard M/C                        d) Mass production

**02**

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Process Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 2 and Q. 6 are compulsory.  
 2) Answer any one full question from the remaining in each Section.  
 3) Figures to right indicate full marks.  
 4) Make suitable assumptions, if required and state them clearly.

**Section – I**

- Q.2** Prepare a process plan for manufacturing the component in figure 1 w.r.t. data supplied there in along following lines. **14**
- Route sheet
  - Operations list indicating sequence of operation indicating machine selected, holding methods, tool specifications and machining parameters per set up.
  - Gauges and or inspection methods and instruments.

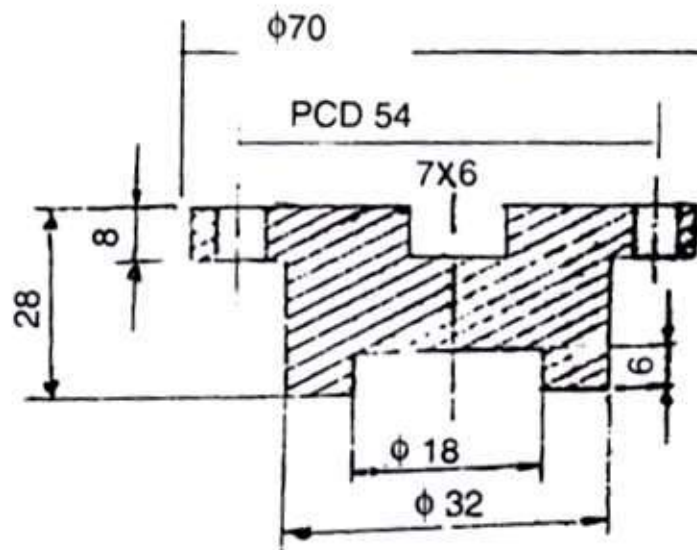


Figure 1

- Q.3** a) Write a note on Part Print Analysis with suitable example. **07**  
 b) What is feasibility study? Explain. **07**
- Q.4** a) What are the functions of process and product engineer in an organization? **07**  
 b) Explain types of production in detail. **07**
- Q.5** a) What is tolerance stack? Discuss methods to control the tolerance stack. **07**  
 b) Explain manufacturing system, input and output of process engineering. **07**

**Section – II**

- |            |  |                        |
|------------|--|------------------------|
| <b>Q.6</b> | Draw the process picture sheet for any four operations for manufacturing the component in Figure I w.r.t. sequence. Use standard symbols for locating whenever required. | <b>14</b>              |
| <b>Q.7</b> | <b>a)</b> What are the factors in tool selection and explain it with suitable example?<br><b>b)</b> Explain feasibility with its aspects.                                | <b>07</b><br><b>07</b> |
| <b>Q.8</b> | <b>a)</b> Write a note on selection criteria for GPM and SPM.<br><b>b)</b> What are the various sources of information to select machine and equipment?                  | <b>07</b><br><b>07</b> |
| <b>Q.9</b> | <b>a)</b> How do you classify the operations? Explain any three operations with neat sketch.<br><b>b)</b> Write a short note various sources of information.             | <b>07</b><br><b>07</b> |

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**Fourth Year (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MACHANICAL ENGINEERING**  
**Finite Element Method**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from Section I and Section II.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.  
 4) Use of non-programmable scientific calculator is allowed.

**Section – I**

- Q.2 a)** Obtain solution of differential equation by using Galerkin's method. **07**

$$3 \frac{\partial^2 u}{\partial x^2} + x + 2 = 0, \quad 0 \leq x \leq 1$$

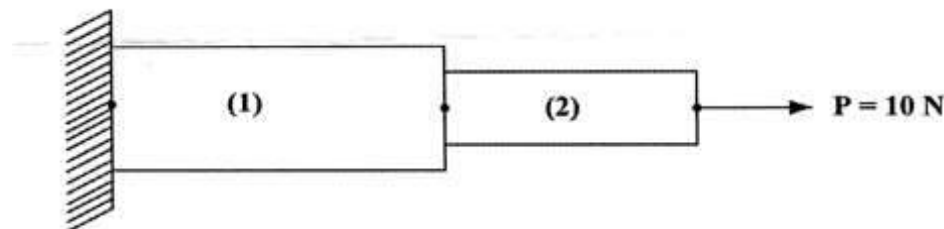
Take boundary conditions as  $u(0) = u(1) = 0$

- b)** Explain Simplex, Complex and Multiplex elements. **07**

- Q.3 a)** Find nodal displacement in stepped bar as shown in figure 1. **07**

Take  $A_1 = 20\text{mm}^2, A_2 = 10\text{mm}^2$

$L_1 = L_2 = 100\text{mm}, E = 200 \times 10^3 \text{MPa}$



**Figure 1:**

- b)** Explain steps in finite element method with examples. **07**

**Q.4 Attempt the following.**

- a)** Using Lagrange polynomials write down the shapes functions for a 1-D cubic truss element. **04**  
**b)** What are the properties of Stiffness matrix? Explain. **06**  
**c)** Write a note on principle of minimum potential energy. **04**

**Section – II**

- Q.5 a)** Solve the following problem for all unknowns. Impose the boundary conditions using the penalty method. Refer figure 2. **12**

$A_1 = 900\text{mm}^2, A_2 = 400\text{mm}^2, A_3 = 200\text{mm}^2$

$L_1 = 80\text{mm}, L_2 = 80\text{mm}, L_3 = 70\text{mm}$

$E_1 = 70 \text{GPa}, E_2 = 105 \text{GPa}, E_3 = 200 \text{GPa}$

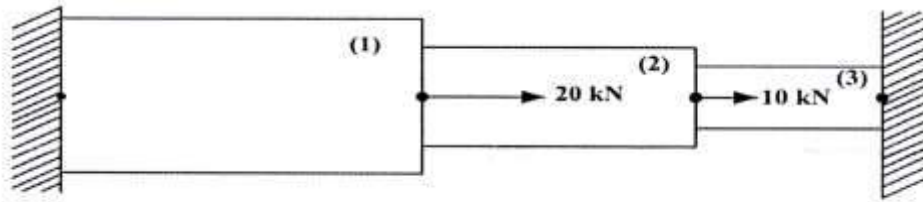


Figure 2:

b) What are superparametric elements? 02

Q.6 a) Calculate the value of field variable at the point A(2.0, 1.5), which is located inside the triangle as shown in figure 3. 07

The nodal values for field variable are  $U_i = 3.5$ ,  $U_j = 2.2$  and  $U_k = 4.4$

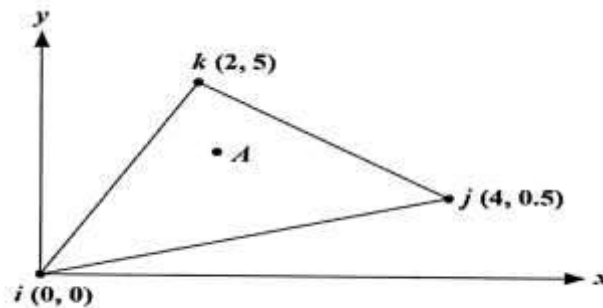


Figure 3:

b) What is convergence study? Why is it necessary to do a convergence study in FEA? 07

Q.7 Write short note on (Any Three) 14

- a) Geometric non-linearity
- b) Mesh refinement
- c) Harmonic analysis
- d) Transient analysis

Seat No.	
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Set Q
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**Fourth Year (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MACHANICAL ENGINEERING**  
**Finite Element Method**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 4) Assume the suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In finite element method the term finite stands for
  - a) Finite number of element
  - b) Finite number of nodes
  - c) Finite number of equations
  - d) Finite number of degrees of freedom
- 2) Interpolation function for a 2 noded simplex 1-D element is \_\_\_\_\_.
  - a)  $a_1 + a_2x$
  - b)  $a_1 + a_2x + a_3x^2$
  - c)  $a_1 + a_2x + a_3y$
  - d) None the above
- 3) Model analysis means finding
  - a) Mode shapes
  - b) Natural frequencies
  - c) Both (a) and (b)
  - d) None of the above
- 4) Improvement in the accuracy of finite element mesh by increasing the order of interpolation function used in the elements is
  - a) h-refinement
  - b) p-refinement
  - c) mesh refinement
  - d) p-h refinement
- 5) If the order of displacement interpolation function and geometry interpolation function is the same, then the element is called \_\_\_\_\_.
  - a) Subparametric
  - b) Superparametric
  - c) Isoparametric
  - d) Parametric
- 6) Post processing means
  - a) Meshing
  - b) Solving
  - c) Result analysis
  - d) Discretization
- 7) In \_\_\_\_\_ element the value of field variable remains unchanged in the circumferential direction.
  - a) 1D and 2D
  - b) Beam
  - c) Truss
  - d) Axisymmetric
- 8) Size of shape function matrix of 2D element having 3 nodes is \_\_\_\_\_.
  - a)  $2 \times 6$
  - b)  $3 \times 3$
  - c)  $4 \times 6$
  - d)  $2 \times 5$

- 9) The displacement at any point for 1D simplex element is obtained by \_\_\_\_\_.  
 a)  $u = N_i u_i + N_j u_j$       b)  $u = \frac{(x_j - x)}{L} u_i + \frac{(x - x_i)}{L} u_j$   
 c)  $u = a + bx$       d) All of these
- 10) Formula for Galerkin method is \_\_\_\_\_.  
 a)  $\int f(x) R(x) dx = 0$       b)  $\int R(x) dx = 0$   
 c)  $R(x) = 0$       d)  $\int R^2(x) dx = 0$
- 11) Summation of all shape functions within one element is equal to  
 a) 0      b) 1  
 c) 0.5      d) 1.5
- 12) The potential energy in a spring is given by the equation  
 a)  $\pi = \frac{1}{2} K U^2 - F U$       b)  $\pi = M g$   
 c)  $\pi = M c^2$       d)  $\pi = M k^2$
- 13) A measure of distortion of an element is  
 a) Bandwidth      b) Damping ratio  
 c) Aspect ratio      d) Shape function
- 14) A problem which is not a function of time  
 a) Eigenvalue problem      b) Steady state problem  
 c) Transient problem      d) Propagation problem

Seat No.	
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Set **Q**

**Fourth Year (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MACHANICAL ENGINEERING**  
**Finite Element Method**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from Section I and Section II.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.  
 4) Use of non-programmable scientific calculator is allowed.

**Section – I**

- Q.2 a)** Obtain solution of differential equation by using Galerkin's method. **07**

$$3 \frac{\partial^2 u}{\partial x^2} + x + 2 = 0, \quad 0 \leq x \leq 1$$

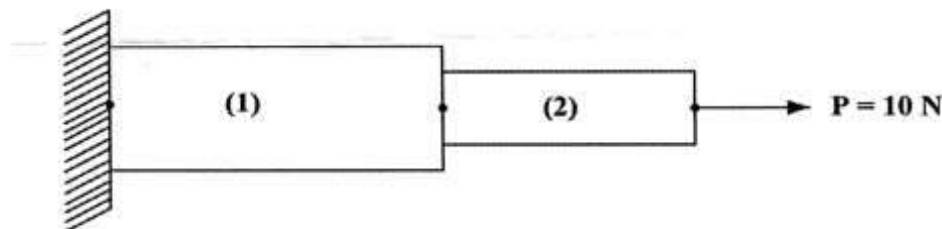
Take boundary conditions as  $u(0) = u(1) = 0$

- b)** Explain Simplex, Complex and Multiplex elements. **07**

- Q.3 a)** Find nodal displacement in stepped bar as shown in figure 1. **07**

Take  $A_1 = 20\text{mm}^2, A_2 = 10\text{mm}^2$

$L_1 = L_2 = 100\text{mm}, E = 200 \times 10^3 \text{MPa}$



**Figure 1:**

- b)** Explain steps in finite element method with examples. **07**

**Q.4 Attempt the following.**

- a)** Using Lagrange polynomials write down the shapes functions for a 1-D cubic truss element. **04**  
**b)** What are the properties of Stiffness matrix? Explain. **06**  
**c)** Write a note on principle of minimum potential energy. **04**

**Section – II**

- Q.5 a)** Solve the following problem for all unknowns. Impose the boundary conditions using the penalty method. Refer figure 2. **12**

$A_1 = 900\text{mm}^2, A_2 = 400\text{mm}^2, A_3 = 200\text{mm}^2$

$L_1 = 80\text{mm}, L_2 = 80\text{mm}, L_3 = 70\text{mm}$

$E_1 = 70 \text{ GPa}, E_2 = 105 \text{ GPa}, E_3 = 200 \text{ GPa}$

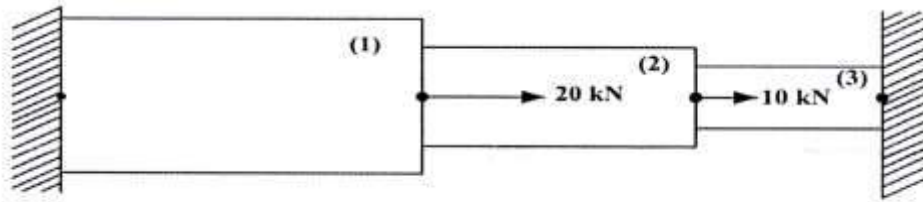


Figure 2:

b) What are superparametric elements? 02

Q.6 a) Calculate the value of field variable at the point A(2.0, 1.5), which is located inside the triangle as shown in figure 3. 07

The nodal values for field variable are  $U_i = 3.5$ ,  $U_j = 2.2$  and  $U_k = 4.4$

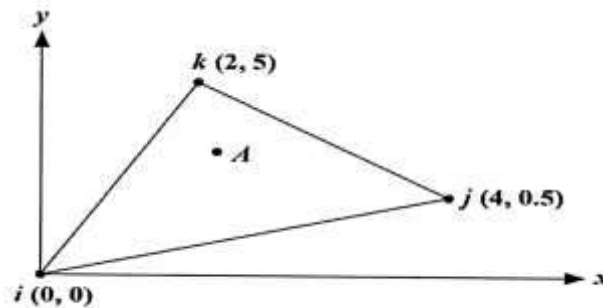


Figure 3:

b) What is convergence study? Why is it necessary to do a convergence study in FEA? 07

Q.7 Write short note on (Any Three) 14

- a) Geometric non-linearity
- b) Mesh refinement
- c) Harmonic analysis
- d) Transient analysis

Seat No.	
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Set **R**

**Fourth Year (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MACHANICAL ENGINEERING**  
**Finite Element Method**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 4) Assume the suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Improvement in the accuracy of finite element mesh by increasing the order of interpolation function used in the elements is
  - a) h-refinement
  - b) p-refinement
  - c) mesh refinement
  - d) p-h refinement
- 2) If the order of displacement interpolation function and geometry interpolation function is the same, then the element is called \_\_\_\_\_.
  - a) Subparametric
  - b) Superparametric
  - c) Isoparametric
  - d) Parametric
- 3) Post processing means
  - a) Meshing
  - b) Solving
  - c) Result analysis
  - d) Discretization
- 4) In \_\_\_\_\_ element the value of field variable remains unchanged in the circumferential direction.
  - a) 1D and 2D
  - b) Beam
  - c) Truss
  - d) Axisymmetric
- 5) Size of shape function matrix of 2D element having 3 nodes is \_\_\_\_\_.
  - a)  $2 \times 6$
  - b)  $3 \times 3$
  - c)  $4 \times 6$
  - d)  $2 \times 5$
- 6) The displacement at any point for 1D simplex element is obtained by \_\_\_\_\_.
  - a)  $u = N_i u_i + N_j u_j$
  - b)  $u = \frac{(x_j - x)}{L} u_i + \frac{(x - x_i)}{L} u_j$
  - c)  $u = a + bx$
  - d) All of these
- 7) Formula for Galerkin method is \_\_\_\_\_.
  - a)  $\int f(x) R(x) dx = 0$
  - b)  $\int R(x) dx = 0$
  - c)  $R(x) = 0$
  - d)  $\int R^2(x) dx = 0$
- 8) Summation of all shape functions within one element is equal to
  - a) 0
  - b) 1
  - c) 0.5
  - d) 1.5



- 9) The potential energy in a spring is given by the equation
- a)  $\pi = \frac{1}{2}KU^2 - FU$                       b)  $\pi = Mg$   
c)  $\pi = Mc^2$                                       c)  $\pi = Mk^2$
- 10) A measure of distortion of a element is
- a) Bandwidth                                      b) Damping ratio  
c) Aspect ratio                                      d) Shape function
- 11) A problem which is not a function of a time
- a) Eigenvalue problem                      b) Steady state problem  
c) Transient problem                      d) Propagation problem
- 12) In finite element method the term finite stands for
- a) Finite number of element  
b) Finite number of nodes  
c) Finite number of equations  
d) Finite number of degrees of freedom
- 13) Interpolation function for a 2 noded simplex 1-D element is \_\_\_\_.
- a)  $a_1 + a_2x$                                       b)  $a_1 + a_2x + a_3x^2$   
c)  $a_1 + a_2x + a_3y$                               d) None the above
- 14) Model analysis means finding
- a) Mode shapes                                      b) Natural frequencies  
c) Both (a) and (b)                              d) None of the above

Seat No.	
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Set **R**

**Fourth Year (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MACHANICAL ENGINEERING**  
**Finite Element Method**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from Section I and Section II.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.  
 4) Use of non-programmable scientific calculator is allowed.

**Section – I**

- Q.2 a)** Obtain solution of differential equation by using Galerkin's method. **07**

$$3 \frac{\partial^2 u}{\partial x^2} + x + 2 = 0, \quad 0 \leq x \leq 1$$

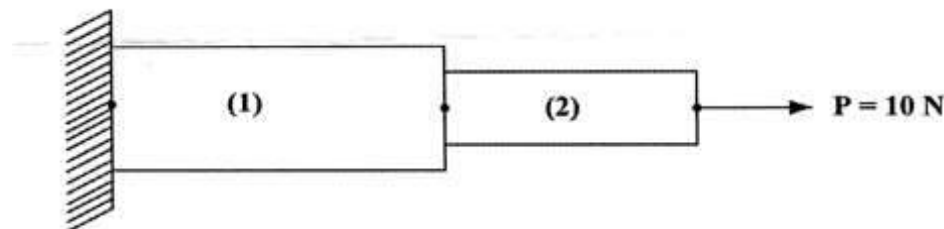
Take boundary conditions as  $u(0) = u(1) = 0$

- b)** Explain Simplex, Complex and Multiplex elements. **07**

- Q.3 a)** Find nodal displacement in stepped bar as shown in figure 1. **07**

Take  $A_1 = 20\text{mm}^2, A_2 = 10\text{mm}^2$

$L_1 = L_2 = 100\text{mm}, E = 200 \times 10^3 \text{MPa}$



**Figure 1:**

- b)** Explain steps in finite element method with examples. **07**

**Q.4 Attempt the following.**

- a)** Using Lagrange polynomials write down the shapes functions for a 1-D cubic truss element. **04**  
**b)** What are the properties of Stiffness matrix? Explain. **06**  
**c)** Write a note on principle of minimum potential energy. **04**

**Section – II**

- Q.5 a)** Solve the following problem for all unknowns. Impose the boundary conditions using the penalty method. Refer figure 2. **12**

$A_1 = 900\text{mm}^2, A_2 = 400\text{mm}^2, A_3 = 200\text{mm}^2$

$L_1 = 80\text{mm}, L_2 = 80\text{mm}, L_3 = 70\text{mm}$

$E_1 = 70 \text{GPa}, E_2 = 105 \text{GPa}, E_3 = 200 \text{GPa}$

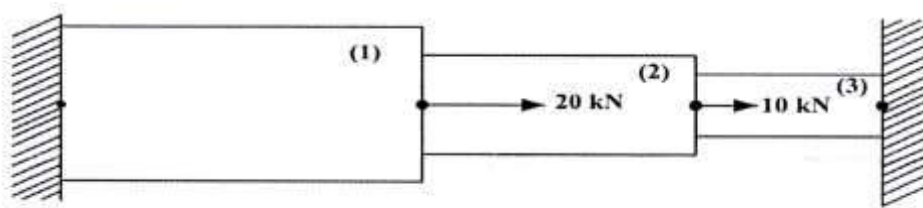


Figure 2:

b) What are superparametric elements? 02

Q.6 a) Calculate the value of field variable at the point A(2.0, 1.5), which is located inside the triangle as shown in figure 3. 07

The nodal values for field variable are  $U_i = 3.5$ ,  $U_j = 2.2$  and  $U_k = 4.4$

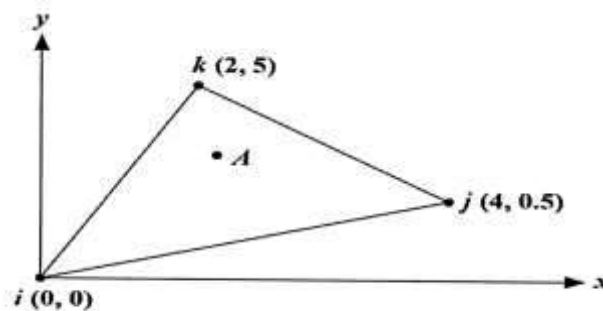


Figure 3:

b) What is convergence study? Why is it necessary to do a convergence study in FEA? 07

Q.7 Write short note on (Any Three) 14

- a) Geometric non-linearity
- b) Mesh refinement
- c) Harmonic analysis
- d) Transient analysis

Seat No.	
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Set	S
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**Fourth Year (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MACHANICAL ENGINEERING**  
**Finite Element Method**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 4) Assume the suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A measure of distortion of a element is
  - a) Bandwidth
  - b) Damping ratio
  - c) Aspect ratio
  - d) Shape function
- 2) A problem which is not a function of a time
  - a) Eigenvalue problem
  - b) Steady state problem
  - c) Transient problem
  - d) Propagation problem
- 3) In finite element method the term finite stands for
  - a) Finite number of element
  - b) Finite number of nodes
  - c) Finite number of equations
  - d) Finite number of degrees of freedom
- 4) Interpolation function for a 2 noded simplex 1-D element is \_\_\_\_\_.
  - a)  $a_1 + a_2x$
  - b)  $a_1 + a_2x + a_3x^2$
  - c)  $a_1 + a_2x + a_3y$
  - d) None the above
- 5) Model analysis means finding
  - a) Mode shapes
  - b) Natural frequencies
  - c) Both (a) and (b)
  - d) None of the above
- 6) Improvement in the accuracy of finite element mesh by increasing the order of interpolation function used in the elements is
  - a) h-refinement
  - b) p-refinement
  - c) mesh refinement
  - d) p-h refinement
- 7) If the order of displacement interpolation function and geometry interpolation function is the same, then the element is called \_\_\_\_\_.
  - a) Subparametric
  - b) Superparametric
  - c) Isoparametric
  - d) Parametric
- 8) Post processing means
  - a) Meshing
  - b) Solving
  - c) Result analysis
  - d) Discretization

- Page 14 of 16

Seat No.	
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Set **S**

**Fourth Year (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**MACHANICAL ENGINEERING**  
**Finite Element Method**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two questions from Section I and Section II.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary and mention it clearly.  
 4) Use of non-programmable scientific calculator is allowed.

**Section – I**

- Q.2 a)** Obtain solution of differential equation by using Galerkin's method. **07**

$$3 \frac{\partial^2 u}{\partial x^2} + x + 2 = 0, \quad 0 \leq x \leq 1$$

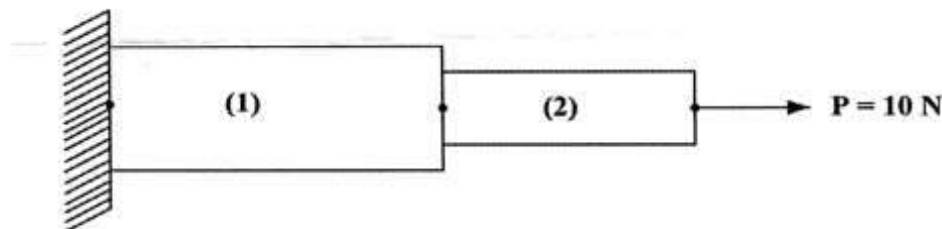
Take boundary conditions as  $u(0) = u(1) = 0$

- b)** Explain Simplex, Complex and Multiplex elements. **07**

- Q.3 a)** Find nodal displacement in stepped bar as shown in figure 1. **07**

Take  $A_1 = 20\text{mm}^2, A_2 = 10\text{mm}^2$

$L_1 = L_2 = 100\text{mm}, E = 200 \times 10^3 \text{MPa}$



**Figure 1:**

- b)** Explain steps in finite element method with examples. **07**

**Q.4 Attempt the following.**

- a)** Using Lagrange polynomials write down the shapes functions for a 1-D cubic truss element. **04**  
**b)** What are the properties of Stiffness matrix? Explain. **06**  
**c)** Write a note on principle of minimum potential energy. **04**

**Section – II**

- Q.5 a)** Solve the following problem for all unknowns. Impose the boundary conditions using the penalty method. Refer figure 2. **12**

$A_1 = 900\text{mm}^2, A_2 = 400\text{mm}^2, A_3 = 200\text{mm}^2$

$L_1 = 80\text{mm}, L_2 = 80\text{mm}, L_3 = 70\text{mm}$

$E_1 = 70 \text{ GPa}, E_2 = 105 \text{ GPa}, E_3 = 200 \text{ GPa}$

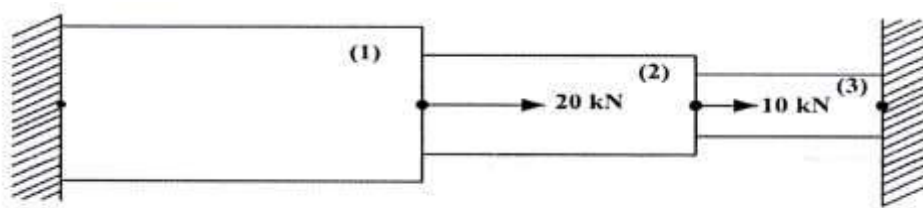


Figure 2:

b) What are superparametric elements? 02

Q.6 a) Calculate the value of field variable at the point A(2.0, 1.5), which is located inside the triangle as shown in figure 3. 07

The nodal values for field variable are  $U_i = 3.5$ ,  $U_j = 2.2$  and  $U_k = 4.4$

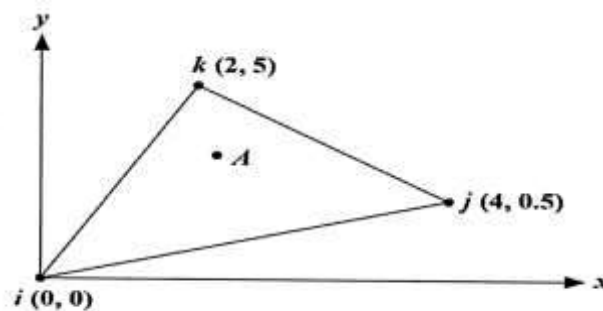


Figure 3:

b) What is convergence study? Why is it necessary to do a convergence study in FEA? 07

Q.7 Write short note on (Any Three) 14

- a) Geometric non-linearity
- b) Mesh refinement
- c) Harmonic analysis
- d) Transient analysis

**Seat  
No.**

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Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the given options.**

14

- 1) weight of the engine is categorized in \_\_\_\_\_.  
a) Sprung Mass                                      b) Unsprung Mass  
c) Non-Sprung Mass                                d) Dummy Mass
- 2) weight of the wheels is categorized in \_\_\_\_\_.  
a) Sprung Mass                                      b) Unsprung Mass  
c) Non-Sprung Mass                                d) Dummy Mass
- 3) weight of the break is categorized in \_\_\_\_\_.  
a) Sprung Mass                                      b) Unsprung Mass  
c) Non-Sprung Mass                                d) Dummy Mass
- 4) \_\_\_\_\_ dampers are used to allow full fresh air into the car under normal operating conditions.  
a) Fresh Air    b) Existing Air  
c) Exist Air    d) None of Above
- 5) \_\_\_\_\_ is not a coupling used in Railway Coaches.  
a) Screw Coupling                                 b) Side Buffer Coupling  
c) Central Buffer Coupling                        d) Tie Coupling
- 6) In \_\_\_\_\_ coupling accident & life damage chances are more.  
a) Screw Coupling                                 b) Side Buffer Coupling  
c) Central Buffer Coupling                        d) None of these
- 7) \_\_\_\_\_ is not a method of defrosting in A.C.  
a) Manual    b) Pressure Control  
c) Temperature Control                          d) Allied Method
- 8) Which is the following components of a semaphore signals?  
a) Movable Arm                                    b) Crank Rod  
c) Spectacle Frame                                d) All of These
- 9) The following is not a classification of maintenance  
a) Corrective maintenance                      b) Timely maintenance  
c) Scheduled maintenance                      d) Preventive maintenance



- 10)** Belt of an electric motor is broken, it needs \_\_\_\_\_.  
a) Corrective Maintenance      b) Scheduled Maintenance  
c) Preventive Maintenance      d) Timely Maintenance
- 11)** \_\_\_\_\_ is not a part of fire triangle  
a) Fuel      b) Heat  
c) Oxygen      d) Water
- 12)** \_\_\_\_\_ is not a stage for fire.  
a) Propagation.      b) Period of Decline  
c) Flash Over      d) Fully Developed
- 13)** Railway Meets around \_\_\_\_\_ % of freight Transportation.  
a) 45      b) 70  
c) 90      d) 60
- 14)** Maintenance consist of the following action(s)  
a) Replace of component      b) Repair of component  
c) Service of component      d) All of the above

<b>Seat No.</b>	
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**Set****P**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Systems Management**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Solve any two questions from each section.  
 2) Figures to right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is function of Break? Explain Vacuum Breaks used in Railways.   | <b>07</b> |
|            | <b>b)</b> What is necessity of Air Suspension in Railways? Explain various loading steps in Air Spring.                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain different types of Couplings used in railways for joining two coaches. Explain advantages of CBC Couplers. | <b>08</b> |
|            | <b>b)</b> Write short note on ventilation cut-off switch & freezing protections.   | <b>06</b> |
| <b>Q.4</b> | <b>a)</b> Write checkpoints for shell maintenance.   | <b>08</b> |
|            | <b>b)</b> What is future of signalling w.r.t. Railways?  | <b>06</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Write short note on CBTC (communication based train Control).           | <b>08</b> |
|            | <b>b)</b> Explain - Rolling stock management in Trains                            | <b>06</b> |
| <b>Q.6</b> | <b>a)</b> Explain - Rolling stock interior & ergonomics                           | <b>07</b> |
|            | <b>b)</b> Write short note on - safety devices & fire extinguisher                | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Write process of maintenance for Traction Motor & Gear Box in Railways. | <b>08</b> |
|            | <b>b)</b> Write short note on Scrap Management in Railways.                       | <b>06</b> |

<b>Seat No.</b>	
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- 10) weight of the break is categorized in \_\_\_\_\_.
  - a) Sprung Mass
  - b) Unsprung Mass
  - c) Non-Sprung Mass
  - d) Dummy Mass
- 11) \_\_\_\_\_ dampers are used to allow full fresh air into the car under normal operating conditions.
  - a) Fresh Air
  - b) Existing Air
  - c) Exist Air
  - d) None of Above
- 12) \_\_\_\_\_ is not a coupling used in Railway Coaches.
  - a) Screw Coupling
  - b) Side Buffer Coupling
  - c) Central Buffer Coupling
  - d) Tie Coupling
- 13) In \_\_\_\_\_ coupling accident & life damage chances are more.
  - a) Screw Coupling
  - b) Side Buffer Coupling
  - c) Central Buffer Coupling
  - d) None of these
- 14) \_\_\_\_\_ is not a method of defrosting in A.C.
  - a) Manual
  - b) Pressure Control
  - c) Temperature Control
  - d) Allied Method

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Systems Management**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each section.  
 2) Figures to right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is function of Break? Explain Vacuum Breaks used in Railways.   | <b>07</b> |
|            | <b>b)</b> What is necessity of Air Suspension in Railways? Explain various loading steps in Air Spring.                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain different types of Couplings used in railways for joining two coaches. Explain advantages of CBC Couplers. | <b>08</b> |
|            | <b>b)</b> Write short note on ventilation cut-off switch & freezing protections.   | <b>06</b> |
| <b>Q.4</b> | <b>a)</b> Write checkpoints for shell maintenance.   | <b>08</b> |
|            | <b>b)</b> What is future of signalling w.r.t. Railways?  | <b>06</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Write short note on CBTC (communication based train Control).           | <b>08</b> |
|            | <b>b)</b> Explain - Rolling stock management in Trains                            | <b>06</b> |
| <b>Q.6</b> | <b>a)</b> Explain - Rolling stock interior & ergonomics                           | <b>07</b> |
|            | <b>b)</b> Write short note on - safety devices & fire extinguisher                | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Write process of maintenance for Traction Motor & Gear Box in Railways. | <b>08</b> |
|            | <b>b)</b> Write short note on Scrap Management in Railways.                       | <b>06</b> |

Seat No.	
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Set **R**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Systems Management**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ is not a part of fire triangle
  - a) Fuel
  - b) Heat
  - c) Oxygen
  - d) Water
- 2) \_\_\_\_\_ is not a stage for fire.
  - a) Propagation.
  - b) Period of Decline
  - c) Flash Over
  - d) Fully Developed
- 3) Railway Meets around \_\_\_\_\_ % of freight Transportation.
  - a) 45
  - b) 70
  - c) 90
  - d) 60
- 4) Maintenance consist of the following action(s)
  - a) Replace of component
  - b) Repair of component
  - c) Service of component
  - d) All of the above
- 5) weight of the engine is categorized in \_\_\_\_\_.
  - a) Sprung Mass
  - b) Unsprung Mass
  - c) Non-Sprung Mass
  - d) Dummy Mass
- 6) weight of the wheels is categorized in \_\_\_\_\_.
  - a) Sprung Mass
  - b) Unsprung Mass
  - c) Non-Sprung Mass
  - d) Dummy Mass
- 7) weight of the break is categorized in \_\_\_\_\_.
  - a) Sprung Mass
  - b) Unsprung Mass
  - c) Non-Sprung Mass
  - d) Dummy Mass
- 8) \_\_\_\_\_ dampers are used to allow full fresh air into the car under normal operating conditions.
  - a) Fresh Air
  - b) Existing Air
  - c) Exist Air
  - d) None of Above
- 9) \_\_\_\_\_ is not a coupling used in Railway Coaches.
  - a) Screw Coupling
  - b) Side Buffer Coupling
  - c) Central Buffer Coupling
  - d) Tie Coupling

- 10) In \_\_\_\_\_ coupling accident & life damage chances are more.

a) Screw Coupling	b) Side Buffer Coupling
c) Central Buffer Coupling	d) None of these
- 11) \_\_\_\_\_ is not a method of defrosting in A.C.

a) Manual	b) Pressure Control
c) Temperature Control	d) Allied Method
- 12) Which is the following components of a semaphore signals?

a) Movable Arm	b) Crank Rod
c) Spectacle Frame	d) All of These
- 13) The following is not a classification of maintenance

a) Corrective maintenance	b) Timely maintenance
c) Scheduled maintenance	d) Preventive maintenance
- 14) Belt of an electric motor is broken, it needs \_\_\_\_\_.

a) Corrective Maintenance	b) Scheduled Maintenance
c) Preventive Maintenance	d) Timely Maintenance

<b>Seat No.</b>	
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**Set R**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Systems Management**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from each section.  
 2) Figures to right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is function of Break? Explain Vacuum Breaks used in Railways.   | <b>07</b> |
|            | <b>b)</b> What is necessity of Air Suspension in Railways? Explain various loading steps in Air Spring.                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain different types of Couplings used in railways for joining two coaches. Explain advantages of CBC Couplers. | <b>08</b> |
|            | <b>b)</b> Write short note on ventilation cut-off switch & freezing protections.   | <b>06</b> |
| <b>Q.4</b> | <b>a)</b> Write checkpoints for shell maintenance.   | <b>08</b> |
|            | <b>b)</b> What is future of signalling w.r.t. Railways?  | <b>06</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Write short note on CBTC (communication based train Control).           | <b>08</b> |
|            | <b>b)</b> Explain - Rolling stock management in Trains                            | <b>06</b> |
| <b>Q.6</b> | <b>a)</b> Explain - Rolling stock interior & ergonomics                           | <b>07</b> |
|            | <b>b)</b> Write short note on - safety devices & fire extinguisher                | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Write process of maintenance for Traction Motor & Gear Box in Railways. | <b>08</b> |
|            | <b>b)</b> Write short note on Scrap Management in Railways.                       | <b>06</b> |



Seat No.	
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Set **S**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Systems Management**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In \_\_\_\_\_ coupling accident & life damage chances are more.
  - a) Screw Coupling
  - b) Side Buffer Coupling
  - c) Central Buffer Coupling
  - d) None of these
- 2) \_\_\_\_\_ is not a method of defrosting in A.C.
  - a) Manual
  - b) Pressure Control
  - c) Temperature Control
  - d) Allied Method
- 3) Which is the following components of a semaphore signals?
  - a) Movable Arm
  - b) Crank Rod
  - c) Spectacle Frame
  - d) All of These
- 4) The following is not a classification of maintenance
  - a) Corrective maintenance
  - b) Timely maintenance
  - c) Scheduled maintenance
  - d) Preventive maintenance
- 5) Belt of an electric motor is broken, it needs \_\_\_\_\_.
  - a) Corrective Maintenance
  - b) Scheduled Maintenance
  - c) Preventive Maintenance
  - d) Timely Maintenance
- 6) \_\_\_\_\_ is not a part of fire triangle
  - a) Fuel
  - b) Heat
  - c) Oxygen
  - d) Water
- 7) \_\_\_\_\_ is not a stage for fire.
  - a) Propagation.
  - b) Period of Decline
  - c) Flash Over
  - d) Fully Developed
- 8) Railway Meets around \_\_\_\_\_ % of freight Transportation.
  - a) 45
  - b) 70
  - c) 90
  - d) 60
- 9) Maintenance consist of the following action(s)
  - a) Replace of component
  - b) Repair of component
  - c) Service of component
  - d) All of the above

- 10) weight of the engine is categorized in \_\_\_\_\_.
  - a) Sprung Mass
  - b) Unsprung Mass
  - c) Non-Sprung Mass
  - d) Dummy Mass
- 11) weight of the wheels is categorized in \_\_\_\_\_.
  - a) Sprung Mass
  - b) Unsprung Mass
  - c) Non-Sprung Mass
  - d) Dummy Mass
- 12) weight of the break is categorized in \_\_\_\_\_.
  - a) Sprung Mass
  - b) Unsprung Mass
  - c) Non-Sprung Mass
  - d) Dummy Mass
- 13) \_\_\_\_\_ dampers are used to allow full fresh air into the car under normal operating conditions.
  - a) Fresh Air
  - b) Existing Air
  - c) Exist Air
  - d) None of Above
- 14) \_\_\_\_\_ is not a coupling used in Railway Coaches.
  - a) Screw Coupling
  - b) Side Buffer Coupling
  - c) Central Buffer Coupling
  - d) Tie Coupling

<b>Seat No.</b>	
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**Set S**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Railway Systems Management**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Solve any two questions from each section.  
 2) Figures to right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> What is function of Break? Explain Vacuum Breaks used in Railways.   | <b>07</b> |
|            | <b>b)</b> What is necessity of Air Suspension in Railways? Explain various loading steps in Air Spring.                      | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain different types of Couplings used in railways for joining two coaches. Explain advantages of CBC Couplers. | <b>08</b> |
|            | <b>b)</b> Write short note on ventilation cut-off switch & freezing protections.   | <b>06</b> |
| <b>Q.4</b> | <b>a)</b> Write checkpoints for shell maintenance.   | <b>08</b> |
|            | <b>b)</b> What is future of signalling w.r.t. Railways?  | <b>06</b> |

**Section – II**

- |            |   |           |
|------------|---|-----------|
| <b>Q.5</b> | <b>a)</b> Write short note on CBTC (communication based train Control).           | <b>08</b> |
|            | <b>b)</b> Explain - Rolling stock management in Trains                            | <b>06</b> |
| <b>Q.6</b> | <b>a)</b> Explain - Rolling stock interior & ergonomics                           | <b>07</b> |
|            | <b>b)</b> Write short note on - safety devices & fire extinguisher                | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Write process of maintenance for Traction Motor & Gear Box in Railways. | <b>08</b> |
|            | <b>b)</b> Write short note on Scrap Management in Railways.                       | <b>06</b> |

Seat No.	
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Set **P**

**Fourth. Year (B.Tech.) (Sem– I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Entrepreneurship Development**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The term Entrepreneur is derived from the \_\_\_\_\_ word.
  - a) English
  - b) Tamil
  - c) Hindi
  - d) French
- 2) Refusal to adopt and use opportunities to make changes in production \_\_\_\_\_ entrepreneur.
  - a) Fabian
  - b) Imitative
  - c) Innovative
  - d) Drone
- 3) Environmental scanning focuses \_\_\_\_\_
  - a) Profit
  - b) Ideas
  - c) Production
  - d) Creativity
- 4) The person who creates an enterprise is called
  - a) Entrepreneur
  - b) Managers
  - c) Leaders
  - d) Owners
- 5) A corporate manager who starts a new initiative for their company which entails setting up a new distinct business unit and board of directors can be regarded as?
  - a) Ecopreneur
  - b) Technopreneur
  - c) Intrapreneur
  - d) Social Entrepreneur
- 6) Which of the following is not a characteristic of an entrepreneur?
  - a) Need for independence
  - b) Need for affiliation
  - c) Need for achievement
  - d) Risk taking
- 7) A business arrangement where one party allows another party to use a business name and sell its products or services is known as \_\_\_\_\_.
  - a) A cooperative.
  - b) A franchise.
  - c) An owner-manager business
  - d) A limited company.
- 8) State Industrial corporations engage in the development of \_\_\_\_\_.
  - a) industrial estates
  - b) institutional estates
  - c) individual investors
  - d) agricultural entrepreneurs

- Page 2 of 12

Seat No.	
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Set

P

**Fourth. Year (B.Tech.) (Sem– I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Entrepreneurship Development**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Attempt any two questions from each section.  
 2) Neat sketches must be drawn whenever necessary.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Describe the importance and significance of growth of entrepreneurial activity.           | <b>07</b> |
|            | <b>b)</b> Explain various characteristics and qualities of entrepreneurs.                           | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain various factors influencing entrepreneurial development and motivation.           | <b>07</b> |
|            | <b>b)</b> What is EDP? Explain phases and problems faced by EDPs.                                   | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Describe various problems face by potential Entrepreneur and their probable solutions.    | <b>07</b> |
|            | <b>b)</b> What is franchising? Explain its advantages and limitations to franchisor and franchisee. | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What is Idea generation? Describe various sources and methods of idea generation.  | <b>07</b> |
|            | <b>b)</b> What is business plan? Explain Financial and marketing Plan.                       | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is project report? Describe its elements and significance.                    | <b>07</b> |
|            | <b>b)</b> Explain sole proprietorship and partnership with their advantages and limitations. | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Describe various Steps in setting up a small unit.                                 | <b>07</b> |
|            | <b>b)</b> Explain SIDBI, NABARD, DIC and their role in Development of SMEs.                  | <b>07</b> |

Seat No.	
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Set 

Q
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**Fourth. Year (B.Tech.) (Sem– I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Entrepreneurship Development**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) State Industrial corporations engage in the development of \_\_\_\_\_.  
 a) industrial estates                      b) institutional estates  
 c) individual investors                      d) agricultural entrepreneurs
- 2) Business plan is an important \_\_\_\_\_ for entrepreneurs.  
 a) document                      b) tool  
 c) vision                      d) mission
- 3) \_\_\_\_\_ Report is a document where in all the details obtained from technical analysis, financial analysis, profitability analysis etc. are put together.  
 a) Feasibility                      b) Project  
 c) Both                      d) None
- 4) To provide financial assistance to entrepreneurs the government has set up a number of \_\_\_\_\_.  
 a) financial advisors                      b) financial intermediaries  
 c) Industrial estates                      d) financial institutions
- 5) SIDBI was set up as a subsidiary of \_\_\_\_\_.  
 a) IDBI                      b) IFCI  
 c) ICICI                      d) SFC
- 6) District Industries Centres are located \_\_\_\_\_.  
 a) in each district                      b) in each state  
 c) only in selected districts                      d) only in selected states
- 7) SIDBI stands for \_\_\_\_\_.  
 a) Small Institutions Development Bank of India  
 b) Small Industries Development Bank of India  
 c) Small Industries Derivatives Bank of India  
 d) Small Industries Development Bureau of India
- 8) The term Entrepreneur is derived from the \_\_\_\_\_ word.  
 a) English                      b) Tamil  
 c) Hindi                      d) French

- 9) Refusal to adopt and use opportunities to make changes in production \_\_\_\_ entrepreneur.
- |               |              |
|---------------|--------------|
| a) Fabian     | b) Imitative |
| c) Innovative | d) Drone     |
- 10) Environmental scanning focuses \_\_\_\_\_
- |               |               |
|---------------|---------------|
| a) Profit     | b) Ideas      |
| c) Production | d) Creativity |
- 11) The person who creates an enterprise is called
- |                 |             |
|-----------------|-------------|
| a) Entrepreneur | b) Managers |
| c) Leaders      | d) Owners   |
- 12) A corporate manager who starts a new initiative for their company which entails setting up a new distinct business unit and board of directors can be regarded as?
- |                 |                        |
|-----------------|------------------------|
| a) Ecopreneur   | b) Technopreneur       |
| c) Intrapreneur | d) Social Entrepreneur |
- 13) Which of the following is not a characteristic of an entrepreneur?
- |                          |                         |
|--------------------------|-------------------------|
| a) Need for independence | b) Need for affiliation |
| c) Need for achievement  | d) Risk taking          |
- 14) A business arrangement where one party allows another party to use a business name and sell its products or services is known as \_\_\_\_.
- |                              |                       |
|------------------------------|-----------------------|
| a) A cooperative.            | b) A franchise.       |
| c) An owner-manager business | d) A limited company. |



Seat No.	
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Set	Q
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**Fourth. Year (B.Tech.) (Sem– I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Entrepreneurship Development**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Attempt any two questions from each section.  
 2) Neat sketches must be drawn whenever necessary.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Describe the importance and significance of growth of entrepreneurial activity.           | <b>07</b> |
|            | <b>b)</b> Explain various characteristics and qualities of entrepreneurs.                           | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain various factors influencing entrepreneurial development and motivation.           | <b>07</b> |
|            | <b>b)</b> What is EDP? Explain phases and problems faced by EDPs.                                   | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Describe various problems face by potential Entrepreneur and their probable solutions.    | <b>07</b> |
|            | <b>b)</b> What is franchising? Explain its advantages and limitations to franchisor and franchisee. | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What is Idea generation? Describe various sources and methods of idea generation.  | <b>07</b> |
|            | <b>b)</b> What is business plan? Explain Financial and marketing Plan.                       | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is project report? Describe its elements and significance.                    | <b>07</b> |
|            | <b>b)</b> Explain sole proprietorship and partnership with their advantages and limitations. | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Describe various Steps in setting up a small unit.                                 | <b>07</b> |
|            | <b>b)</b> Explain SIDBI, NABARD, DIC and their role in Development of SMEs.                  | <b>07</b> |

<b>Seat No.</b>	
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- 9) A corporate manager who starts a new initiative for their company which entails setting up a new distinct business unit and board of directors can be regarded as?
  - a) Ecopreneur
  - b) Technopreneur
  - c) Intrapreneur
  - d) Social Entrepreneur
- 10) Which of the following is not a characteristic of an entrepreneur?
  - a) Need for independence
  - b) Need for affiliation
  - c) Need for achievement
  - d) Risk taking
- 11) A business arrangement where one party allows another party to use a business name and sell its products or services is known as \_\_\_\_\_.
  - a) A cooperative.
  - b) A franchise.
  - c) An owner-manager business
  - d) A limited company.
- 12) State Industrial corporations engage in the development of \_\_\_\_\_.
  - a) industrial estates
  - b) institutional estates
  - c) individual investors
  - d) agricultural entrepreneurs
- 13) Business plan is an important \_\_\_\_\_ for entrepreneurs.
  - a) document
  - b) tool
  - c) vision
  - d) mission
- 14) \_\_\_\_\_ Report is a document where in all the details obtained from technical analysis, financial analysis, profitability analysis etc. are put together.
  - a) Feasibility
  - b) Project
  - c) Both
  - d) None

Seat No.	
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Set 

R
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**Fourth. Year (B.Tech.) (Sem– I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Entrepreneurship Development**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Attempt any two questions from each section.  
 2) Neat sketches must be drawn whenever necessary.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Describe the importance and significance of growth of entrepreneurial activity.           | <b>07</b> |
|            | <b>b)</b> Explain various characteristics and qualities of entrepreneurs.                           | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain various factors influencing entrepreneurial development and motivation.           | <b>07</b> |
|            | <b>b)</b> What is EDP? Explain phases and problems faced by EDPs.                                   | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Describe various problems face by potential Entrepreneur and their probable solutions.    | <b>07</b> |
|            | <b>b)</b> What is franchising? Explain its advantages and limitations to franchisor and franchisee. | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What is Idea generation? Describe various sources and methods of idea generation.  | <b>07</b> |
|            | <b>b)</b> What is business plan? Explain Financial and marketing Plan.                       | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is project report? Describe its elements and significance.                    | <b>07</b> |
|            | <b>b)</b> Explain sole proprietorship and partnership with their advantages and limitations. | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Describe various Steps in setting up a small unit.                                 | <b>07</b> |
|            | <b>b)</b> Explain SIDBI, NABARD, DIC and their role in Development of SMEs.                  | <b>07</b> |

Seat No.	
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Set **S**

**Fourth. Year (B.Tech.) (Sem– I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Entrepreneurship Development**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following is not a characteristic of an entrepreneur?
  - a) Need for independence
  - b) Need for affiliation
  - c) Need for achievement
  - d) Risk taking
- 2) A business arrangement where one party allows another party to use a business name and sell its products or services is known as \_\_\_\_\_.
  - a) A cooperative.
  - b) A franchise.
  - c) An owner-manager business
  - d) A limited company.
- 3) State Industrial corporations engage in the development of \_\_\_\_\_.
  - a) industrial estates
  - b) institutional estates
  - c) individual investors
  - d) agricultural entrepreneurs
- 4) Business plan is an important \_\_\_\_\_ for entrepreneurs.
  - a) document
  - b) tool
  - c) vision
  - d) mission
- 5) \_\_\_\_\_ Report is a document where in all the details obtained from technical analysis, financial analysis, profitability analysis etc. are put together.
  - a) Feasibility
  - b) Project
  - c) Both
  - d) None
- 6) To provide financial assistance to entrepreneurs the government has set up a number of \_\_\_\_\_.
  - a) financial advisors
  - b) financial intermediaries
  - c) Industrial estates
  - d) financial institutions
- 7) SIDBI was set up as a subsidiary of \_\_\_\_\_.
  - a) IDBI
  - b) IFCI
  - c) ICICI
  - d) SFC
- 8) District Industries Centres are located \_\_\_\_\_.
  - a) in each district
  - b) in each state
  - c) only in selected districts
  - d) only in selected states
- 9) SIDBI stands for \_\_\_\_\_.
  - a) Small Institutions Development Bank of India
  - b) Small Industries Development Bank of India

- c) Small Industries Derivatives Bank of India
- d) Small Industries Development Bureau of India

**SLR-HL-141**

**Set**

<b>S</b>
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- 10) The term Entrepreneur is derived from the \_\_\_\_\_ word.
  - a) English
  - b) Tamil
  - c) Hindi
  - d) French
- 11) Refusal to adopt and use opportunities to make changes in production \_\_\_\_\_ entrepreneur.
  - a) Fabian
  - b) Imitative
  - c) Innovative
  - d) Drone
- 12) Environmental scanning focuses \_\_\_\_\_
  - a) Profit
  - b) Ideas
  - c) Production
  - d) Creativity
- 13) The person who creates an enterprise is called
  - a) Entrepreneur
  - b) Managers
  - c) Leaders
  - d) Owners
- 14) A corporate manager who starts a new initiative for their company which entails setting up a new distinct business unit and board of directors can be regarded as?
  - a) Ecopreneur
  - b) Technopreneur
  - c) Intrapreneur
  - d) Social Entrepreneur

Seat No.	
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Set

S

**Fourth. Year (B.Tech.) (Sem– I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Entrepreneurship Development**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Attempt any two questions from each section.  
 2) Neat sketches must be drawn whenever necessary.

**Section – I**

- |            |   |           |
|------------|---|-----------|
| <b>Q.2</b> | <b>a)</b> Describe the importance and significance of growth of entrepreneurial activity.           | <b>07</b> |
|            | <b>b)</b> Explain various characteristics and qualities of entrepreneurs.                           | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain various factors influencing entrepreneurial development and motivation.           | <b>07</b> |
|            | <b>b)</b> What is EDP? Explain phases and problems faced by EDPs.                                   | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Describe various problems face by potential Entrepreneur and their probable solutions.    | <b>07</b> |
|            | <b>b)</b> What is franchising? Explain its advantages and limitations to franchisor and franchisee. | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> What is Idea generation? Describe various sources and methods of idea generation.  | <b>07</b> |
|            | <b>b)</b> What is business plan? Explain Financial and marketing Plan.                       | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> What is project report? Describe its elements and significance.                    | <b>07</b> |
|            | <b>b)</b> Explain sole proprietorship and partnership with their advantages and limitations. | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> Describe various Steps in setting up a small unit.                                 | <b>07</b> |
|            | <b>b)</b> Explain SIDBI, NABARD, DIC and their role in Development of SMEs.                  | <b>07</b> |

Seat No.	
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Set	P
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Product Life Cycle Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The sequence of a traditional production supply chain is:
  - a) Supplier-Storage-Product-Storage-Distributor-Retailer-Customer
  - b) Supplier-Storage-Product-Storage-Retailer-Distributor-Customer
  - c) Supplier-Storage-Product-Distributor-Storage-Retailer-Customer
  - d) Storage-Supplier-Product-Storage-Distributor-Retailer-Customer
- 2) The process of product design is:
  - a) Ideation-Drawing- Analysing-Validation.
  - b) Drawing- Ideation - Analysing- Validation.
  - c) Drawing- Analysing- Validation- Ideation.
  - d) Ideation- Validation- Analysing- Drawing.
- 3) The activities of designing and producing a container for a product are known as:
  - a) Purchase-sale
  - b) Presentation
  - c) Promotion
  - d) Packaging
- 4) In which of the following stages of product life cycle a company reduces sales promotion to take advantage of heavy consumer demand?
  - a) Introduction
  - b) Growth
  - c) Maturity
  - d) Decline
- 5) As the product passes through different stages of a product life cycle, the product variety
  - a) increases
  - b) decreases and then increases
  - c) remains the same
  - d) decreases
- 6) Branding of product
  - a) makes it more saleable
  - b) differentiates it from other products in the market
  - c) make it more attractive for customer
  - d) gives customer rebate on MRP



- 7) When two separate companies or two divisions within the same company agree to place both of their respective brands on a particular product or enterprise, this arrangement is termed as
- a) Differential Branding
  - b) Cobranding
  - c) Dual Branding
  - d) Both Cobranding and Dual Branding
- 8) What does the term PLC stands for?
- a) Product life cycle
  - b) Production life cycle
  - c) Product long cycle
  - d) Production long cycle
- 9) When a new product arrives in the market with higher quality, higher value and new features better than its competitors. Such products are known as
- a) Superior products
  - b) Develop superior products
  - c) Unique superior products
  - d) New products
- 10) Which of the following is not a characteristic of "Market Introduction Stage" in PLC?
- a) Demands has to be created
  - b) Costs are low
  - c) Makes no money at this stage
  - d) Slow sales volume to start
  - e) There is little or no competition
- 11) Increased competition leads to price decrease, increasing public awareness, sales volume increase significantly are the characteristics of in PLC
- a) Mature stage
  - b) Decline stage
  - c) Growth stage
  - d) Market introduction stage
- 12) \_\_\_\_\_ includes review of sales, profit projections and cost for a new product, to find out whether it satisfied the company objective or not.
- a) Product Development
  - b) Business Analysis
  - c) Marketing Strategy
  - d) Test Marketing
- 13) Color and size of the product, brand and packaging are considered as
- a) Chemical features of product
  - b) Physical features of product
  - c) Product designing
  - d) Product manufacture
- 14) The most important performance dimension for product development project is
- a) Time to market
  - b) Time to target
  - c) Time to consumer
  - d) Time to seller

Seat No.	
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Set	P
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Product Life Cycle Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Answer any two questions from **section I and Section II.**  
 2) Figures to right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Define PLM. List and explain different phases in PLM.          | <b>07</b> |
|            | <b>b)</b> What is the difference between PLM and ERP?                    | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain PLM Characteristics and scope of PLM.                  | <b>07</b> |
|            | <b>b)</b> What are PLM external drivers and internal drivers?            | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> What is Digital Manufacturing? Definition, Process & Benefits. | <b>07</b> |
|            | <b>b)</b> What is the Need & Significance of PLM?                        | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> Explain the Product life cycle management system, system architecture, Information models and product structure. | <b>07</b> |
|            | <b>b)</b> What is information model and data model?  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the PLM Strategy, Principles for PLM strategy.   | <b>07</b> |
|            | <b>b)</b> What are the Product Data issues in Access, Applications, Arc*hiving Availability, Change, Confidentiality?      | <b>07</b> |
| <b>Q.7</b> | <b>Write Short note on Any Four</b>  | <b>14</b> |
|            | <b>a)</b> Product Structure  |           |
|            | <b>b)</b> Benefits of PLM  |           |
|            | <b>c)</b> Need of PLM  |           |
|            | <b>d)</b> PDM  |           |
|            | <b>e)</b> Stages in NPD (New Product Development)  |           |
|            | <b>f)</b> PLM as Business Strategy   |           |

Seat No.	
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Set Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Product Life Cycle Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What does the term PLC stands for?
 

a) Product life cycle	b) Production life cycle
c) Product long cycle	d) Production long cycle
- 2) When a new product arrives in the market with higher quality, higher value and new features better than its competitors. Such products are known as
 

a) Superior products	b) Develop superior products
c) Unique superior products	d) New products
- 3) Which of the following is not a characteristic of "Market Introduction Stage" in PLC?
 

a) Demands has to be created
b) Costs are low
c) Makes no money at this stage
d) Slow sales volume to start
e) There is little or no competition
- 4) Increased competition leads to price decrease, increasing public awareness, sales volume increase significantly are the characteristics of in PLC
 

a) Mature stage	b) Decline stage
c) Growth stage	d) Market introduction stage
- 5) \_\_\_\_\_ includes review of sales, profit projections and cost for a new product, to find out whether it satisfied the company objective or not.
 

a) Product Development	b) Business Analysis
c) Marketing Strategy	d) Test Marketing
- 6) Color and size of the product, brand and packaging are considered as
 

a) Chemical features of product	b) Physical features of product
c) Product designing	d) Product manufacture
- 7) The most important performance dimension for product development project is
 

a) Time to market	b) Time to target
c) Time to consumer	d) Time to seller

- 8) The sequence of a traditional production supply chain is:
- a) Supplier-Storage-Product-Storage-Distributor-Retailer-Customer
  - b) Supplier-Storage-Product-Storage-Retailer-Distributor-Customer
  - c) Supplier-Storage-Product-Distributor-Storage-Retailer-Customer
  - d) Storage-Supplier-Product-Storage-Distributor-Retailer-Customer
- 9) The process of product design is:
- a) Ideation-Drawing- Analysing-Validation.
  - b) Drawing- Ideation - Analysing- Validation.
  - c) Drawing- Analysing- Validation- Ideation.
  - d) Ideation- Validation- Analysing- Drawing.
- 10) The activities of designing and producing a container for a product are known as:
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  - b) Presentation
  - c) Promotion
  - d) Packaging
- 11) In which of the following stages of product life cycle a company reduces sales promotion to take advantage of heavy consumer demand?
- a) Introduction
  - b) Growth
  - c) Maturity
  - d) Decline
- 12) As the product passes through different stages of a product life cycle, the product variety
- a) increases
  - b) decreases and then increases
  - c) remains the same
  - d) decreases
- 13) Branding of product
- a) makes it more saleable
  - b) differentiates it from other products in the market
  - c) make it more attractive for customer
  - d) gives customer rebate on MRP
- 14) When two separate companies or two divisions within the same company agree to place both of their respective brands on a particular product or enterprise, this arrangement is termed as
- a) Differential Branding
  - b) Cobranding
  - c) Dual Branding
  - d) Both Cobranding and Dual Branding

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Set	Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Product Life Cycle Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Answer any two questions from **section I and Section II**.  
 2) Figures to right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Define PLM. List and explain different phases in PLM.          | <b>07</b> |
|            | <b>b)</b> What is the difference between PLM and ERP?                    | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain PLM Characteristics and scope of PLM.                  | <b>07</b> |
|            | <b>b)</b> What are PLM external drivers and internal drivers?            | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> What is Digital Manufacturing? Definition, Process & Benefits. | <b>07</b> |
|            | <b>b)</b> What is the Need & Significance of PLM?                        | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> Explain the Product life cycle management system, system architecture, Information models and product structure. | <b>07</b> |
|            | <b>b)</b> What is information model and data model?  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the PLM Strategy, Principles for PLM strategy.   | <b>07</b> |
|            | <b>b)</b> What are the Product Data issues in Access, Applications, Arc*hiving Availability, Change, Confidentiality?      | <b>07</b> |
| <b>Q.7</b> | <b>Write Short note on Any Four</b>  | <b>14</b> |
|            | <b>a)</b> Product Structure  |           |
|            | <b>b)</b> Benefits of PLM  |           |
|            | <b>c)</b> Need of PLM  |           |
|            | <b>d)</b> PDM  |           |
|            | <b>e)</b> Stages in NPD (New Product Development)  |           |
|            | <b>f)</b> PLM as Business Strategy   |           |

Seat No.	
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Set	R
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Product Life Cycle Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Increased competition leads to price decrease, increasing public awareness, sales volume increase significantly are the characteristics of in PLC
  - a) Mature stage
  - b) Decline stage
  - c) Growth stage
  - d) Market introduction stage
- 2) \_\_\_\_\_ includes review of sales, profit projections and cost for a new product, to find out whether it satisfied the company objective or not.
  - a) Product Development
  - b) Business Analysis
  - c) Marketing Strategy
  - d) Test Marketing
- 3) Color and size of the product, brand and packaging are considered as
  - a) Chemical features of product
  - b) Physical features of product
  - c) Product designing
  - d) Product manufacture
- 4) The most important performance dimension for product development project is
  - a) Time to market
  - b) Time to target
  - c) Time to consumer
  - d) Time to seller
- 5) The sequence of a traditional production supply chain is:
  - a) Supplier-Storage-Product-Storage-Distributor-Retailer-Customer
  - b) Supplier-Storage-Product-Storage-Retailer-Distributor-Customer
  - c) Supplier-Storage-Product-Distributor-Storage-Retailer-Customer
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  - b) Drawing- Ideation - Analysing- Validation.
  - c) Drawing- Analysing- Validation- Ideation.
  - d) Ideation- Validation- Analysing- Drawing.
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  - a) Purchase-sale
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- 8) In which of the following stages of product life cycle a company reduces sales promotion to take advantage of heavy consumer demand?
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- a) Superior products
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  - c) Unique superior products
  - d) New products
- 14) Which of the following is not a characteristic of "Market Introduction Stage" in PLC?
- a) Demands has to be created
  - b) Costs are low
  - c) Makes no money at this stage
  - d) Slow sales volume to start
  - e) There is little or no competition

Seat No.	
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Set	R
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Product Life Cycle Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Answer any two questions from **section I and Section II.**  
 2) Figures to right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Define PLM. List and explain different phases in PLM.          | <b>07</b> |
|            | <b>b)</b> What is the difference between PLM and ERP?                    | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain PLM Characteristics and scope of PLM.                  | <b>07</b> |
|            | <b>b)</b> What are PLM external drivers and internal drivers?            | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> What is Digital Manufacturing? Definition, Process & Benefits. | <b>07</b> |
|            | <b>b)</b> What is the Need & Significance of PLM?                        | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> Explain the Product life cycle management system, system architecture, Information models and product structure. | <b>07</b> |
|            | <b>b)</b> What is information model and data model?  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the PLM Strategy, Principles for PLM strategy.   | <b>07</b> |
|            | <b>b)</b> What are the Product Data issues in Access, Applications, Arc*hiving Availability, Change, Confidentiality?      | <b>07</b> |
| <b>Q.7</b> | <b>Write Short note on Any Four</b>  | <b>14</b> |
|            | <b>a)</b> Product Structure  |           |
|            | <b>b)</b> Benefits of PLM  |           |
|            | <b>c)</b> Need of PLM  |           |
|            | <b>d)</b> PDM  |           |
|            | <b>e)</b> Stages in NPD (New Product Development)  |           |
|            | <b>f)</b> PLM as Business Strategy   |           |



<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Product Life Cycle Management**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Branding of product
  - a) makes it more saleable
  - b) differentiates it from other products in the market
  - c) make it more attractive for customer
  - d) gives customer rebate on MRP
- 2) When two separate companies or two divisions within the same company agree to place both of their respective brands on a particular product or enterprise, this arrangement is termed as
  - a) Differential Branding
  - b) Cobranding
  - c) Dual Branding
  - d) Both Cobranding and Dual Branding
- 3) What does the term PLC stands for?
  - a) Product life cycle
  - b) Production life cycle
  - c) Product long cycle
  - d) Production long cycle
- 4) When a new product arrives in the market with higher quality, higher value and new features better than its competitors. Such products are known as
  - a) Superior products
  - b) Develop superior products
  - c) Unique superior products
  - d) New products
- 5) Which of the following is not a characteristic of "Market Introduction Stage" in PLC?
  - a) Demands has to be created
  - b) Costs are low
  - c) Makes no money at this stage
  - d) Slow sales volume to start
  - e) There is little or no competition

- 6) Increased competition leads to price decrease, increasing public awareness, sales volume increase significantly are the characteristics of in PLC
- a) Mature stage
  - b) Decline stage
  - c) Growth stage
  - d) Market introduction stage
- 7) \_\_\_\_\_ includes review of sales, profit projections and cost for a new product, to find out whether it satisfied the company objective or not.
- a) Product Development
  - b) Business Analysis
  - c) Marketing Strategy
  - d) Test Marketing
- 8) Color and size of the product, brand and packaging are considered as
- a) Chemical features of product
  - b) Physical features of product
  - c) Product designing
  - d) Product manufacture
- 8) The most important performance dimension for product development project is
- a) Time to market
  - b) Time to target
  - c) Time to consumer
  - d) Time to seller
- 10) The sequence of a traditional production supply chain is:
- a) Supplier-Storage-Product-Storage-Distributor-Retailer-Customer
  - b) Supplier-Storage-Product-Storage-Retailer-Distributor-Customer
  - c) Supplier-Storage-Product-Distributor-Storage-Retailer-Customer
  - d) Storage-Supplier-Product-Storage-Distributor-Retailer-Customer
- 11) The process of product design is:
- a) Ideation-Drawing- Analysing-Validation.
  - b) Drawing- Ideation - Analysing- Validation.
  - c) Drawing- Analysing- Validation- Ideation.
  - d) Ideation- Validation- Analysing- Drawing.
- 12) The activities of designing and producing a container for a product are known as:
- a) Purchase-sale
  - b) Presentation
  - c) Promotion
  - d) Packaging
- 13) In which of the following stages of product life cycle a company reduces sales promotion to take advantage of heavy consumer demand?
- a) Introduction
  - b) Growth
  - c) Maturity
  - d) Decline
- 14) As the product passes through different stages of a product life cycle, the product variety
- a) increases
  - b) decreases and then increases
  - c) remains the same
  - d) decreases

Seat No.	
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Set 

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Product Life Cycle Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Answer any two questions from **section I and Section II.**  
 2) Figures to right indicate full marks.

**Section – I**

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | <b>a)</b> Define PLM. List and explain different phases in PLM.          | <b>07</b> |
|            | <b>b)</b> What is the difference between PLM and ERP?                    | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain PLM Characteristics and scope of PLM.                  | <b>07</b> |
|            | <b>b)</b> What are PLM external drivers and internal drivers?            | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> What is Digital Manufacturing? Definition, Process & Benefits. | <b>07</b> |
|            | <b>b)</b> What is the Need & Significance of PLM?                        | <b>07</b> |

**Section – II**

- |            |  |           |
|------------|--|-----------|
| <b>Q.5</b> | <b>a)</b> Explain the Product life cycle management system, system architecture, Information models and product structure. | <b>07</b> |
|            | <b>b)</b> What is information model and data model?  | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain the PLM Strategy, Principles for PLM strategy.   | <b>07</b> |
|            | <b>b)</b> What are the Product Data issues in Access, Applications, Arc*hiving Availability, Change, Confidentiality?      | <b>07</b> |
| <b>Q.7</b> | <b>Write Short note on Any Four</b>  | <b>14</b> |
|            | <b>a)</b> Product Structure  |           |
|            | <b>b)</b> Benefits of PLM  |           |
|            | <b>c)</b> Need of PLM  |           |
|            | <b>d)</b> PDM  |           |
|            | <b>e)</b> Stages in NPD (New Product Development)  |           |
|            | <b>f)</b> PLM as Business Strategy   |           |

Seat No.	
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Set

P

**T.Y.(B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The process of converting the analog sample into discrete form is called
  - a) Modulation
  - b) Multiplexing
  - c) Quantization
  - d) Sampling
- 2) The characteristics of compressor in  $\mu$ -law companding are
  - a) Continuous in nature
  - b) Logarithmic in nature
  - c) Linear in nature
  - d) Discrete in nature
- 3) The error probability of a PCM is
  - a) Calculated using noise and inter symbol interference
  - b) Gaussian noise + error component due to inter symbol interference
  - c) Calculated using power spectral density
  - d) All of the above
- 4) For a binary symmetric channel, the random bits are given as
  - a) Logic 1 given by probability P and logic 0 by (1-P)
  - b) Logic 1 given by probability 1-P and logic 0 by P
  - c) Logic 1 given by probability P<sup>2</sup> and logic 0 by 1-P
  - d) Logic 1 given by probability P and logic 0 by (1 -P)<sup>2</sup>
- 5) Information rate is defined as
  - a) Information per unit time
  - b) Average number of bits of information per second
  - c) rH
  - d) All of the above
- 6) If two events are statistically independent then  $P(AB) = \underline{\hspace{2cm}}$ .
  - a) P(A)
  - b)  $P(B/A) \times P(A)$
  - c)  $P(A) \times P(B)$
  - d)  $P(A) + P(B)$
- 7) For hamming distance  $d_{min}$  and t errors in the received word, the condition to be able to correct the errors is
  - a)  $2t + 1 \leq d_{min}$
  - b)  $2t + 2 \leq d_{min}$
  - c)  $2t + 1 \leq 2d_{min}$
  - d) Both a and b

- 8) In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of
- a)  $\pi/2$
  - b)  $\pi$
  - c)  $2\pi$
  - d) 0
- 9) ASK modulated signal has the bandwidth
- a) Same as the bandwidth of baseband signal
  - b) Half the bandwidth of baseband signal
  - c) Double the bandwidth of baseband signal
  - d) None of the above
- 10) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.
- a) Higher
  - b) Lower
  - c) Same
  - d) Not predictable
- 11) In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates
- a) No carrier
  - b) Half the carrier amplitude
  - c) Amplitude of modulating signal
  - d) None of the above
- 12) For M equally likely messages,  $M \gg 1$ , if the rate of information  $R > C$ , the probability of error is
- a) Arbitrarily small
  - b) Close to unity
  - c) Not predictable
  - d) Unknown
- 13) Costas loop is a method for
- a) Frame synchronization
  - b) Carrier synchronization
  - c) Symbol synchronization
  - d) None of these
- 14) Why spread spectrum technique is inefficient for a single user?
- a) Large transmission bandwidth
  - b) Small transmission bandwidth
  - c) Fixed transmission bandwidth
  - d) Fixed null bandwidth

Seat No.	
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Set	P
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**T.Y.(B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
 2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Two of the following.** **12**

- Given the alphabets with probabilities {0.4, 0.2, 0.2, 0.1, 0.1} calculate efficiency using Huffman codes Technique and Shannon Fanno coding Technique. Compare the result.
- Illustrate with a neat diagram PCM Generation and PCM Regeneration technique.
- Illustrate with a neat diagram Baseband binary data Transmission.

**Q.3 Attempt any Four of the following** **16**

- Discuss the different types of Sampling.
- What are the drawbacks of delta modulation? How they can be reduced.
- In a binary PCM a 'zero' occurs with probability 1/4 and 'one' occurs with probability 3/4, calculate information carried by each bit.
- Explain ISI problem how it can be reduced.
- Discuss why Quantization is important in Digital Communication & its types in brief

**Section - II**

**Q.4 Attempt Any Two of the following.** **12**

- With suitable diagram explain DSSS transmitter & receiver
- The generation matrix for (6,3) block code is given below find all code vectors of this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

What is the minimum distance between the code vectors?

How many errors can be detected? How many errors can be correct?

- With suitable waveforms explain QPSK & OQPSK.

**Q.5 Attempt Any Four of the following** **16**

- Explain with block diagram QAM.
- Explain with block diagram DPSK modulator and demodulator.
- State advantages and disadvantages of spread spectrum techniques.
- For message  $M = [0 \ 1 \ 0 \ 1]$  and  $g(x) = 1 + x + x^3$  show a systematic (7,4) cyclic code encoder circuit and stepwise encoding of M.
- Explain optimum receiver

Seat No.	
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Set Q
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**T.Y.(B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of
 

a) $\Pi/2$	b) $\Pi$
c) $2\Pi$	d) 0
- 2) ASK modulated signal has the bandwidth
 

a) Same as the bandwidth of baseband signal
b) Half the bandwidth of baseband signal
c) Double the bandwidth of baseband signal
d) None of the above
- 3) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.
 

a) Higher	b) Lower
c) Same	d) Not predictable
- 4) In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates
 

a) No carrier
b) Half the carrier amplitude
c) Amplitude of modulating signal
d) None of the above
- 5) For M equally likely messages,  $M \gg 1$ , if the rate of information  $R > C$ , the probability of error is
 

a) Arbitrarily small	b) Close to unity
c) Not predictable	d) Unknown
- 6) Costas loop is a method for
 

a) Frame synchronization	b) Carrier synchronization
c) Symbol synchronization	d) None of these

- 7) Why spread spectrum technique is inefficient for a single user?
- Large transmission bandwidth
  - Small transmission bandwidth
  - Fixed transmission bandwidth
  - Fixed null bandwidth
- 8) The process of converting the analog sample into discrete form is called
- Modulation
  - Multiplexing
  - Quantization
  - Sampling
- 9) The characteristics of compressor in  $\mu$ -law companding are
- Continuous in nature
  - Logarithmic in nature
  - Linear in nature
  - Discrete in nature
- 10) The error probability of a PCM is
- Calculated using noise and inter symbol interference
  - Gaussian noise + error component due to inter symbol interference
  - Calculated using power spectral density
  - All of the above
- 11) For a binary symmetric channel, the random bits are given as
- Logic 1 given by probability P and logic 0 by (1-P)
  - Logic 1 given by probability 1-P and logic 0 by P
  - Logic 1 given by probability  $P^2$  and logic 0 by 1-P
  - Logic 1 given by probability P and logic 0 by  $(1-P)^2$
- 12) Information rate is defined as
- Information per unit time
  - Average number of bits of information per second
  - $rH$
  - All of the above
- 13) If two events are statistically independent then  $P(AB) = \underline{\hspace{2cm}}$ .
- $P(A)$
  - $P(B/A) \times P(A)$
  - $P(A) \times P(B)$
  - $P(A) + P(B)$
- 14) For hamming distance  $d_{min}$  and  $t$  errors in the received word, the condition to be able to correct the errors is
- $2t + 1 \leq d_{min}$
  - $2t + 2 \leq d_{min}$
  - $2t + 1 \leq 2d_{min}$
  - Both a and b



Seat No.	
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Set **Q**

**T.Y.(B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
 2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Two of the following.** **12**

- Given the alphabets with probabilities {0.4, 0.2, 0.2, 0.1, 0.1} calculate efficiency using Huffman codes Technique and Shannon Fanno coding Technique. Compare the result.
- Illustrate with a neat diagram PCM Generation and PCM Regeneration technique.
- Illustrate with a neat diagram Baseband binary data Transmission.

**Q.3 Attempt any Four of the following** **16**

- Discuss the different types of Sampling.
- What are the drawbacks of delta modulation? How they can be reduced.
- In a binary PCM a 'zero' occurs with probability 1/4 and 'one' occurs with probability 3/4, calculate information carried by each bit.
- Explain ISI problem how it can be reduced.
- Discuss why Quantization is important in Digital Communication & its types in brief

**Section - II**

**Q.4 Attempt Any Two of the following.** **12**

- With suitable diagram explain DSSS transmitter & receiver
- The generation matrix for (6,3) block code is given below find all code vectors of this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

What is the minimum distance between the code vectors?

How many errors can be detected? How many errors can be correct?

- With suitable waveforms explain QPSK & OQPSK.

**Q.5 Attempt Any Four of the following** **16**

- Explain with block diagram QAM.
- Explain with block diagram DPSK modulator and demodulator.
- State advantages and disadvantages of spread spectrum techniques.
- For message  $M = [0 \ 1 \ 0 \ 1]$  and  $g(x) = 1 + x + x^3$  show a systematic (7,4) cyclic code encoder circuit and stepwise encoding of M.
- Explain optimum receiver

Seat No.	
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Set	R
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**T.Y.(B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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 4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates
  - a) No carrier
  - b) Half the carrier amplitude
  - c) Amplitude of modulating signal
  - d) None of the above
- 2) For M equally likely messages,  $M \gg 1$ , if the rate of information  $R > C$ , the probability of error is
 

a) Arbitrarily small	b) Close to unity
c) Not predictable	d) Unknown
- 3) Costas loop is a method for
 

a) Frame synchronization	b) Carrier synchronization
c) Symbol synchronization	d) None of these
- 4) Why spread spectrum technique is inefficient for a single user?
 

a) Large transmission bandwidth	b) Small transmission bandwidth
c) Fixed transmission bandwidth	d) Fixed null bandwidth
- 5) The process of converting the analog sample into discrete form is called
 

a) Modulation	b) Multiplexing
c) Quantization	d) Sampling
- 6) The characteristics of compressor in  $\mu$ -law companding are
 

a) Continuous in nature	b) Logarithmic in nature
c) Linear in nature	d) Discrete in nature
- 7) The error probability of a PCM is
  - a) Calculated using noise and inter symbol interference
  - b) Gaussian noise + error component due to inter symbol interference
  - c) Calculated using power spectral density
  - d) All of the above

- 8) For a binary symmetric channel, the random bits are given as
- Logic 1 given by probability  $P$  and logic 0 by  $(1-P)$
  - Logic 1 given by probability  $1-P$  and logic 0 by  $P$
  - Logic 1 given by probability  $P^2$  and logic 0 by  $1-P$
  - Logic 1 given by probability  $P$  and logic 0 by  $(1-P)^2$
- 9) Information rate is defined as
- Information per unit time
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  - $rH$
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- 10) If two events are statistically independent then  $P(AB) = \underline{\hspace{2cm}}$ .
- $P(A)$
  - $P(B/A) \times P(A)$
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- 11) For hamming distance  $d_{min}$  and  $t$  errors in the received word, the condition to be able to correct the errors is
- $2t + 1 \leq d_{min}$
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  - Both a and b
- 12) In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of
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  - $\pi$
  - $2\pi$
  - 0
- 13) ASK modulated signal has the bandwidth
- Same as the bandwidth of baseband signal
  - Half the bandwidth of baseband signal
  - Double the bandwidth of baseband signal
  - None of the above
- 14) The probability of error of DPSK is        than that of BPSK.
- Higher
  - Lower
  - Same
  - Not predictable

Seat No.	
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**T.Y.(B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
 2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Two of the following.** **12**

- Given the alphabets with probabilities {0.4, 0.2, 0.2, 0.1, 0.1} calculate efficiency using Huffman codes Technique and Shannon Fanno coding Technique. Compare the result.
- Illustrate with a neat diagram PCM Generation and PCM Regeneration technique.
- Illustrate with a neat diagram Baseband binary data Transmission.

**Q.3 Attempt any Four of the following** **16**

- Discuss the different types of Sampling.
- What are the drawbacks of delta modulation? How they can be reduced.
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- Explain ISI problem how it can be reduced.
- Discuss why Quantization is important in Digital Communication & its types in brief

**Section - II**

**Q.4 Attempt Any Two of the following.** **12**

- With suitable diagram explain DSSS transmitter & receiver
- The generation matrix for (6,3) block code is given below find all code vectors of this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

What is the minimum distance between the code vectors?

How many errors can be detected? How many errors can be correct?

- With suitable waveforms explain QPSK & OQPSK.

**Q.5 Attempt Any Four of the following** **16**

- Explain with block diagram QAM.
- Explain with block diagram DPSK modulator and demodulator.
- State advantages and disadvantages of spread spectrum techniques.
- For message  $M = [0 \ 1 \ 0 \ 1]$  and  $g(x) = 1 + x + x^3$  show a systematic (7,4) cyclic code encoder circuit and stepwise encoding of M.
- Explain optimum receiver

<b>Seat No.</b>	
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# Digital Communication

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks.
- 4) Assume data wherever necessary

### MCQ/Objective Type Questions

Marks:14

14

- 1) If two events are statistically independent then  $P(AB)=$  \_\_\_\_\_.  
a)  $P(A)$                                       b)  $P(B/A) \times P(A)$   
c)  $P(A) \times P(B)$                             d)  $P(A) + P(B)$
- 2) For hamming distance  $d_{min}$  and  $t$  errors in the received word, the condition to be able to correct the errors is  
a)  $2t + 1 \leq d_{min}$                           b)  $2t + 2 \leq d_{min}$   
c)  $2t + 1 \leq 2d_{min}$                         d) Both a and b
- 3) In Binary Phase Shift Keying system, the binary symbols 1 and 0 are represented by carrier with phase shift of  
a)  $\pi/2$     b)  $\pi$   
c)  $2\pi$     d) 0
- 4) ASK modulated signal has the bandwidth  
a) Same as the bandwidth of baseband signal  
b) Half the bandwidth of baseband signal  
c) Double the bandwidth of baseband signal  
d) None of the above
- 5) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.  
a) Higher                                      b) Lower  
c) Same                                         d) Not predictable
- 6) In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates  
a) No carrier  
b) Half the carrier amplitude  
c) Amplitude of modulating signal  
d) None of the above

- 7) For  $M$  equally likely messages,  $M \gg 1$ , if the rate of information  $R > C$ , the probability of error is
- a) Arbitrarily small
  - b) Close to unity
  - c) Not predictable
  - d) Unknown
- 8) Costas loop is a method for
- a) Frame synchronization
  - b) Carrier synchronization
  - c) Symbol synchronization
  - d) None of these
- 9) Why spread spectrum technique is inefficient for a single user?
- a) Large transmission bandwidth
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  - c) Fixed transmission bandwidth
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- 10) The process of converting the analog sample into discrete form is called
- a) Modulation
  - b) Multiplexing
  - c) Quantization
  - d) Sampling
- 11) The characteristics of compressor in  $\mu$ -law companding are
- a) Continuous in nature
  - b) Logarithmic in nature
  - c) Linear in nature
  - d) Discrete in nature
- 12) The error probability of a PCM is
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  - b) Gaussian noise + error component due to inter symbol interference
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- a) Logic 1 given by probability  $P$  and logic 0 by  $(1-P)$
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  - c) Logic 1 given by probability  $P^2$  and logic 0 by  $1-P$
  - d) Logic 1 given by probability  $P$  and logic 0 by  $(1-P)^2$
- 14) Information rate is defined as
- a) Information per unit time
  - b) Average number of bits of information per second
  - c)  $rH$
  - d) All of the above

Seat No.	
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Set **S**

**T.Y.(B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
 2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Two of the following.** **12**

- Given the alphabets with probabilities {0.4, 0.2, 0.2, 0.1, 0.1} calculate efficiency using Huffman codes Technique and Shannon Fanno coding Technique. Compare the result.
- Illustrate with a neat diagram PCM Generation and PCM Regeneration technique.
- Illustrate with a neat diagram Baseband binary data Transmission.

**Q.3 Attempt any Four of the following** **16**

- Discuss the different types of Sampling.
- What are the drawbacks of delta modulation? How they can be reduced.
- In a binary PCM a 'zero' occurs with probability 1/4 and 'one' occurs with probability 3/4, calculate information carried by each bit.
- Explain ISI problem how it can be reduced.
- Discuss why Quantization is important in Digital Communication & its types in brief

**Section - II**

**Q.4 Attempt Any Two of the following.** **12**

- With suitable diagram explain DSSS transmitter & receiver
- The generation matrix for (6,3) block code is given below find all code vectors of this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

What is the minimum distance between the code vectors?

How many errors can be detected? How many errors can be correct?

- With suitable waveforms explain QPSK & OQPSK.

**Q.5 Attempt Any Four of the following** **16**

- Explain with block diagram QAM.
- Explain with block diagram DPSK modulator and demodulator.
- State advantages and disadvantages of spread spectrum techniques.
- For message  $M = [0 \ 1 \ 0 \ 1]$  and  $g(x) = 1 + x + x^3$  show a systematic (7,4) cyclic code encoder circuit and stepwise encoding of M.
- Explain optimum receiver

\_\_\_\_\_

## Max. Marks: 70

14

- Page 1 of 16



- 9) The FIR filter of order M gives linear phase response if \_\_\_\_\_.
  - a)  $h(n) < \infty$
  - b)  $h(n) = h(-n)$
  - c)  $h(n) = h(M - 1 - n)$
  - d) None of these
- 10) The mapping at bilinear transformation is \_\_\_\_\_.
  - a) One to one mapping
  - b) Many to one mapping
  - c) Many to many mapping
  - d) None of the above
- 11) Butterworth filters have \_\_\_\_\_.
  - a) Wide transition region
  - b) Sharp transition region
  - c) Oscillation in transition region
  - d) Maximally flat passband
- 12) Which realization method minimizes the delay elements?
  - a) Direct form-I
  - b) Direct form-II
  - c) Cascade
  - d) Parallel
- 13) Which of the following properties are true for an IIR filter designed using bilinear Transform method?
  - a) Requires the use of anti aliasing filter
  - b) Requires prewarping the filter cutoff frequencies
  - c) Not suited for the design of HP filters
  - d) Results in unique mapping from analog to digital frequencies
- 14) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.
  - a) Indirect addressing
  - b) Circular mode addressing
  - c) Bit reversed addressing
  - d) Memory mapped addressing

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P

**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four**

20

- Draw and explain the block diagram of DSP system
- The first five points of the 8 Point DFT of a real valued sequence are  $\{28, -4 + j9.565, -4 + j4, -4 + j1.656, -4\}$ . Determine remaining three points.
- Draw direct form realization structure of the system whose impulse response is  $h(n) = \{1, 3, -2, 4, 5\}$
- Find the circular convolution of the two finite duration sequences  $x_1(n) = \{1, -1, -2, 3, -1\}$   $x_2(n) = \{1, 2, 3\}$ .
- Consider the signal  $X(n) = \{1, 4, 5, 2, -4, 6\}$ , obtain following sequences  
 $x_1(n) = x((-n))_6$   
 $x_2(n) = x((n - 2))_6$   
 $x_3(n) = x((n + 1))_6$

**Q.3 Attempt any one.**

08

- Find the output  $y(n)$  of a filter whose impulse response is  $h(n) = \{1, 1, 1\}$  and input signal  $x(n) = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$  using overlap save method.
- Find DFT of the sequence  $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$  using DIT FFT algorithm.

**Section – II**

**Q.4 Answer any four questions.**

20

- Compare FIR filters & IIR filters. Why IIR filters cannot give linear phase characteristics? Explain.
- Given  $\alpha_p = 2$  dB,  $\alpha_s = 10$  dB,  $\Omega_p = 20$  rad/sec,  $\Omega_s = 30$  rad/sec. Determine the order of the Butterworth filter.
- Explain in detail the Multiply and Accumulate (MAC) unit of digital signal processor.
- Draw and explain the structure for  $4 \times 4$  Barrel Multiplier for unsigned numbers.
- Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.

**Q.5 Attempt any one.**

- a) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} e^{-2j\omega} & -\frac{\pi}{4} \leq \omega \leq \frac{\pi}{4} \\ 0 & \frac{\pi}{4} \leq |\omega| \leq \frac{\pi}{4} \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using symmetric Rectangular window of length 5.

- b) Explain steps for designing IIR filter using Impulse Invariance method. For the analog transfer function  $H(s) = \frac{1}{(s+1)(s+2)}$  determine  $H(z)$  using impulse Invariance method. Assume  $T = 1$  sec.

Seat No.	
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Set Q
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not true for IIR filters \_\_\_\_\_.
  - a) Impulse response duration is infinite
  - b) They have poles
  - c) They give linear phase response
  - d) None of above
- 2) The FIR filter of order M gives linear phase response if \_\_\_\_\_.
  - a)  $h(n) < \infty$
  - b)  $h(n) = h(-n)$
  - c)  $h(n) = h(M - 1 - n)$
  - d) None of these
- 3) The mapping at bilinear transformation is \_\_\_\_\_.
  - a) One to one mapping
  - b) Many to one mapping
  - c) Many to many mapping
  - d) None of the above
- 4) Butterworth filters have \_\_\_\_\_.
  - a) Wide transition region
  - b) Sharp transition region
  - c) Oscillation in transition region
  - d) Maximally flat passband
- 5) Which realization method minimizes the delay elements?
  - a) Direct form-I
  - b) Direct form-II
  - c) Cascade
  - d) Parallel
- 6) Which of the following properties are true for an IIR filter designed using bilinear Transform method?
  - a) Requires the use of anti aliasing filter
  - b) Requires prewarping the filter cutoff frequencies
  - c) Not suited for the design of HP filters
  - d) Results in unique mapping from analog to digital frequencies
- 7) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.
  - a) Indirect addressing
  - b) Circular mode addressing
  - c) Bit reversed addressing
  - d) Memory mapped addressing
- 8) The value of the twiddle factor  $W_8^{13}$  is \_\_\_\_\_.
  - a)  $-j$
  - b)  $1$
  - c)  $-0.707 + j 0.707$
  - d)  $j$



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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four** **20**

- Draw and explain the block diagram of DSP system
- The first five points of the 8 Point DFT of a real valued sequence are  $\{28, -4 + j9.565, -4 + j4, -4 + j1.656, -4\}$ . Determine remaining three points.
- Draw direct form realization structure of the system whose impulse response is  $h(n) = \{1, 3, -2, 4, 5\}$
- Find the circular convolution of the two finite duration sequences  $x_1(n) = \{1, -1, -2, 3, -1\}$   $x_2(n) = \{1, 2, 3\}$ .
- Consider the signal  $X(n) = \{1, 4, 5, 2, -4, 6\}$ , obtain following sequences  
 $x_1(n) = x((-n))_6$   
 $x_2(n) = x((n - 2))_6$   
 $x_3(n) = x((n + 1))_6$

**Q.3 Attempt any one.** **08**

- Find the output  $y(n)$  of a filter whose impulse response is  $h(n) = \{1, 1, 1\}$  and input signal  $x(n) = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$  using overlap save method.
- Find DFT of the sequence  $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$  using DIT FFT algorithm.

**Section – II**

**Q.4 Answer any four questions.** **20**

- Compare FIR filters & IIR filters. Why IIR filters cannot give linear phase characteristics? Explain.
- Given  $\alpha_p = 2$  dB,  $\alpha_s = 10$  dB,  $\Omega_p = 20$  rad/sec,  $\Omega_s = 30$  rad/sec. Determine the order of the Butterworth filter.
- Explain in detail the Multiply and Accumulate (MAC) unit of digital signal processor.
- Draw and explain the structure for  $4 \times 4$  Barrel Multiplier for unsigned numbers.
- Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.

**Q.5 Attempt any one.**

- a) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} e^{-2j\omega} & -\frac{\pi}{4} \leq \omega \leq \frac{\pi}{4} \\ 0 & \frac{\pi}{4} \leq |\omega| \leq \frac{\pi}{4} \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using symmetric Rectangular window of length 5.

- b) Explain steps for designing IIR filter using Impulse Invariance method. For the analog transfer function  $H(s) = \frac{1}{(s+1)(s+2)}$  determine  $H(z)$  using impulse Invariance method. Assume  $T = 1$  sec.

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Set R
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Butterworth filters have \_\_\_\_\_.  
 a) Wide transition region                      b) Sharp transition region  
 c) Oscillation in transition region          d) Maximally flat passband
- 2) Which realization method minimizes the delay elements?  
 a) Direct form-I                                      b) Direct form-II  
 c) Cascade    d) Parallel
- 3) Which of the following properties are true for an IIR filter designed using bilinear Transform method?  
 a) Requires the use of anti aliasing filter  
 b) Requires prewarping the filter cutoff frequencies  
 c) Not suited for the design of HP filters  
 d) Results in unique mapping from analog to digital frequencies
- 4) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.  
 a) Indirect addressing                              b) Circular mode addressing  
 c) Bit reversed addressing                        d) Memory mapped addressing
- 5) The value of the twiddle factor  $W_8^{13}$  is \_\_\_\_\_.  
 a)  $-j$     b)  $1$   
 c)  $-0.707 + j 0.707$                                 d)  $j$
- 6) With signal  $x(n) = \{2, 4, 5, 7, 6\}$ , if  $x_1(n) = x((n-2))_5$  then  $x_1(n)$  will be \_\_\_\_\_.  
 a)  $\{5, 7, 6, 2, 4\}$                                       b)  $\{7, 6, 2, 4, 5\}$   
 c)  $\{4, 5, 7, 6, 4\}$                                       d)  $\{2, 4, 5, 7, 6, 8\}$
- 7) If the sequence  $x(n)$  is of finite duration then ROC is entire Z plane, except possibly \_\_\_\_\_.  
 a)  $z = 0$     b)  $z = \infty$   
 c)  $z = 0$  and/or  $z = \infty$                         d)  $z = 0$  and  $z = \infty$



- 8) The magnitude response for DFT exhibits complex conjugate property if time sequence is \_\_\_\_\_.  
a) A real sequence                      b) A complex sequence  
c) An imaginary sequence            d) Not a real sequence
- 9) Decimation in time FFT decimates \_\_\_\_\_.  
a) DFT coefficients                      b) Input sequence  
c) Both sequence and DFT            d) None
- 10) Circular convolution can be performed using the methods \_\_\_\_\_.  
a) Concentric Circle                      b) Matrix Multiplication  
c) Both a & b                                d) None of above
- 11) DIT algorithm related to \_\_\_\_\_.  
a)  $x(k)$  shuffled                          b)  $x(n)$  shuffled  
c)  $x(k)$  and  $X(n)$  shuffled            d) None
- 12) Which of the following is not true for IIR filters \_\_\_\_\_.  
a) Impulse response duration is infinite  
b) They have poles  
c) They give linear phase response  
d) None of above
- 13) The FIR filter of order M gives linear phase response if \_\_\_\_\_.  
a)  $h(n) < \infty$                               b)  $h(n) = h(-n)$   
c)  $h(n) = h(M - 1 - n)$               d) None of these
- 14) The mapping at bilinear transformation is \_\_\_\_\_.  
a) One to one mapping                      b) Many to one mapping  
c) Many to many mapping                d) None of the above

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four** **20**

- Draw and explain the block diagram of DSP system
- The first five points of the 8 Point DFT of a real valued sequence are  $\{28, -4 + j9.565, -4 + j4, -4 + j1.656, -4\}$ . Determine remaining three points.
- Draw direct form realization structure of the system whose impulse response is  $h(n) = \{1, 3, -2, 4, 5\}$
- Find the circular convolution of the two finite duration sequences  $x_1(n) = \{1, -1, -2, 3, -1\}$   $x_2(n) = \{1, 2, 3\}$ .
- Consider the signal  $X(n) = \{1, 4, 5, 2, -4, 6\}$ , obtain following sequences  
 $x_1(n) = x((-n))_6$   
 $x_2(n) = x((n - 2))_6$   
 $x_3(n) = x((n + 1))_6$

**Q.3 Attempt any one.** **08**

- Find the output  $y(n)$  of a filter whose impulse response is  $h(n) = \{1, 1, 1\}$  and input signal  $x(n) = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$  using overlap save method.
- Find DFT of the sequence  $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$  using DIT FFT algorithm.

**Section – II**

**Q.4 Answer any four questions.** **20**

- Compare FIR filters & IIR filters. Why IIR filters cannot give linear phase characteristics? Explain.
- Given  $\alpha_p = 2$  dB,  $\alpha_s = 10$  dB,  $\Omega_p = 20$  rad/sec,  $\Omega_s = 30$  rad/sec. Determine the order of the Butterworth filter.
- Explain in detail the Multiply and Accumulate (MAC) unit of digital signal processor.
- Draw and explain the structure for  $4 \times 4$  Barrel Multiplier for unsigned numbers.
- Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.

**Q.5 Attempt any one.**

- a) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} e^{-2j\omega} & -\frac{\pi}{4} \leq \omega \leq \frac{\pi}{4} \\ 0 & \frac{\pi}{4} \leq |\omega| \leq \frac{\pi}{4} \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using symmetric Rectangular window of length 5.

- b) Explain steps for designing IIR filter using Impulse Invariance method. For the analog transfer function  $H(s) = \frac{1}{(s+1)(s+2)}$  determine  $H(z)$  using impulse Invariance method. Assume  $T = 1$  sec.

\_\_\_\_\_

- 9) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.  
 a) Indirect addressing                      b) Circular mode addressing  
 c) Bit reversed addressing                d) Memory mapped addressing
- 10) The value of the twiddle factor  $W_8^{13}$  is \_\_\_\_\_.  
 a)  $-j$     b)  $1$   
 c)  $-0.707 + j 0.707$                       d)  $j$
- 11) With signal  $x(n) = \{2, 4, 5, 7, 6\}$ , if  $x_1(n) = x((n - 2))_5$  then  $x_1(n)$  will be \_\_\_\_\_.  
 a)  $\{5, 7, 6, 2, 4\}$                               b)  $\{7, 6, 2, 4, 5\}$   
 c)  $\{4, 5, 7, 6, 4\}$                               d)  $\{2, 4, 5, 7, 68\}$
- 12) If the sequence  $x(n)$  is of finite duration then ROC is entire Z plane, except possibly \_\_\_\_\_.  
 a)  $z = 0$     b)  $z = \infty$   
 c)  $z = 0$  and/or  $z = \infty$                       d)  $z = 0$  and  $z = \infty$
- 13) The magnitude response for DFT exhibits complex conjugate property if time sequence is \_\_\_\_\_.  
 a) A real sequence                              b) A complex sequence  
 c) An imaginary sequence                      d) Not a real sequence
- 14) Decimation in time FFT decimates \_\_\_\_\_.  
 a) DFT coefficients                              b) Input sequence  
 c) Both sequence and DFT                      d) None

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four** **20**

- Draw and explain the block diagram of DSP system
- The first five points of the 8 Point DFT of a real valued sequence are  $\{28, -4 + j9.565, -4 + j4, -4 + j1.656, -4\}$ . Determine remaining three points.
- Draw direct form realization structure of the system whose impulse response is  $h(n) = \{1, 3, -2, 4, 5\}$
- Find the circular convolution of the two finite duration sequences  $x_1(n) = \{1, -1, -2, 3, -1\}$   $x_2(n) = \{1, 2, 3\}$ .
- Consider the signal  $X(n) = \{1, 4, 5, 2, -4, 6\}$ , obtain following sequences  
 $x_1(n) = x((-n))_6$   
 $x_2(n) = x((n - 2))_6$   
 $x_3(n) = x((n + 1))_6$

**Q.3 Attempt any one.** **08**

- Find the output  $y(n)$  of a filter whose impulse response is  $h(n) = \{1, 1, 1\}$  and input signal  $x(n) = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$  using overlap save method.
- Find DFT of the sequence  $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$  using DIT FFT algorithm.

**Section – II**

**Q.4 Answer any four questions.** **20**

- Compare FIR filters & IIR filters. Why IIR filters cannot give linear phase characteristics? Explain.
- Given  $\alpha_p = 2$  dB,  $\alpha_s = 10$  dB,  $\Omega_p = 20$  rad/sec,  $\Omega_s = 30$  rad/sec. Determine the order of the Butterworth filter.
- Explain in detail the Multiply and Accumulate (MAC) unit of digital signal processor.
- Draw and explain the structure for  $4 \times 4$  Barrel Multiplier for unsigned numbers.
- Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.

**Q.5 Attempt any one.**

- a) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} e^{-2j\omega} & -\frac{\pi}{4} \leq \omega \leq \frac{\pi}{4} \\ 0 & \frac{\pi}{4} \leq |\omega| \leq \frac{\pi}{4} \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using symmetric Rectangular window of length 5.

- b) Explain steps for designing IIR filter using Impulse Invariance method. For the analog transfer function  $H(s) = \frac{1}{(s+1)(s+2)}$  determine  $H(z)$  using impulse Invariance method. Assume  $T = 1$  sec.

**Seat  
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- 9) Operating CCP1 module in PWM mode, PWM period can be set by writing to \_\_\_\_\_ register.
- |        |           |
|--------|-----------|
| a) PR1 | b) TMR2   |
| c) PR2 | d) CCP1RL |
- 10) In PIC to make Port B an input port, we must place \_\_\_\_\_ in register \_\_\_\_\_.  
a) 00 h, PORTB                      b) FF h, PORTB  
c) 00 h, TRISB                      d) FF h, TRISB
- 11) In PIC 16F877 interrupt vector is at \_\_\_\_\_ in program memory.  
a) 0000 h                              b) 0004 h  
c) 0040 h                              d) 0400 h
- 12) If IRP bit of STATUS register is set, then \_\_\_\_\_ will gets selected.  
a) Bank 0                              b) Bank 1  
c) Bank 2 or 3                      d) Bank 0 or 1
- 13) What is the address of the last location of on-chip flash program memory for PIC 16F877?  
a) 0FFF h                              b) 1FFF h  
c) FFFF h                              d) 7FFF h
- 14) The file with the \_\_\_\_\_ extension is downloaded into PIC ROM.  
a) hex                                  b) asm  
c) obj                                  d) all

Seat No.	
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Set

P

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any four questions. 16**

- List the three buses found in computer systems and state briefly the purpose of each bus.
- What is the purpose of program counter, stack pointer and instruction decoder?
- What are the CPU different registers and their purpose in 8051 microcontroller?
- Define addressing mode. Explain the different addressing modes in 8051 with suitable example.
- Draw and explain the bit formats of TMOD and TCON registers.

**Q.3 Answer any two questions. 12**

- What are the functions of the following 8051 pins?  
ALE EA- PSEN- RST XTAL1 & XTAL2
- Write 8051 program to transfer the message "YES" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.
- What are the modes of operation of Timer in 8051? Write a program Timer 0 to generate a square wave of 20.5 KHz.

**Section – II**

**Q.4 Answer any four questions. 16**

- List out the features of PIC 16F877.
- How internal memory is organized in PIC 16F877?
- Interface one digit seven segment display to 8051 and write a program to display "0" to "9".
- Explain Timer1 operation in PIC 16F877.
- How WDT and BOR internally operate?

**Q.5 Answer any two questions. 12**

- Draw and explain interfacing of ADC 0808/09 to 8051. Write a program to covert analog voltage on channel 1 to digital.
- Draw and explain interfacing of a unipolar stepper motor to 8051 and write a program to rotate the stepper motor in clockwise direction continuously.
- How do you operate CCP module in PWM mode? Explain PWM operation.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 4 of 12

- 9) This program code will be executed continuously:  
STAT: MOV A, #01h  
JNZ A, STAT
  - a) True
  - b) False
- 10) The 8051 has \_\_\_\_\_ 16-bit counter/timers.
  - a) 1
  - b) 2
  - c) 3
  - d) 4
- 11) MOV A, @R1 will: \_\_\_\_\_.
  - a) copy R1 to the accumulator
  - b) copy the accumulator to R1
  - c) copy the contents of memory whose address is in R1 to the accumulator
  - d) copy the accumulator to the contents of memory whose address is in R1
- 12) When the 8051 is reset and the  $\overline{EA}$  line is HIGH, the program counter points to the first program instruction in the: \_\_\_\_\_.
  - a) Internal code memory
  - b) External code memory
  - c) Internal data memory
  - d) External data memory
- 13) The I/O ports that are used as address and data for external memory are: \_\_\_\_\_.
  - a) ports 1 and 2
  - b) ports 1 and 3
  - c) ports 0 and 2
  - d) ports 0 and 3
- 14) LCALL instruction of 8051 is \_\_\_\_\_ byte instruction.
  - a) one
  - b) two
  - c) three
  - d) four

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any four questions. 16**

- a) List the three buses found in computer systems and state briefly the purpose of each bus.
- b) What is the purpose of program counter, stack pointer and instruction decoder?
- c) What are the CPU different registers and their purpose in 8051 microcontroller?
- d) Define addressing mode. Explain the different addressing modes in 8051 with suitable example.
- e) Draw and explain the bit formats of TMOD and TCON registers.

**Q.3 Answer any two questions. 12**

- a) What are the functions of the following 8051 pins?  
ALE EA- PSEN- RST XTAL1 & XTAL2
- b) Write 8051 program to transfer the message "YES" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.
- c) What are the modes of operation of Timer in 8051? Write a program Timer 0 to generate a square wave of 20.5 KHz.

**Section – II**

**Q.4 Answer any four questions. 16**

- a) List out the features of PIC 16F877.
- b) How internal memory is organized in PIC 16F877?
- c) Interface one digit seven segment display to 8051 and write a program to display "0" to "9".
- d) Explain Timer1 operation in PIC 16F877.
- e) How WDT and BOR internally operate?

**Q.5 Answer any two questions. 12**

- a) Draw and explain interfacing of ADC 0808/09 to 8051. Write a program to covert analog voltage on channel 1 to digital.
- b) Draw and explain interfacing of a unipolar stepper motor to 8051 and write a program to rotate the stepper motor in clockwise direction continuously.
- c) How do you operate CCP module in PWM mode? Explain PWM operation.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 7 of 12

- 9) When the 8051 is reset and the  $\overline{EA}$  line is HIGH, the program counter points to the first program instruction in the: \_\_\_\_\_.  
a) Internal code memory                      b) External code memory  
c) Internal data memory                      d) External data memory
- 10) The I/O ports that are used as address and data for external memory are: \_\_\_\_\_.  
a) ports 1 and 2                                  b) ports 1 and 3  
c) ports 0 and 2                                  d) ports 0 and 3
- 11) LCALL instruction of 8051 is \_\_\_\_\_ byte instruction.  
a) one    b) two  
c) three    d) four
- 12) In 8051 \_\_\_\_\_ bit of \_\_\_\_\_ register can be used to double the baud rate.  
a) SM0, SCON                                      b) SMOD, PCON  
c) Gate, TMOD                                      d) SM0, PCON
- 13) Operating CCP1 module in PWM mode, PWM period can be set by writing to \_\_\_\_\_ register.  
a) PR1    b) TMR2  
c) PR2    d) CCP1RL
- 14) In PIC to make Port B an input port, we must place \_\_\_\_\_ in register \_\_\_\_\_.  
a) 00 h, PORTB                                      b) FF h, PORTB  
c) 00 h, TRISB                                      d) FF h, TRISB

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any four questions. 16**

- a) List the three buses found in computer systems and state briefly the purpose of each bus.
- b) What is the purpose of program counter, stack pointer and instruction decoder?
- c) What are the CPU different registers and their purpose in 8051 microcontroller?
- d) Define addressing mode. Explain the different addressing modes in 8051 with suitable example.
- e) Draw and explain the bit formats of TMOD and TCON registers.

**Q.3 Answer any two questions. 12**

- a) What are the functions of the following 8051 pins?  
ALE EA- PSEN- RST XTAL1 & XTAL2
- b) Write 8051 program to transfer the message "YES" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.
- c) What are the modes of operation of Timer in 8051? Write a program Timer 0 to generate a square wave of 20.5 KHz.

**Section – II**

**Q.4 Answer any four questions. 16**

- a) List out the features of PIC 16F877.
- b) How internal memory is organized in PIC 16F877?
- c) Interface one digit seven segment display to 8051 and write a program to display "0" to "9".
- d) Explain Timer1 operation in PIC 16F877.
- e) How WDT and BOR internally operate?

**Q.5 Answer any two questions. 12**

- a) Draw and explain interfacing of ADC 0808/09 to 8051. Write a program to covert analog voltage on channel 1 to digital.
- b) Draw and explain interfacing of a unipolar stepper motor to 8051 and write a program to rotate the stepper motor in clockwise direction continuously.
- c) How do you operate CCP module in PWM mode? Explain PWM operation.



**Seat  
No.**

Max. Marks: 70

Marks: 14

14

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<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any four questions. 16**

- a) List the three buses found in computer systems and state briefly the purpose of each bus.
- b) What is the purpose of program counter, stack pointer and instruction decoder?
- c) What are the CPU different registers and their purpose in 8051 microcontroller?
- d) Define addressing mode. Explain the different addressing modes in 8051 with suitable example.
- e) Draw and explain the bit formats of TMOD and TCON registers.

**Q.3 Answer any two questions. 12**

- a) What are the functions of the following 8051 pins?  
ALE EA- PSEN- RST XTAL1 & XTAL2
- b) Write 8051 program to transfer the message "YES" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.
- c) What are the modes of operation of Timer in 8051? Write a program Timer 0 to generate a square wave of 20.5 KHz.

**Section – II**

**Q.4 Answer any four questions. 16**

- a) List out the features of PIC 16F877.
- b) How internal memory is organized in PIC 16F877?
- c) Interface one digit seven segment display to 8051 and write a program to display "0" to "9".
- d) Explain Timer1 operation in PIC 16F877.
- e) How WDT and BOR internally operate?

**Q.5 Answer any two questions. 12**

- a) Draw and explain interfacing of ADC 0808/09 to 8051. Write a program to covert analog voltage on channel 1 to digital.
- b) Draw and explain interfacing of a unipolar stepper motor to 8051 and write a program to rotate the stepper motor in clockwise direction continuously.
- c) How do you operate CCP module in PWM mode? Explain PWM operation.

<b>Seat No.</b>	
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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data if necessary.

Marks: 14

14

- Page 1 of 12

- 9) A typical organization is devoted to the principle of \_\_\_\_\_.  
a) bureaucracy                      b) efficiency  
c) information                        d) knowledge
- 10) A typical business undergoes which of below pressure \_\_\_\_\_.  
a) legal                                  b) political  
c) technological                        d) all of these
- 11) Key member leaving project team is an example of \_\_\_\_\_.  
a) internal risk                         b) forecast  
c) Issue                                  d) all of these
- 12) A working model that is functionally equivalent to a component of the product is called \_\_\_\_\_.  
a) spiral model                         b) v model  
c) waterfall model                       d) none of these
- 13) Two types of database query are \_\_\_\_\_ and \_\_\_\_\_.  
a) select, update                        b) action, select  
c) action, update                        d) action, retrieval
- 14) Which of below is a sources of data into an enterprise?  
a) Clicksteram at web site              b) CRM input  
c) supply chain input                    d) all of these

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two.** **12**

- a) Classify information systems based on its levels.
- b) With suitable diagram explain flow of e payment with credit/debit card.
- c) With suitable example evaluate need, challenges and benefits of ECM.

**Q.3 Solve Any Four.** **16**

- a) Compare OLAP and data mining.
- b) What are the different models of web mining?
- c) With suitable example explain data, database, information and knowledge.
- d) Describe any four models of e business.
- e) With suitable example compare forward and reverse auctions.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) With suitable example describe any six attributes of the software project.
- b) With suitable example explain how ERP interfaces with other enterprise systems.
- c) With suitable diagram and example explain various flows and processes in supply chain management.

**Q.5 Solve Any Four.** **16**

- a) With suitable example discuss any two ethical issues related to information systems.
- b) With suitable example explain - copyright and patent.
- c) Justify with example - a software project requires a good project management.
- d) Evaluate importance and different types of milestones.
- e) Justify - information systems and organization influence each other.

**Seat  
No.**

**Set Q**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data if necessary.

Marks: 14

## 14

- 1) Take an odd man out- NEFT, IRCTC, RTGS, PayTM, \_\_\_\_\_.  
a) NEFT                                      b) IRCTC  
c) RTGS                                      d) PayTM
- 2) A typical organization is devoted to the principle of \_\_\_\_\_.  
a) bureaucracy                              b) efficiency  
c) information                              d) knowledge
- 3) A typical business undergoes which of below pressure \_\_\_\_\_.  
a) legal                                      b) political  
c) technological                              d) all of these
- 4) Key member leaving project team is an example of \_\_\_\_\_.  
a) internal risk                              b) forecast  
c) Issue                                      d) all of these
- 5) A working model that is functionally equivalent to a component of the product is called \_\_\_\_\_.  
a) spiral model                              b) v model  
c) waterfall model                              d) none of these
- 6) Two types of database query are \_\_\_\_\_ and \_\_\_\_\_.  
a) select, update                              b) action, select  
c) action, update                              d) action, retrieval
- 7) Which of below is a sources of data into an enterprise?  
a) Clicksteram at web site                              b) CRM input  
c) supply chain input                              d) all of these
- 8) Take odd man out- MS Project, MS Access, DB2, Oracle \_\_\_\_\_.  
a) MS Project                              b) MS Access  
c) DB2                                      d) Oracle

- 9) Collection of computing systems used by organization in information system is referred as- \_\_\_\_\_.  
a) e infrastructure                      b) information technology  
c) Processes                              d) all of these
- 10) Which of below is not a major economical impact of information system on organization \_\_\_\_\_.  
a) shrink in organization size              b) change in workplace  
c) reduction in transaction cost          d) outsourcing of services
- 11) Which of below is a legal issue with e commerce \_\_\_\_\_.  
a) admissible evidence                      b) digital signature  
c) Jurisdiction                              d) all of these
- 12) Software is a \_\_\_\_\_ product.  
a) Complex                                  b) intangible  
c) non conform                              d) all of these
- 13) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.  
a) Information technology                  b) Cloud computing  
c) Web services                              d) Apps
- 14) A business analyst is an example of \_\_\_\_\_.  
a) data worker                                  b) information worker  
c) knowledge worker                          d) manager



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<b>Set</b>	<b>Q</b>
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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two.** **12**

- a) Classify information systems based on its levels.
- b) With suitable diagram explain flow of e payment with credit/debit card.
- c) With suitable example evaluate need, challenges and benefits of ECM.

**Q.3 Solve Any Four.** **16**

- a) Compare OLAP and data mining.
- b) What are the different models of web mining?
- c) With suitable example explain data, database, information and knowledge.
- d) Describe any four models of e business.
- e) With suitable example compare forward and reverse auctions.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) With suitable example describe any six attributes of the software project.
- b) With suitable example explain how ERP interfaces with other enterprise systems.
- c) With suitable diagram and example explain various flows and processes in supply chain management.

**Q.5 Solve Any Four.** **16**

- a) With suitable example discuss any two ethical issues related to information systems.
- b) With suitable example explain - copyright and patent.
- c) Justify with example - a software project requires a good project management.
- d) Evaluate importance and different types of milestones.
- e) Justify - information systems and organization influence each other.

<b>Seat No.</b>	
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- 9) Software is a \_\_\_\_\_ product.
- |                |                 |
|----------------|-----------------|
| a) Complex     | b) intangible   |
| c) non conform | d) all of these |
- 10) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.
- |                           |                    |
|---------------------------|--------------------|
| a) Information technology | b) Cloud computing |
| c) Web services           | d) Apps            |
- 11) A business analyst is an example of \_\_\_\_\_.
- |                     |                       |
|---------------------|-----------------------|
| a) data worker      | b) information worker |
| c) knowledge worker | d) manager            |
- 12) Take an odd man out- NEFT, IRCTC, RTGS, PayTM, \_\_\_\_\_.
- |         |          |
|---------|----------|
| a) NEFT | b) IRCTC |
| c) RTGS | d) PayTM |
- 13) A typical organization is devoted to the principle of \_\_\_\_\_.
- |                |               |
|----------------|---------------|
| a) bureaucracy | b) efficiency |
| c) information | d) knowledge  |
- 14) A typical business undergoes which of below pressure \_\_\_\_\_.
- |                  |                 |
|------------------|-----------------|
| a) legal         | b) political    |
| c) technological | d) all of these |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two.** **12**

- a) Classify information systems based on its levels.
- b) With suitable diagram explain flow of e payment with credit/debit card.
- c) With suitable example evaluate need, challenges and benefits of ECM.

**Q.3 Solve Any Four.** **16**

- a) Compare OLAP and data mining.
- b) What are the different models of web mining?
- c) With suitable example explain data, database, information and knowledge.
- d) Describe any four models of e business.
- e) With suitable example compare forward and reverse auctions.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) With suitable example describe any six attributes of the software project.
- b) With suitable example explain how ERP interfaces with other enterprise systems.
- c) With suitable diagram and example explain various flows and processes in supply chain management.

**Q.5 Solve Any Four.** **16**

- a) With suitable example discuss any two ethical issues related to information systems.
- b) With suitable example explain - copyright and patent.
- c) Justify with example - a software project requires a good project management.
- d) Evaluate importance and different types of milestones.
- e) Justify - information systems and organization influence each other.

Seat No.	
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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.
 

a) Information technology	b) Cloud computing
c) Web services	d) Apps
- 2) A business analyst is an example of \_\_\_\_\_.
 

a) data worker	b) information worker
c) knowledge worker	d) manager
- 3) Take an odd man out- NEFT, IRCTC, RTGS, PayTM, \_\_\_\_\_.
 

a) NEFT	b) IRCTC
c) RTGS	d) PayTM
- 4) A typical organization is devoted to the principle of \_\_\_\_\_.
 

a) bureaucracy	b) efficiency
c) information	d) knowledge
- 5) A typical business undergoes which of below pressure \_\_\_\_\_.
 

a) legal	b) political
c) technological	d) all of these
- 6) Key member leaving project team is an example of \_\_\_\_\_.
 

a) internal risk	b) forecast
c) Issue	d) all of these
- 7) A working model that is functionally equivalent to a component of the product is called \_\_\_\_\_.
 

a) spiral model	b) v model
c) waterfall model	d) none of these
- 8) Two types of database query are \_\_\_\_\_ and \_\_\_\_\_.
 

a) select, update	b) action, select
c) action, update	d) action, retrieval

- 9) Which of below is a sources of data into an enterprise?  
a) Clicksteram at web site                      b) CRM input  
c) supply chain input                              d) all of these
- 10) Take odd man out- MS Project, MS Access, DB2, Oracle \_\_\_\_\_.  
a) MS Project    b) MS Access  
c) DB2    d) Oracle
- 11) Collection of computing systems used by organization in information system is referred as- \_\_\_\_\_.  
a) e infrastructure                                      b) information technology  
c) Processes    d) all of these
- 12) Which of below is not a major economical impact of information system on organization \_\_\_\_\_.  
a) shrink in organization size                      b) change in workplace  
c) reduction in transaction cost                      d) outsourcing of services
- 13) Which of below is a legal issue with e commerce \_\_\_\_\_.  
a) admissible evidence                                      b) digital signature  
c) Jurisdiction    d) all of these
- 14) Software is a \_\_\_\_\_ product.  
a) Complex    b) intangible  
c) non conform    d) all of these

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve Any Two.** **12**
- a) Classify information systems based on its levels.
  - b) With suitable diagram explain flow of e payment with credit/debit card.
  - c) With suitable example evaluate need, challenges and benefits of ECM.

- Q.3 Solve Any Four.** **16**
- a) Compare OLAP and data mining.
  - b) What are the different models of web mining?
  - c) With suitable example explain data, database, information and knowledge.
  - d) Describe any four models of e business.
  - e) With suitable example compare forward and reverse auctions.

**Section – II**

- Q.4 Solve Any Two** **12**
- a) With suitable example describe any six attributes of the software project.
  - b) With suitable example explain how ERP interfaces with other enterprise systems.
  - c) With suitable diagram and example explain various flows and processes in supply chain management.

- Q.5 Solve Any Four.** **16**
- a) With suitable example discuss any two ethical issues related to information systems.
  - b) With suitable example explain - copyright and patent.
  - c) Justify with example - a software project requires a good project management.
  - d) Evaluate importance and different types of milestones.
  - e) Justify - information systems and organization influence each other.

<b>Seat No.</b>	
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**Set****P**

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In the Production of Wheat, all of the following are variable factors that are used by the farmer except:
  - a) The seed and fertilizer used when the crop is planted
  - b) The field that has been cleared of trees and in which the crop is planned
  - c) The tractor used by the farmer in planting and cultivating not only wheat but also corn and barley
  - d) The Number of Hours that the farmer spends in cultivating the wheat fields
- 2) Identify the Correct statement:
  - a) The Average Product is at its maximum when marginal product is equal to Average Product
  - b) The Law of Increasing returns to scale relates to the effect of changes in factor Proportions
  - c) Economies of scale arise only because of indivisibilities of factor proportions
  - d) Internal economies of scale can accrue when industry expands beyond optimum
- 3) Which of the following is not a characteristic of land?
  - a) Its supply for the economy is limited
  - b) It's a immobile
  - c) Its usefulness depends on human efforts
  - d) It is produced by our forefathers
- 4) Which of the following statement is true?
  - a) Accumulation of capital depends solely on income of individuals
  - b) Saving can be influenced by government policies
  - c) External economies go with size and internal economies with location
  - d) The Supply curve of labour is an upward slopping curve



- 5) Diminishing Marginal Returns Implies
- a) Decreasing Average variable Costs
  - b) Decreasing Marginal Costs
  - c) Increasing Marginal Costs
  - d) Decreasing Average fixed costs
- 6) In Economics we use the term scarcity to mean
- a) Abstract scarcity and lack of resource in less developed countries
  - b) Relative scarcity i.e. scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
  - d) Scarcity caused on account of excessive consumption by the rich
- 7) The Marginal, Average and Total Product Curves encountered by the firm production in the short run exhibit all of the following relationship except:
- a) When total product rising, average and marginal product may be either rising or falling
  - b) When marginal product is negative, total product and average product are falling
  - c) When average product is at a maximum, marginal product equals average product, and total product is rising
  - d) When marginal product is at a maximum, average product equals marginal product, and total product is rising
- 8) What implication (s) does resource scarcity have for the satisfaction of wants?
- a) Not all wants can be satisfied
  - b) We will never be faced with the need to make a choice
  - c) We must develop ways to decrease our individual wants
  - d) The discovery of new natural resource is necessary to increase our ability to satisfy wants
- 9) Which of the following is a normative statement
- a) Planned economies allocate resources via government department
  - b) Most transitional economies have experienced problems of falling output and rising prices over the past decade
  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
  - d) Reducing inequality should be a major priority for mixed economies
- 10) Demand for a commodity refers to:
- a) Desire backed by ability to pay for the commodity
  - b) Need for the commodity and willingness to pay for it
  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time
- 11) Contraction of demand is a result of:
- a) Decrease in the number of consumers
  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers

- 12)** All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
- a) The preference of the individual
  - b) His monetary income
  - c) Price of the commodity
  - d) Price of related goods
- 13)** A Study of how increase in the corporate income tax rate will affect the national unemployment rate is an example of
- a) Macro-Economics
  - b) Descriptive Economics
  - c) Micro-Economics
  - d) Normative Economics
- 14)** Identify the Factor which Generally keeps the Price-Elasticity of demand for a Good low
- a) Variety of uses for that good
  - b) Very low Price of a Commodity
  - c) Close Substitute for that Good
  - d) High Proportion of the Consumer's Income spent on it

Seat No.	
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Set

P

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four questions.**

16

- What are the Basic Functions of Business Managers? How does Economics helps Business managers in Performing their Functions?
- What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
- Define Budget Line. How is basis of deriving the Budget Line? What purpose does budget line serves in consumer Analysis?
- What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions?
- Explain the concepts separately
  - Income Elasticity of demand
  - Price elasticity of demand
  - Elasticity of Price expectations
- What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and Illustrate Graphically.

**Q.3 Solve any two questions.**

12

- What are major Macro-economics Issues Related Directly to business decision making? What is their Significance in Business Decisions?
- What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?
- Explain the Regression method for estimating a linear function, and estimating the error term.

**Section – II**

**Q.4 Solve any Four questions.**

16

- What is Purpose of demand for casting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- What are the opinion Poll method and Delphi Method?
- What are the methods used for Forecasting demand? Discuss in detail the survey method of Forecasting demand for consumer goods. What are the advantages and Limitations?
- State and Illustrate Cobb-Douglas Production Function. What are Properties of Cobb-Douglas Production Function.
- What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- What is meant by Production? Distinguish between Fixed and Variable Inputs.

**Q.5 Solve any three questions.**

- a) What is the meaning of demand in economics? How is demand different from desire, want and need?
- b) Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c) Plot the following data on a graph and Find the trend equation for sales.

Year	1970	1971	1972	1973	1974	1975	1976
Total Sales (units)	1150	1020	3050	3000	2950	3060	4030

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Set Q
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What implication (s) dose resource scarcity have for the satisfaction of wants?
  - a) Not all wants can be satisfied
  - b) We Will never be faced with the need to make a choices
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  - a) Planned economies allocate resources via government department
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  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
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- 3) Demand for a commodity refers to:
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  - d) The quantity of the commodity demanded at a certain price during any particular period of time
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  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers

- 5) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
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  - d) Price of related goods
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  - c) Micro-Economics
  - d) Normative Economics
- 7) Identify the Factor which Generally keeps the Price-Elasticity of demand for a Good low
- a) Variety of uses for that good
  - b) Very low Price of a Commodity
  - c) Close Substitute for that Good
  - d) High Proportion of the Consumer's Income spent on it
- 8) In the Production of Wheat, all of the following are variable factors that are used by the farmer except:
- a) The seed and fertilizer used when the crop is planted
  - b) The field that has been cleared of trees and in which the crop is planned
  - c) The tractor used by the farmer in planting and cultivating not only wheat but also corn and barley
  - d) The Number of Hours that the farmer spends in cultivating the wheat fields
- 9) Identify the Correct statement:
- a) The Average Product is at its maximum when marginal product is equal to Average Product
  - b) The Law of Increasing returns to scale relates to the effect of changes in factor Proportions
  - c) Economies of scale arise only because of indivisibilities of factor proportions
  - d) Internal economies of scale can accrue when industry expands beyond optimum
- 10) Which of the following is not a characteristic of land?
- a) Its supply for the economy is limited
  - b) It's a immobile
  - c) Its usefulness depends on human efforts
  - d) It is produced by our forefathers
- 11) Which of the following statement is true?
- a) Accumulation of capital depends solely on income of individuals
  - b) Saving can be influenced by government policies
  - c) External economies go with size and internal economies with location
  - d) The Supply curve of labour is an upward slopping curve

- 12)** Diminishing Marginal Returns Implies
- a) Decreasing Average variable Costs
  - b) Decreasing Marginal Costs
  - c) Increasing Marginal Costs
  - d) Decreasing Average fixed costs
- 13)** In Economics we use the term scarcity to mean
- a) Abstract scarcity and lack of resource in less developed countries
  - b) Relative scarcity i.e. scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
  - d) Scarcity caused on account of excessive consumption by the rich
- 14)** The Marginal, Average and Total Product Curves encountered by the firm production in the short run exhibit all of the following relationship except:
- a) When total product rising, average and marginal product may be either rising or falling
  - b) When marginal product is negative, total product and average product are falling
  - c) When average product is at a maximum, marginal product equals average product, and total product is rising
  - d) When marginal product is at a maximum, average product equals marginal product, and total product is rising

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four questions.**

16

- What are the Basic Functions of Business Managers? How does Economics helps Business managers in Performing their Functions?
- What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
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  - Income Elasticity of demand
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- What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and Illustrate Graphically.

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12

- What are major Macro-economics Issues Related Directly to business decision making? What is their Significance in Business Decisions?
- What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?
- Explain the Regression method for estimating a linear function, and estimating the error term.

**Section – II**

**Q.4 Solve any Four questions.**

16

- What is Purpose of demand for casting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
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- What are the methods used for Forecasting demand? Discuss in detail the survey method of Forecasting demand for consumer goods. What are the advantages and Limitations?
- State and Illustrate Cobb-Douglas Production Function. What are Properties of Cobb-Douglas Production Function.
- What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- What is meant by Production? Distinguish between Fixed and Variable Inputs.



**Q.5 Solve any three questions.**

- a) What is the meaning of demand in economics? How is demand different from desire, want and need?
- b) Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c) Plot the following data on a graph and Find the trend equation for sales.

Year	1970	1971	1972	1973	1974	1975	1976
Total Sales (units)	1150	1020	3050	3000	2950	3060	4030

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Contraction of demand is result of:
  - a) Decrease in the number of Consumers
  - b) Increase in the price of the good concerned
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  - d) Decrease in the income of purchasers
- 2) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
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- 4) Identify the Factor which Generally keeps the Price-Elasticity of demand for a Good low
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- 5) In the Production of Wheat, all of the following are variable factors that are used by the farmer except:
  - a) The seed and fertilizer used when the crop is planted
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  - d) The Number of Hours that the farmer spends in cultivating the wheat fields

- 6) Identify the Correct statement:
- a) The Average Product is at its maximum when marginal product is equal to Average Product
  - b) The Law of Increasing returns to scale relates to the effect of changes in factor Proportions
  - c) Economies of scale arise only because of indivisibilities of factor proportions
  - d) Internal economies of scale can accrue when industry expands beyond optimum
- 7) Which of the following is not a characteristic of land?
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  - c) Its usefulness depends on human efforts
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- 8) Which of the following statement is true?
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- 9) Diminishing Marginal Returns Implies
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- 10) In Economics we use the term scarcity to mean
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- 11) The Marginal, Average and Total Product Curves encountered by the firm production in the short run exhibit all of the following relationship except:
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  - b) We Will never be faced with the need to make a choices
  - c) We must develop ways to decrease our individual wants
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- 13)** Which of the following is a normative statement
- a) Planned economies allocate resources via government department
  - b) Most transitional economies have experienced problems of falling output and rising prices over past decade
  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
  - d) Reducing inequality should be major priority for mixed economies
- 14)** Demand for a commodity refers to:
- a) Desire backed by ability to pay for the commodity
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  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Solve any four questions.** **16**

- a) What are the Basic Functions of Business Managers? How does Economics helps Business managers in Performing their Functions?
- b) What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
- c) Define Budget Line. How is basis of deriving the Budget Line? What purpose does budget line serves in consumer Analysis?
- d) What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions?
- e) Explain the concepts separately
  - 1) Income Elasticity of demand
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- f) What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and Illustrate Graphically.

**Q.3 Solve any two questions.** **12**

- a) What are major Macro-economics Issues Related Directly to business decision making? What is their Significance in Business Decisions?
- b) What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?
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**Section – II**

**Q.4 Solve any Four questions.** **16**

- a) What is Purpose of demand for casting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
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- c) What are the methods used for Forecasting demand? Discuss in detail the survey method of Forecasting demand for consumer goods. What are the advantages and Limitations?
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Tuesday, 07-02-2023

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In Economics we use the term scarcity to mean
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Solve any four questions.** **16**

- a) What are the Basic Functions of Business Managers? How does Economics helps Business managers in Performing their Functions?
- b) What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
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  - 1) Income Elasticity of demand
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  - 3) Elasticity of Price expectations
- f) What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and Illustrate Graphically.

**Q.3 Solve any two questions.** **12**

- a) What are major Macro-economics Issues Related Directly to business decision making? What is their Significance in Business Decisions?
- b) What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?
- c) Explain the Regression method for estimating a linear function, and estimating the error term.

**Section – II**

**Q.4 Solve any Four questions.** **16**

- a) What is Purpose of demand for casting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- b) What are the opinion Poll method and Delphi Method?
- c) What are the methods used for Forecasting demand? Discuss in detail the survey method of Forecasting demand for consumer goods. What are the advantages and Limitations?
- d) State and Illustrate Cobb-Douglas Production Function. What are Properties of Cobb-Douglas Production Function.
- e) What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- f) What is meant by Production? Distinguish between Fixed and Variable Inputs.

**Q.5 Solve any three questions.**

- a) What is the meaning of demand in economics? How is demand different from desire, want and need?
- b) Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c) Plot the following data on a graph and Find the trend equation for sales.

Year	1970	1971	1972	1973	1974	1975	1976
Total Sales (units)	1150	1020	3050	3000	2950	3060	4030



- 8) \_\_\_\_\_ the application of rules and procedures to people in a consistent and avoiding arbitrarily decision-making and without discrimination on bases other than merit.
- a) Discrimination
  - b) Employees Privacy
  - c) Right and Duties
  - d) Due Process and Lay off
- 9) The claim that employees should also have a certain degree influence on their tasks, their job environmental and their company goals that is a \_\_\_\_\_.
- a) Discrimination
  - b) Employee Privacy
  - c) Right to participation
  - d) Due Process and Lay off
- 10) CSO stands for what?
- a) Civil Society Organization
  - b) Consumer Society Organization
  - c) Central Statistics Office
  - d) None of these
- 11) \_\_\_\_\_ seek to punish the target company for its actions. Therefore, rather than communicating displeasure, the boycotters actively seek to cause the firm harm, usually by aiming for significant erosion of sales.
- a) Instrumental Boycotts
  - b) Catalytic Boycott
  - c) Expressive Boycott
  - d) Punitive Boycott
- 12) Customer is stakeholder of organization.
- a) True
  - b) False
- 13) \_\_\_\_\_ is the long- term maintenance of the system according to environmental and economical and Social consideration.
- a) Security
  - b) Sustainability
  - c) Business Ethics
  - d) None of above
- 14) Characteristics of Civil Society are \_\_\_\_\_.
- a) Social change
  - b) Social accountability
  - c) Community empowerment
  - d) All of above

<b>Seat No.</b>	
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**Set****P**

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain Sustainability - a key Context for Business Ethics.
- b) Write a short note on: Importance of Business Ethics.
- c) Illustrate the methods of assessing ethical performance.
- d) What are key features of Corporate?
- e) What are main contents of code of ethics?

**Q.3 Solve any two of the following.** **12**

- a) Explain the components of business ethics management.
- b) What is stakeholder theory of firm?
- c) Explain in detail Normative Ethical Theories.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Explain the ethical issues in firm-employee relationship.
- b) Explain the functions of CSO.
- c) Write a short note on marketing & consumer.
- d) List & explain the ethical issues in CSO.
- e) Write a short note on globalization-business government relation.

**Q.5 Solve any two of the following.** **12**

- a) Explain the concept of Data identity and security.
- b) Explain the Ethics of pollution control.
- c) What are Ethical challenges of globalization?

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ the application of rules and procedures to people in a consistent and avoiding arbitrarily decision-making and without discrimination on bases other than merit.
 

a) Discrimination	b) Employees Privacy
c) Right and Duties	d) Due Process and Lay off
- 2) The claim that employees should also have a certain degree influence on their tasks, their job environmental and their company goals that is a \_\_\_\_\_.
 

a) Discrimination	b) Employee Privacy
c) Right to participation	d) Due Process and Lay off
- 3) CSO stands for what?
 

a) Civil Society Organization	b) Consumer Society Organization
c) Central Statistics Office	d) None of these
- 4) \_\_\_\_\_ seek to punish the target company for its actions. Therefore, rather than communicating displeasure, the boycotters actively seek to cause the firm harm, usually by aiming for significant erosion of sales.
 

a) Instrumental Boycotts	b) Catalytic Boycott
c) Expressive Boycott	d) Punitive Boycott
- 5) Customer is stakeholder of organization.
 

a) True	b) False
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- 6) \_\_\_\_\_ is the long- term maintenance of the system according to environmental and economical and Social consideration.
 

a) Security	b) Sustainability
c) Business Ethics	d) None of above
- 7) Characteristics of Civil Society are \_\_\_\_\_.
 

a) Social change	b) Social accountability
c) Community empowerment	d) All of above

- 8) \_\_\_\_\_ is the progressive eroding of the relevance of territorial bases for social, economical and political activities process and relations.
- a) Globalization
  - b) Privatization
  - c) Liberalization
  - d) None of these
- 9) \_\_\_\_\_ is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- a) Accountability
  - b) Sustainability
  - c) Globalization
  - d) All of these
- 10) \_\_\_\_\_ are moral philosophy or ethics concerned with criteria of what is morally right and wrong.
- a) Normative Ethical Theories
  - b) Descriptive Ethics Theories
  - c) Traditional Ethics Theories
  - d) All of these
- 11) Model of ethical decision-making seek to represent things \_\_\_\_\_.
- a) The different stages in decision-making
  - b) The different influences on that process
  - c) Both a and b
  - d) None of these
- 12) Which is a stage of Ethical Decision Making?
- a) Make Moral Judgement
  - b) Individual Factors
  - c) Situational Factors
  - d) All of these
- 13) What is Full Form Of CSR?
- a) Corporate Social Reporting
  - b) Corporate Social Research
  - c) Corporate Social Responsibility
  - d) None of these
- 14) Which responsibility makes corporations to do what is right and fair even when they are not compelled to do so by the legal framework?
- a) Ethical Responsibility
  - b) Legal Responsibility
  - c) Philanthropic Responsibility
  - d) Economic Responsibility



<b>Seat No.</b>	
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**Set Q**

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following. 16**

- a) Explain Sustainability - a key Context for Business Ethics.
- b) Write a short note on: Importance of Business Ethics.
- c) Illustrate the methods of assessing ethical performance.
- d) What are key features of Corporate?
- e) What are main contents of code of ethics?

**Q.3 Solve any two of the following. 12**

- a) Explain the components of business ethics management.
- b) What is stakeholder theory of firm?
- c) Explain in detail Normative Ethical Theories.

**Section – II**

**Q.4 Solve any four of the following. 16**

- a) Explain the ethical issues in firm-employee relationship.
- b) Explain the functions of CSO.
- c) Write a short note on marketing & consumer.
- d) List & explain the ethical issues in CSO.
- e) Write a short note on globalization-business government relation.

**Q.5 Solve any two of the following. 12**

- a) Explain the concept of Data identity and security.
- b) Explain the Ethics of pollution control.
- c) What are Ethical challenges of globalization?

Seat No.	
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Set R
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) \_\_\_\_\_ seek to punish the target company for its actions. Therefore, rather than communicating displeasure, the boycotters actively seek to cause the firm harm, usually by aiming for significant erosion of sales.  
 a) Instrumental Boycotts                      b) Catalytic Boycott  
 c) Expressive Boycott                        d) Punitive Boycott
- 2) Customer is stakeholder of organization.  
 a) True    b) False
- 3) \_\_\_\_\_ is the long- term maintenance of the system according to environmental and economical and Social consideration.  
 a) Security                                        b) Sustainability  
 c) Business Ethics                            d) None of above
- 4) Characteristics of Civil Society are \_\_\_\_\_.  
 a) Social change                                b) Social accountability  
 c) Community empowerment              d) All of above
- 5) \_\_\_\_\_ is the progressive eroding of the relevance of territorial bases for social, economical and political activities process and relations.  
 a) Globalization                                b) Privatization  
 c) Liberalization                                d) None of these
- 6) \_\_\_\_\_ is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.  
 a) Accountability                                b) Sustainability  
 c) Globalization                                d) All of these
- 7) \_\_\_\_\_ are moral philosophy or ethics concerned with criteria of what is morally rights and wrong.  
 a) Normative Ethical Theories              b) Descriptive Ethics Theories  
 c) Traditional Ethics Theories              d) All of these
- 8) Model of ethical decision-making seek to represent things \_\_\_\_\_.  
 a) The different stages in decision-making  
 b) The different influences on that process  
 c) Both a and b  
 d) None of these

- 9) Which is a stage of Ethical Decision Making?
- a) Make Moral Judgement
  - b) Individual Factors
  - c) Situational Factors
  - d) All of these
- 10) What is Full Form Of CSR?
- a) Corporate Social Reporting
  - b) Corporate Social Research
  - c) Corporate Social Responsibility
  - d) None of these
- 11) Which responsibility makes corporations to do what is right and fair even when they are not compelled to do so by the legal framework?
- a) Ethical Responsibility
  - b) Legal Responsibility
  - c) Philanthropic Responsibility
  - d) Economic Responsibility
- 12) \_\_\_\_\_ the application of rules and procedures to people in a consistent and avoiding arbitrarily decision-making and without discrimination on bases other than merit.
- a) Discrimination
  - b) Employees Privacy
  - c) Right and Duties
  - d) Due Process and Lay off
- 13) The claim that employees should also have a certain degree influence on their tasks, their job environmental and their company goals that is a \_\_\_\_\_.
- a) Discrimination
  - b) Employee Privacy
  - c) Right to participation
  - d) Due Process and Lay off
- 14) CSO stands for what?
- a) Civil Society Organization
  - b) Consumer Society Organization
  - c) Central Statistics Office
  - d) None of these

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain Sustainability - a key Context for Business Ethics.
- b) Write a short note on: Importance of Business Ethics.
- c) Illustrate the methods of assessing ethical performance.
- d) What are key features of Corporate?
- e) What are main contents of code of ethics?

**Q.3 Solve any two of the following.** **12**

- a) Explain the components of business ethics management.
- b) What is stakeholder theory of firm?
- c) Explain in detail Normative Ethical Theories.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Explain the ethical issues in firm-employee relationship.
- b) Explain the functions of CSO.
- c) Write a short note on marketing & consumer.
- d) List & explain the ethical issues in CSO.
- e) Write a short note on globalization-business government relation.

**Q.5 Solve any two of the following.** **12**

- a) Explain the concept of Data identity and security.
- b) Explain the Ethics of pollution control.
- c) What are Ethical challenges of globalization?

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is Full Form Of CSR?
  - a) Corporate Social Reporting
  - b) Corporate Social Research
  - c) Corporate Social Responsibility
  - d) None of these
- 2) Which responsibility makes corporations to do what is right and fair even when they are not compelled to do so by the legal framework?
  - a) Ethical Responsibility
  - b) Legal Responsibility
  - c) Philanthropic Responsibility
  - d) Economic Responsibility
- 3) \_\_\_\_\_ the application of rules and procedures to people in a consistent and avoiding arbitrarily decision-making and without discrimination on bases other than merit.
  - a) Discrimination
  - b) Employees Privacy
  - c) Right and Duties
  - d) Due Process and Lay off
- 4) The claim that employees should also have a certain degree influence on their tasks, their job environmental and their company goals that is a \_\_\_\_\_.
  - a) Discrimination
  - b) Employee Privacy
  - c) Right to participation
  - d) Due Process and Lay off
- 5) CSO stands for what?
  - a) Civil Society Organization
  - b) Consumer Society Organization
  - c) Central Statistics Office
  - d) None of these
- 6) \_\_\_\_\_ seek to punish the target company for its actions. Therefore, rather than communicating displeasure, the boycotters actively seek to cause the firm harm, usually by aiming for significant erosion of sales.
  - a) Instrumental Boycotts
  - b) Catalytic Boycott
  - c) Expressive Boycott
  - d) Punitive Boycott
- 7) Customer is stakeholder of organization.
  - a) True
  - b) False

- 8) \_\_\_\_\_ is the long- term maintenance of the system according to environmental and economical and Social consideration.
- a) Security
  - b) Sustainability
  - c) Business Ethics
  - d) None of above
- 9) Characteristics of Civil Society are \_\_\_\_\_.
- a) Social change
  - b) Social accountability
  - c) Community empowerment
  - d) All of above
- 10) \_\_\_\_\_ is the progressive eroding of the relevance of territorial bases for social, economical and political activities process and relations.
- a) Globalization
  - b) Privatization
  - c) Liberalization
  - d) None of these
- 11) \_\_\_\_\_ is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- a) Accountability
  - b) Sustainability
  - c) Globalization
  - d) All of these
- 12) \_\_\_\_\_ are moral philosophy or ethics concerned with criteria of what is morally rights and wrong.
- a) Normative Ethical Theories
  - b) Descriptive Ethics Theories
  - c) Traditional Ethics Theories
  - d) All of these
- 13) Model of ethical decision-making seek to represent things \_\_\_\_\_.
- a) The different stages in decision-making
  - b) The different influences on that process
  - c) Both a and b
  - d) None of these
- 14) Which is a stage of Ethical Decision Making?
- a) Make Moral Judgement
  - b) Individual Factors
  - c) Situational Factors
  - d) All of these

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain Sustainability - a key Context for Business Ethics.
- b) Write a short note on: Importance of Business Ethics.
- c) Illustrate the methods of assessing ethical performance.
- d) What are key features of Corporate?
- e) What are main contents of code of ethics?

**Q.3 Solve any two of the following.** **12**

- a) Explain the components of business ethics management.
- b) What is stakeholder theory of firm?
- c) Explain in detail Normative Ethical Theories.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Explain the ethical issues in firm-employee relationship.
- b) Explain the functions of CSO.
- c) Write a short note on marketing & consumer.
- d) List & explain the ethical issues in CSO.
- e) Write a short note on globalization-business government relation.

**Q.5 Solve any two of the following.** **12**

- a) Explain the concept of Data identity and security.
- b) Explain the Ethics of pollution control.
- c) What are Ethical challenges of globalization?

Seat No.	
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Set

P

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If a machine can change its course of action based on the external environment on its own, the machine is called?
  - a) Mobile
  - b) Intelligent
  - c) Both a) and b)
  - d) None of the above
- 2) The "Father of Artificial Intelligence" is \_\_\_\_\_.
  - a) Alan Turing
  - b) Charles Babbage
  - c) John McCarthy
  - d) None of the above
- 3) Which of the following are heuristic search algorithms?
  - a) Best First Search Algorithm
  - b) A\*Search Algorithm
  - c) Both a) and b)
  - d) None of the above
- 4) Which of the following is the common language for Artificial Intelligence?
  - a) Python
  - b) Java
  - c) Lisp
  - d) PHP
- 5) Which of the following is a type of artificial intelligence agent?
  - a) Learning AI Agent
  - b) Simple Reflex AI Agent
  - c) Goal-Based AI Agent
  - d) All of the above
- 6) Which of the following are appropriate levels for a knowledge- based AI agent?
  - a) Knowledge Level
  - b) Logical Level
  - c) Implementation Level
  - d) All of the above
- 7) Decisions of Victory/Defeat are made in Game trees using which algorithm?
  - a) DFS
  - b) BFS
  - c) Heuristic Search
  - d) Min/Max Algorithm
- 8) What are the different types of Artificial Intelligence approaches?
  - a) Strong Approach
  - b) Weak Approach
  - c) Applied Approach
  - d) All of the above



- 9)** How an AI agent does interact with its environment?
- a) Using sensors and perceivers      b) Using only sensors
  - c) Using only perceivers              d) None of the above
- 10)** The correct ways to solve a problem of state-space search are?
- a) Forward from the initial state      b) Backward from the goal
  - c) Both a) and b)                      d) None of the above
- 11)** Out of the given options, which of the following algorithms uses the least memory?
- a) DFS                                      b) BFS
  - c) Both a) and b) are the same      d) Cannot be compared
- 12)** What is the work of Task Environment and Rational Agents?
- a) Problem and Solution              b) Solution and Problem
  - c) Observation and Problem          d) Observation and Solution
- 13)** How is a decision reached upon by a decision tree?
- a) No test                                  b) Single Test
  - c) Double Test                          d) Multiple sequences of tests
- 14)** The different types of machine learning are?
- a) Supervised                              b) Unsupervised
  - c) Reinforcement                        d) All of the above

<b>Seat No.</b>	
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**Set****P**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR questions.** **16**

- a) Explain AO\* Search Algorithm with example.
- b) Define Artificial Intelligence and what are the Applications of AI?
- c) State & explain different types of Agents.
- d) Write short notes.
  - 1) Description logics
  - 2) Situation calculus
- e) Differentiate Informed & Uninformed search.

**Q.3 Solve any TWO questions.** **12**

- a) Explain Heuristic Search Algorithm with example.
- b) What is Knowledge based system? Explain First Order Logic in details.
- c) State Different types of uniformed search algorithm. Explain any one in details along with advantages & disadvantages.

**Section – II**

**Q.4 Solve any FOUR questions.** **16**

- a) Write a note on Bayesian Network.
- b) Explain in detail about conditional Probability.
- c) What is elementary game theory? Explain with example.
- d) What is Utility Theory? How it will become helpful for talking decision?
- e) Describe the issues in knowledge representation.

**Q.5 Solve any TWO questions.** **12**

- a) Explain Decision Tree in details with one example.
- b) Explain Probability and Bayes' theorem along with example.
- c) What is Reinforcement learning? Explain types of Reinforcement learning.

Seat No.	
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Set Q
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What are the different types of Artificial Intelligence approaches?
 

a) Strong Approach	b) Weak Approach
c) Applied Approach	d) All of the above
- 2) How an AI agent does interact with its environment?
 

a) Using sensors and perceivers	b) Using only sensors
c) Using only perceivers	d) None of the above
- 3) The correct ways to solve a problem of state-space search are?
 

a) Forward from the initial state	b) Backward from the goal
c) Both a) and b)	d) None of the above
- 4) Out of the given options, which of the following algorithms uses the least memory?
 

a) DFS	b) BFS
c) Both a) and b) are the same	d) Cannot be compared
- 5) What is the work of Task Environment and Rational Agents?
 

a) Problem and Solution	b) Solution and Problem
c) Observation and Problem	d) Observation and Solution
- 6) How is a decision reached upon by a decision tree?
 

a) No test	b) Single Test
c) Double Test	d) Multiple sequences of tests
- 7) The different types of machine learning are?
 

a) Supervised	b) Unsupervised
c) Reinforcement	d) All of the above
- 8) If a machine can change its course of action based on the external environment on its own, the machine is called?
 

a) Mobile	b) Intelligent
c) Both a) and b)	d) None of the above
- 9) The "Father of Artificial Intelligence" is \_\_\_\_\_.
 

a) Alan Turing	b) Charles Babbage
c) John McCarthy	d) None of the above

- 10)** Which of the following are heuristic search algorithms?
- a) Best First Search Algorithm
  - b) A\*Search Algorithm
  - c) Both a) and b)
  - d) None of the above
- 11)** Which of the following is the common language for Artificial Intelligence?
- a) Python
  - b) Java
  - c) Lisp
  - d) PHP
- 12)** Which of the following is a type of artificial intelligence agent?
- a) Learning AI Agent
  - b) Simple Reflex AI Agent
  - c) Goal-Based AI Agent
  - d) All of the above
- 13)** Which of the following are appropriate levels for a knowledge- based AI agent?
- a) Knowledge Level
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  - c) Implementation Level
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- 14)** Decisions of Victory/Defeat are made in Game trees using which algorithm?
- a) DFS
  - b) BFS
  - c) Heuristic Search
  - d) Min/Max Algorithm

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR questions.** **16**

- a) Explain AO\* Search Algorithm with example.
- b) Define Artificial Intelligence and what are the Applications of AI?
- c) State & explain different types of Agents.
- d) Write short notes.
  - 1) Description logics
  - 2) Situation calculus
- e) Differentiate Informed & Uninformed search.

**Q.3 Solve any TWO questions.** **12**

- a) Explain Heuristic Search Algorithm with example.
- b) What is Knowledge based system? Explain First Order Logic in details.
- c) State Different types of uniformed search algorithm. Explain any one in details along with advantages & disadvantages.

**Section – II**

**Q.4 Solve any FOUR questions.** **16**

- a) Write a note on Bayesian Network.
- b) Explain in detail about conditional Probability.
- c) What is elementary game theory? Explain with example.
- d) What is Utility Theory? How it will become helpful for talking decision?
- e) Describe the issues in knowledge representation.

**Q.5 Solve any TWO questions.** **12**

- a) Explain Decision Tree in details with one example.
- b) Explain Probability and Bayes' theorem along with example.
- c) What is Reinforcement learning? Explain types of Reinforcement learning.

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Out of the given options, which of the following algorithms uses the least memory?
  - a) DFS
  - b) BFS
  - c) Both a) and b) are the same
  - d) Cannot be compared
- 2) What is the work of Task Environment and Rational Agents?
  - a) Problem and Solution
  - b) Solution and Problem
  - c) Observation and Problem
  - d) Observation and Solution
- 3) How is a decision reached upon by a decision tree?
  - a) No test
  - b) Single Test
  - c) Double Test
  - d) Multiple sequences of tests
- 4) The different types of machine learning are?
  - a) Supervised
  - b) Unsupervised
  - c) Reinforcement
  - d) All of the above
- 5) If a machine can change its course of action based on the external environment on its own, the machine is called?
  - a) Mobile
  - b) Intelligent
  - c) Both a) and b)
  - d) None of the above
- 6) The "Father of Artificial Intelligence" is \_\_\_\_\_.
  - a) Alan Turing
  - b) Charles Babbage
  - c) John McCarthy
  - d) None of the above
- 7) Which of the following are heuristic search algorithms?
  - a) Best First Search Algorithm
  - b) A\*Search Algorithm
  - c) Both a) and b)
  - d) None of the above
- 8) Which of the following is the common language for Artificial Intelligence?
  - a) Python
  - b) Java
  - c) Lisp
  - d) PHP
- 9) Which of the following is a type of artificial intelligence agent?
  - a) Learning AI Agent
  - b) Simple Reflex AI Agent
  - c) Goal-Based AI Agent
  - d) All of the above

- 10)** Which of the following are appropriate levels for a knowledge- based AI agent?
- |                         |                     |
|-------------------------|---------------------|
| a) Knowledge Level      | b) Logical Level    |
| c) Implementation Level | d) All of the above |
- 11)** Decisions of Victory/Defeat are made in Game trees using which algorithm?
- |                     |                      |
|---------------------|----------------------|
| a) DFS              | b) BFS               |
| c) Heuristic Search | d) Min/Max Algorithm |
- 12)** What are the different types of Artificial Intelligence approaches?
- |                     |                     |
|---------------------|---------------------|
| a) Strong Approach  | b) Weak Approach    |
| c) Applied Approach | d) All of the above |
- 13)** How an AI agent does interact with its environment?
- |                                 |                       |
|---------------------------------|-----------------------|
| a) Using sensors and perceivers | b) Using only sensors |
| c) Using only perceivers        | d) None of the above  |
- 14)** The correct ways to solve a problem of state-space search are?
- |                                   |                           |
|-----------------------------------|---------------------------|
| a) Forward from the initial state | b) Backward from the goal |
| c) Both a) and b)                 | d) None of the above      |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR questions.** **16**

- a) Explain AO\* Search Algorithm with example.
- b) Define Artificial Intelligence and what are the Applications of AI?
- c) State & explain different types of Agents.
- d) Write short notes.
  - 1) Description logics
  - 2) Situation calculus
- e) Differentiate Informed & Uninformed search.

**Q.3 Solve any TWO questions.** **12**

- a) Explain Heuristic Search Algorithm with example.
- b) What is Knowledge based system? Explain First Order Logic in details.
- c) State Different types of uniformed search algorithm. Explain any one in details along with advantages & disadvantages.

**Section – II**

**Q.4 Solve any FOUR questions.** **16**

- a) Write a note on Bayesian Network.
- b) Explain in detail about conditional Probability.
- c) What is elementary game theory? Explain with example.
- d) What is Utility Theory? How it will become helpful for talking decision?
- e) Describe the issues in knowledge representation.

**Q.5 Solve any TWO questions.** **12**

- a) Explain Decision Tree in details with one example.
- b) Explain Probability and Bayes' theorem along with example.
- c) What is Reinforcement learning? Explain types of Reinforcement learning.



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following are appropriate levels for a knowledge- based AI agent?
 

a) Knowledge Level	b) Logical Level
c) Implementation Level	d) All of the above
- 2) Decisions of Victory/Defeat are made in Game trees using which algorithm?
 

a) DFS	b) BFS
c) Heuristic Search	d) Min/Max Algorithm
- 3) What are the different types of Artificial Intelligence approaches?
 

a) Strong Approach	b) Weak Approach
c) Applied Approach	d) All of the above
- 4) How an AI agent does interact with its environment?
 

a) Using sensors and perceivers	b) Using only sensors
c) Using only perceivers	d) None of the above
- 5) The correct ways to solve a problem of state-space search are?
 

a) Forward from the initial state	b) Backward from the goal
c) Both a) and b)	d) None of the above
- 6) Out of the given options, which of the following algorithms uses the least memory?
 

a) DFS	b) BFS
c) Both a) and b) are the same	d) Cannot be compared
- 7) What is the work of Task Environment and Rational Agents?
 

a) Problem and Solution	b) Solution and Problem
c) Observation and Problem	d) Observation and Solution
- 8) How is a decision reached upon by a decision tree?
 

a) No test	b) Single Test
c) Double Test	d) Multiple sequences of tests



<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR questions. 16**

- a) Explain AO\* Search Algorithm with example.
- b) Define Artificial Intelligence and what are the Applications of AI?
- c) State & explain different types of Agents.
- d) Write short notes.
  - 1) Description logics
  - 2) Situation calculus
- e) Differentiate Informed & Uninformed search.

**Q.3 Solve any TWO questions. 12**

- a) Explain Heuristic Search Algorithm with example.
- b) What is Knowledge based system? Explain First Order Logic in details.
- c) State Different types of uniformed search algorithm. Explain any one in details along with advantages & disadvantages.

**Section – II**

**Q.4 Solve any FOUR questions. 16**

- a) Write a note on Bayesian Network.
- b) Explain in detail about conditional Probability.
- c) What is elementary game theory? Explain with example.
- d) What is Utility Theory? How it will become helpful for talking decision?
- e) Describe the issues in knowledge representation.

**Q.5 Solve any TWO questions. 12**

- a) Explain Decision Tree in details with one example.
- b) Explain Probability and Bayes' theorem along with example.
- c) What is Reinforcement learning? Explain types of Reinforcement learning.

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full.

Duration: 30 Minutes

Marks: 14

14

- Page 1 of 12

- 9) \_\_\_\_\_ techniques can be used to reduce the number of values for a given continuous attribute, by dividing the range of the attribute into intervals.
- a) Discretization
  - b) Transformation
  - c) Smoothing
  - d) Generalization
- 10) Which of the following method is used for finding optimal of cluster in K-Mean algorithm?
- a) Elbow method
  - b) Manhattan method
  - c) C. Ecludian method
  - d) All of the above
- 11) The Noise and outliers, missing values and duplicate data are problems of \_\_\_\_\_.
- a) Processing data
  - b) Mapping Data
  - c) Evaluating data
  - d) Data quality
- 12) ANN stands for \_\_\_\_\_.
- a) Ariel Neural Network
  - b) Artificial Neural Nucleus
  - c) Artificial Neural Network
  - d) Ariel Neural Nucleus
- 13) Create new attributes that can capture the important information in a data set much more efficiently than the original attributes \_\_\_\_\_.
- a) Feature Creation
  - b) Feature Selection
  - c) PCA
  - d) All of the above
- 14) The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of \_\_\_\_\_.
- a) object detection
  - b) object classification
  - c) object clustering
  - d) All of the above

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full.

**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) Explain data scale types with suitable example.
- b) Write short note on “Structured Features”
- c) Explain kind of features in data science.
- d) What is meant by Dimensionality Reduction?
- e) Illustrate singular value decomposition method

**Q.3 Attempt any TWO.** **12**

- a) Explain in detail Principal Component Analysis (PCA).
- b) Explain how to improve the data quality.
- c) What do you mean by incomplete features?

**Section – II**

**Q.4 Attempt any FOUR.** **16**

- a) Explain the process of binarization.
- b) What is the Objective Function of k-Means?
- c) Explain the image gradients.
- d) Explain the convolution layer of Neural Network.
- e) Write variance scaling with examples.

**Q.5 Attempt any TWO.** **12**

- a) Explain in detail k-means clustering.
- b) Explain the manual feature Extraction HOG.
- c) Explain the log and power transform and its generalization in brief.

Seat No.	
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Set Q
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) What is the use of the bin/ binary data structure?
  - a) to have efficient insertion
  - b) to have efficient region query
  - c) to have efficient deletion
  - d) to have efficient traversal
- 2) \_\_\_\_\_ techniques can be used to reduce the number of values for a given continuous attribute, by dividing the range of the attribute into intervals.
  - a) Discretization
  - b) Transformation
  - c) Smoothing
  - d) Generalization
- 3) Which of the following method is used for finding optimal of cluster in K-Mean algorithm?
  - a) Elbow method
  - b) Manhattan method
  - c) C. Ecludian method
  - d) All of the above
- 4) The Noise and outliers, missing values and duplicate data are problems of \_\_\_\_\_.
  - a) Processing data
  - b) Mapping Data
  - c) Evaluating data
  - d) Data quality
- 5) ANN stands for \_\_\_\_\_.
  - a) Ariel Neural Network
  - b) Artificial Neural Nucleus
  - c) Artificial Neural Network
  - d) Ariel Neural Nucleus
- 6) Create new attributes that can capture the important information in a data set much more efficiently than the original attributes \_\_\_\_\_.
  - a) Feature Creation
  - b) Feature Selection
  - c) PCA
  - d) All of the above
- 7) The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of \_\_\_\_\_.
  - a) object detection
  - b) object classification
  - c) object clustering
  - d) All of the above
- 8) Data Analysis is a process of \_\_\_\_\_.
  - a) Inspecting data
  - b) Cleaning data
  - c) Transforming data
  - d) All of the above

- 9) Amongst which of the following step is performed by data scientist after acquiring the data?
- a) Deletion
  - b) Data Replication
  - c) Data Integration
  - d) Data Cleansing
- 10) Amongst which of the following is / are the true about regression analysis?
- a) Describes associations within the data
  - b) Modeling relationships within the data
  - c) Answering yes/no questions about the data
  - d) All of the mentioned above
- 11) By normalizing relations or sets of relations, one minimizes \_\_\_\_\_.
- a) Data
  - b) Fields
  - c) Redundancy
  - d) Database
- 12) A graph that uses vertical bars to represent data is called a \_\_\_\_\_.
- a) Bar graph
  - b) Line graph
  - c) Scatterplot
  - d) All of the mentioned above
- 13) Which of the following techniques would perform better for reducing dimensions of a data set?
- a) Removing columns which have too many missing values
  - b) Removing columns which have high variance in data
  - c) Removing columns with dissimilar data trends
  - d) None of these
- 14) Clustering belongs to \_\_\_\_\_ data analysis.
- a) Supervised
  - b) Unsupervised
  - c) Both a) and b)
  - d) None of the mentioned above



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**

**ELECTRONICS ENGINEERING**

**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full.

**Section – I**

**Q.2 Attempt any FOUR. 16**

- a) Explain data scale types with suitable example.
- b) Write short note on “Structured Features”
- c) Explain kind of features in data science.
- d) What is meant by Dimensionality Reduction?
- e) Illustrate singular value decomposition method

**Q.3 Attempt any TWO. 12**

- a) Explain in detail Principal Component Analysis (PCA).
- b) Explain how to improve the data quality.
- c) What do you mean by incomplete features?

**Section – II**

**Q.4 Attempt any FOUR. 16**

- a) Explain the process of binarization.
- b) What is the Objective Function of k-Means?
- c) Explain the image gradients.
- d) Explain the convolution layer of Neural Network.
- e) Write variance scaling with examples.

**Q.5 Attempt any TWO. 12**

- a) Explain in detail k-means clustering.
- b) Explain the manual feature Extraction HOG.
- c) Explain the log and power transform and its generalization in brief.

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full.

Marks: 14

14

- 1) The Noise and outliers, missing values and duplicate data are problems of \_\_\_\_\_.  
a) Processing data                      b) Mapping Data  
c) Evaluating data                     d) Data quality
- 2) ANN stands for \_\_\_\_\_.  
a) Ariel Neural Network                b) Artificial Neural Nucleus  
c) Artificial Neural Network          d) Ariel Neural Nucleus
- 3) Create new attributes that can capture the important information in a data set much more efficiently than the original attributes \_\_\_\_\_.  
a) Feature Creation                      b) Feature Selection  
c) PCA                                        d) All of the above
- 4) The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of \_\_\_\_\_.  
a) object detection                        b) object classification  
c) object clustering                        d) All of the above
- 5) Data Analysis is a process of \_\_\_\_\_.  
a) Inspecting data                         b) Cleaning data  
c) Transforming data                      d) All of the above
- 6) Amongst which of the following step is performed by data scientist after acquiring the data?  
a) Deletion                                  b) Data Replication  
c) Data Integration                        d) Data Cleansing
- 7) Amongst which of the following is / are the true about regression analysis?  
a) Describes associations within the data  
b) Modeling relationships within the data  
c) Answering yes/no questions about the data  
d) All of the mentioned above
- 8) By normalizing relations or sets of relations, one minimizes \_\_\_\_\_.  
a) Data                                        b) Fields  
c) Redundancy                              d) Database

- 9) A graph that uses vertical bars to represent data is called a \_\_\_\_\_.  
a) Bar graph                                      b) Line graph  
c) Scatterplot                                    d) All of the mentioned above
- 10) Which of the following techniques would perform better for reducing dimensions of a data set?  
a) Removing columns which have too many missing values  
b) Removing columns which have high variance in data  
c) Removing columns with dissimilar data trends  
d) None of these
- 11) Clustering belongs to \_\_\_\_\_ data analysis.  
a) Supervised                                      b) Unsupervised  
c) Both a) and b)                                d) None of the mentioned above
- 12) What is the use of the bin/ binary data structure?  
a) to have efficient insertion                  b) to have efficient region query  
c) to have efficient deletion                   d) to have efficient traversal
- 13) \_\_\_\_\_ techniques can be used to reduce the number of values for a given continuous attribute, by dividing the range of the attribute into intervals.  
a) Discretization                                 b) Transformation  
c) Smoothing                                      d) Generalization
- 14) Which of the following method is used for finding optimal of cluster in K-Mean algorithm?  
a) Elbow method                                 b) Manhattan method  
c) C. Ecludian method                         d) All of the above

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full.

**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) Explain data scale types with suitable example.
- b) Write short note on “Structured Features”
- c) Explain kind of features in data science.
- d) What is meant by Dimensionality Reduction?
- e) Illustrate singular value decomposition method

**Q.3 Attempt any TWO.** **12**

- a) Explain in detail Principal Component Analysis (PCA).
- b) Explain how to improve the data quality.
- c) What do you mean by incomplete features?

**Section – II**

**Q.4 Attempt any FOUR.** **16**

- a) Explain the process of binarization.
- b) What is the Objective Function of k-Means?
- c) Explain the image gradients.
- d) Explain the convolution layer of Neural Network.
- e) Write variance scaling with examples.

**Q.5 Attempt any TWO.** **12**

- a) Explain in detail k-means clustering.
- b) Explain the manual feature Extraction HOG.
- c) Explain the log and power transform and its generalization in brief.

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following techniques would perform better for reducing dimensions of a data set?
  - a) Removing columns which have too many missing values
  - b) Removing columns which have high variance in data
  - c) Removing columns with dissimilar data trends
  - d) None of these
- 2) Clustering belongs to \_\_\_\_\_ data analysis.
  - a) Supervised
  - b) Unsupervised
  - c) Both a) and b)
  - d) None of the mentioned above
- 3) What is the use of the bin/ binary data structure?
  - a) to have efficient insertion
  - b) to have efficient region query
  - c) to have efficient deletion
  - d) to have efficient traversal
- 4) \_\_\_\_\_ techniques can be used to reduce the number of values for a given continuous attribute, by dividing the range of the attribute into intervals.
  - a) Discretization
  - b) Transformation
  - c) Smoothing
  - d) Generalization
- 5) Which of the following method is used for finding optimal of cluster in K-Mean algorithm?
  - a) Elbow method
  - b) Manhattan method
  - c) C. Ecludian method
  - d) All of the above
- 6) The Noise and outliers, missing values and duplicate data are problems of \_\_\_\_\_.
  - a) Processing data
  - b) Mapping Data
  - c) Evaluating data
  - d) Data quality
- 7) ANN stands for \_\_\_\_\_.
  - a) Ariel Neural Network
  - b) Artificial Neural Nucleus
  - c) Artificial Neural Network
  - d) Ariel Neural Nucleus
- 8) Create new attributes that can capture the important information in a data set much more efficiently than the original attributes \_\_\_\_\_.
  - a) Feature Creation
  - b) Feature Selection
  - c) PCA
  - d) All of the above

- 9) The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of \_\_\_\_\_.  
a) object detection                      b) object classification  
c) object clustering                      d) All of the above
- 10) Data Analysis is a process of \_\_\_\_\_.  
a) Inspecting data                      b) Cleaning data  
c) Transforming data                      d) All of the above
- 11) Amongst which of the following step is performed by data scientist after acquiring the data?  
a) Deletion                      b) Data Replication  
c) Data Integration                      d) Data Cleansing
- 12) Amongst which of the following is / are the true about regression analysis?  
a) Describes associations within the data  
b) Modeling relationships within the data  
c) Answering yes/no questions about the data  
d) All of the mentioned above
- 13) By normalizing relations or sets of relations, one minimizes \_\_\_\_\_.  
a) Data                      b) Fields  
c) Redundancy                      d) Database
- 14) A graph that uses vertical bars to represent data is called a \_\_\_\_\_.  
a) Bar graph                      b) Line graph  
c) Scatterplot                      d) All of the mentioned above

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full.

**Section – I**

**Q.2 Attempt any FOUR. 16**

- a) Explain data scale types with suitable example.
- b) Write short note on “Structured Features”
- c) Explain kind of features in data science.
- d) What is meant by Dimensionality Reduction?
- e) Illustrate singular value decomposition method

**Q.3 Attempt any TWO. 12**

- a) Explain in detail Principal Component Analysis (PCA).
- b) Explain how to improve the data quality.
- c) What do you mean by incomplete features?

**Section – II**

**Q.4 Attempt any FOUR. 16**

- a) Explain the process of binarization.
- b) What is the Objective Function of k-Means?
- c) Explain the image gradients.
- d) Explain the convolution layer of Neural Network.
- e) Write variance scaling with examples.

**Q.5 Attempt any TWO. 12**

- a) Explain in detail k-means clustering.
- b) Explain the manual feature Extraction HOG.
- c) Explain the log and power transform and its generalization in brief.

Seat No.	
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Set P
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Each question carries one mark  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which of the following managed components is responsible for relaying messages between communications channels such as MQTT, IPC, and the cloud?
  - a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these
- 2) Managing streams for real-time processing applies to the \_\_\_\_\_.
  - a) edge and the cloud
  - b) edge only
  - c) cloud only
  - d) None of these
- 3) Which of the following managed components is responsible for synchronizing the state between the edge and the cloud?
  - a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these
- 4) All of the logic of the component could be contained in the recipe life cycle scripts and does not require an \_\_\_\_\_.
  - a) artifact
  - b) config file
  - c) program
  - d) certificate
- 5) Bounded context and ubiquitous language are distinct concepts within \_\_\_\_\_.
  - a) data-driven design
  - b) domain-driven design
  - c) architecture-driven design
  - d) None of these
- 6) \_\_\_\_\_ can be deployed to IoT Greengrass devices either locally or remotely.
  - a) Group Version
  - b) Definition version
  - c) Components
  - d) Function Definition
- 7) The {"temperature": 70} message is an example of \_\_\_\_\_ data and is serializable.
  - a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 8) \_\_\_\_\_ is not the most optimized data format for big data processing.
  - a) Apache ORC
  - b) Parquet
  - c) AVRO
  - d) JSON



- 9) Image data from a camera and transmitted as binary data is an example of \_\_\_\_\_ data.
- a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 10) Who is the primary persona at the heart of any industrial solution?
- a) industrialists
  - b) operators and maintainers
  - c) programmers
  - d) data injectors
- 11) A single component can both reset configuration and \_\_\_\_\_ in a new configuration.
- a) restart
  - b) replace
  - c) merge
  - d) None of above
- 12) IoT Greengrass operates at the \_\_\_\_\_ layer of the OSI model.
- a) Physical
  - b) Network
  - c) Application
  - d) None of above
- 13) Edge devices can belong to multiple \_\_\_\_\_ and each thing group can define one active deployment.
- a) thing groups
  - b) thing artifacts
  - c) IAM roles
  - d) policies
- 14) Which of the following managed components is responsible for deploying a local MQTT broker and connecting leaf devices?
- a) Bridge
  - b) Moquette
  - c) Device shadows
  - d) None of these

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What are the three primary types of tools needed to deliver intelligence workloads at the edge?
- b) Describe one use case for the smart home vertical that ties in with one more of the key benefits for ML-powered edge solutions?
- c) What is the benefit of isolating your code and dependencies from other services?
- d) What is the benefit of using a publish/subscribe model to exchange messages?

**Q.3 Attempt any TWO.** **16**

- a) What is the benefit of decoupling services in your edge architecture?
- b) What do you think is the worst-case scenario if your home network router was compromised by an attacker but was still processing traffic as normal?
- c) What are the common components of an edge solution?

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Can you modify an artifact stored in the cloud after it has been included in a registered custom component?
- b) What is the benefit of performing a data modeling exercise?
- c) Discuss at least one benefit of using a serverless function for processing IoT data?
- d) What business intelligence (BI) services can you use for data exposition to end consumers?

**Q.5 Attempt any TWO.** **16**

- a) What are some examples that differentiate static and dynamic resources of an edge component?
- b) Is there any relevance of ETL architectures for edge computing?  
(Hint: Think lambda.)
- c) What do you think is necessary to have an operational data store or a data lake/data warehouse?

Seat No.	
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Set **Q**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Each question carries one mark  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ is not the most optimized data format for big data processing.
  - a) Apache ORC
  - b) Parquet
  - c) AVRO
  - d) JSON
- 2) Image data from a camera and transmitted as binary data is an example of \_\_\_\_\_ data.
  - a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 3) Who is the primary persona at the heart of any industrial solution?
  - a) industrialists
  - b) operators and maintainers
  - c) programmers
  - d) data injectors
- 4) A single component can both reset configuration and \_\_\_\_\_ in a new configuration.
  - a) restart
  - b) replace
  - c) merge
  - d) None of above
- 5) IoT Greengrass operates at the \_\_\_\_\_ layer of the OSI model.
  - a) Physical
  - b) Network
  - c) Application
  - d) None of above
- 6) Edge devices can belong to multiple \_\_\_\_\_ and each thing group can define one active deployment.
  - a) thing groups
  - b) thing artifacts
  - c) IAM roles
  - d) policies
- 7) Which of the following managed components is responsible for deploying a local MQTT broker and connecting leaf devices?
  - a) Bridge
  - b) Moquette
  - c) Device shadows
  - d) None of these
- 8) Which of the following managed components is responsible for relaying messages between communications channels such as MQTT, IPC, and the cloud?
  - a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these

- 9) Managing streams for real-time processing applies to the \_\_\_\_\_.  
a) edge and the cloud                      b) edge only  
c) cloud only                                  d) None of these
- 10) Which of the following managed components is responsible for synchronizing the state between the edge and the cloud?  
a) MQTT bridge                              b) Moquette  
c) device shadows                          d) None of these
- 11) All of the logic of the component could be contained in the recipe life cycle scripts and does not require an \_\_\_\_\_.  
a) artifact                                      b) config file  
c) program                                      d) certificate
- 12) Bounded context and ubiquitous language are distinct concepts within \_\_\_\_\_.  
a) data-driven design                      b) domain-driven design  
c) architecture-driven design              d) None of these
- 13) \_\_\_\_\_ can be deployed to IoT Greengrass devices either locally or remotely.  
a) Group Version                              b) Definition version  
c) Components                                  d) Function Definition
- 14) The {"temperature": 70} message is an example of \_\_\_\_\_ data and is serializable.  
a) Structured                                  b) Unstructured  
c) Semi structured                              d) None of above

<b>Seat No.</b>	
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**Set Q**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What are the three primary types of tools needed to deliver intelligence workloads at the edge?
- b) Describe one use case for the smart home vertical that ties in with one more of the key benefits for ML-powered edge solutions?
- c) What is the benefit of isolating your code and dependencies from other services?
- d) What is the benefit of using a publish/subscribe model to exchange messages?

**Q.3 Attempt any TWO.** **16**

- a) What is the benefit of decoupling services in your edge architecture?
- b) What do you think is the worst-case scenario if your home network router was compromised by an attacker but was still processing traffic as normal?
- c) What are the common components of an edge solution?

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Can you modify an artifact stored in the cloud after it has been included in a registered custom component?
- b) What is the benefit of performing a data modeling exercise?
- c) Discuss at least one benefit of using a serverless function for processing IoT data?
- d) What business intelligence (BI) services can you use for data exposition to end consumers?

**Q.5 Attempt any TWO.** **16**

- a) What are some examples that differentiate static and dynamic resources of an edge component?
- b) Is there any relevance of ETL architectures for edge computing?  
(Hint: Think lambda.)
- c) What do you think is necessary to have an operational data store or a data lake/data warehouse?

Seat No.	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Each question carries one mark  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A single component can both reset configuration and \_\_\_\_\_ in a new configuration.
  - a) restart
  - b) replace
  - c) merge
  - d) None of above
- 2) IoT Greengrass operates at the \_\_\_\_\_ layer of the OSI model.
  - a) Physical
  - b) Network
  - c) Application
  - d) None of above
- 3) Edge devices can belong to multiple \_\_\_\_\_ and each thing group can define one active deployment.
  - a) thing groups
  - b) thing artifacts
  - c) IAM roles
  - d) policies
- 4) Which of the following managed components is responsible for deploying a local MQTT broker and connecting leaf devices?
  - a) Bridge
  - b) Moquette
  - c) Device shadows
  - d) None of these
- 5) Which of the following managed components is responsible for relaying messages between communications channels such as MQTT, IPC, and the cloud?
  - a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these
- 6) Managing streams for real-time processing applies to the \_\_\_\_\_.
  - a) edge and the cloud
  - b) edge only
  - c) cloud only
  - d) None of these
- 7) Which of the following managed components is responsible for synchronizing the state between the edge and the cloud?
  - a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these
- 8) All of the logic of the component could be contained in the recipe life cycle scripts and does not require an \_\_\_\_\_.
  - a) artifact
  - b) config file
  - c) program
  - d) certificate

- 9) Bounded context and ubiquitous language are distinct concepts within \_\_\_\_.
- a) data-driven design
  - b) domain-driven design
  - c) architecture-driven design
  - d) None of these
- 10) \_\_\_\_\_ can be deployed to IoT Greengrass devices either locally or remotely.
- a) Group Version
  - b) Definition version
  - c) Components
  - d) Function Definition
- 11) The {"temperature": 70} message is an example of \_\_\_\_\_ data and is serializable.
- a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 12) \_\_\_\_\_ is not the most optimized data format for big data processing.
- a) Apache ORC
  - b) Parquet
  - c) AVRO
  - d) JSON
- 13) Image data from a camera and transmitted as binary data is an example of \_\_\_\_\_ data.
- a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 14) Who is the primary persona at the heart of any industrial solution?
- a) industrialists
  - b) operators and maintainers
  - c) programmers
  - d) data injectors

<b>Seat No.</b>	
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**Set R**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any THREE. 12**

- a) What are the three primary types of tools needed to deliver intelligence workloads at the edge?
- b) Describe one use case for the smart home vertical that ties in with one more of the key benefits for ML-powered edge solutions?
- c) What is the benefit of isolating your code and dependencies from other services?
- d) What is the benefit of using a publish/subscribe model to exchange messages?

**Q.3 Attempt any TWO. 16**

- a) What is the benefit of decoupling services in your edge architecture?
- b) What do you think is the worst-case scenario if your home network router was compromised by an attacker but was still processing traffic as normal?
- c) What are the common components of an edge solution?

**Section – II**

**Q.4 Attempt any THREE. 12**

- a) Can you modify an artifact stored in the cloud after it has been included in a registered custom component?
- b) What is the benefit of performing a data modeling exercise?
- c) Discuss at least one benefit of using a serverless function for processing IoT data?
- d) What business intelligence (BI) services can you use for data exposition to end consumers?

**Q.5 Attempt any TWO. 16**

- a) What are some examples that differentiate static and dynamic resources of an edge component?
- b) Is there any relevance of ETL architectures for edge computing?  
(Hint: Think lambda.)
- c) What do you think is necessary to have an operational data store or a data lake/data warehouse?



Seat No.	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Each question carries one mark  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ can be deployed to IoT Greengrass devices either locally or remotely.
 

a) Group Version	b) Definition version
c) Components	d) Function Definition
- 2) The {"temperature": 70} message is an example of \_\_\_\_\_ data and is serializable.
 

a) Structured	b) Unstructured
c) Semi structured	d) None of above
- 3) \_\_\_\_\_ is not the most optimized data format for big data processing.
 

a) Apache ORC	b) Parquet
c) AVRO	d) JSON
- 4) Image data from a camera and transmitted as binary data is an example of \_\_\_\_\_ data.
 

a) Structured	b) Unstructured
c) Semi structured	d) None of above
- 5) Who is the primary persona at the heart of any industrial solution?
 

a) industrialists	b) operators and maintainers
c) programmers	d) data injectors
- 6) A single component can both reset configuration and \_\_\_\_\_ in a new configuration.
 

a) restart	b) replace
c) merge	d) None of above
- 7) IoT Greengrass operates at the \_\_\_\_\_ layer of the OSI model.
 

a) Physical	b) Network
c) Application	d) None of above
- 8) Edge devices can belong to multiple \_\_\_\_\_ and each thing group can define one active deployment.
 

a) thing groups	b) thing artifacts
c) IAM roles	d) policies

- 9) Which of the following managed components is responsible for deploying a local MQTT broker and connecting leaf devices?
- a) Bridge
  - b) Moquette
  - c) Device shadows
  - d) None of these
- 10) Which of the following managed components is responsible for relaying messages between communications channels such as MQTT, IPC, and the cloud?
- a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these
- 11) Managing streams for real-time processing applies to the \_\_\_\_.
- a) edge and the cloud
  - b) edge only
  - c) cloud only
  - d) None of these
- 12) Which of the following managed components is responsible for synchronizing the state between the edge and the cloud?
- a) MQTT bridge
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  - c) device shadows
  - d) None of these
- 13) All of the logic of the component could be contained in the recipe life cycle scripts and does not require an \_\_\_\_.
- a) artifact
  - b) config file
  - c) program
  - d) certificate
- 14) Bounded context and ubiquitous language are distinct concepts within \_\_\_\_.
- a) data-driven design
  - b) domain-driven design
  - c) architecture-driven design
  - d) None of these

<b>Seat No.</b>	
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**Set S**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What are the three primary types of tools needed to deliver intelligence workloads at the edge?
- b) Describe one use case for the smart home vertical that ties in with one more of the key benefits for ML-powered edge solutions?
- c) What is the benefit of isolating your code and dependencies from other services?
- d) What is the benefit of using a publish/subscribe model to exchange messages?

**Q.3 Attempt any TWO.** **16**

- a) What is the benefit of decoupling services in your edge architecture?
- b) What do you think is the worst-case scenario if your home network router was compromised by an attacker but was still processing traffic as normal?
- c) What are the common components of an edge solution?

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Can you modify an artifact stored in the cloud after it has been included in a registered custom component?
- b) What is the benefit of performing a data modeling exercise?
- c) Discuss at least one benefit of using a serverless function for processing IoT data?
- d) What business intelligence (BI) services can you use for data exposition to end consumers?

**Q.5 Attempt any TWO.** **16**

- a) What are some examples that differentiate static and dynamic resources of an edge component?
- b) Is there any relevance of ETL architectures for edge computing?  
(Hint: Think lambda.)
- c) What do you think is necessary to have an operational data store or a data lake/data warehouse?

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
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  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
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  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
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  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
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  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
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  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.
- a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 10) Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-156**

<b>Seat No.</b>	
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<b>Set S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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Set	P
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850



- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks:10

10

- Page 7 of 12

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works



Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**ELECTRONICS ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
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- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set 

R
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T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022

**ELECTRONICS ENGINEERING****Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 2) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 3) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 4) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 5) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 6) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 7) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**ELECTRONICS ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 2) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 3) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 5) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 6) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 8) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 9) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 10) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks.

Marks: 10

10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later      b) Drink alcohol to relax  
c) Break it down into smaller task      d) Avoid the task

<b>Seat No.</b>	
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**Set**

<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Stress and Coping**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks

Marks:10

10

- Page 1 of 12



- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

- 9)** Human life is lived at four levels individuals, family, society and \_\_\_\_\_.  
a) Nature                                      b) Nurture  
c) World                                        d) Universe
- 10)** One of the basic desires of every human being is to be always \_\_\_\_\_.  
a) Happy                                        b) Sad  
c) Laugh                                        d) Earn money

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

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- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
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  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 2) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
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- 4) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
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  - c) Physical courage
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  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

- a) Culture
- c) Society

- b) Value  
d) Moral

- a) Moral  
c) Values

- b) Ethics
- d) Positive and preferred values

<b>Seat No.</b>	
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**Set**

<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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Set	P
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**T. Y. (B.Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Parity check bit coding is used for
  - a) Error correction
  - b) Error detection
  - c) Error correction and detection
  - d) None of the above
- 2) The channel capacity according to Shannon's equation is
  - a) Maximum error free communication
  - b) Defined for optimum system
  - c) Information transmitted
  - d) All of the above
- 3) According to Shannon Hartley theorem
  - a) The channel capacity becomes infinite with infinite bandwidth
  - b) The channel capacity does not become infinite with infinite bandwidth
  - c) Has a tradeoff between bandwidth and Signal to noise ratio
  - d) Both b and c are correct
- 4) The mutual information
  - a) Is symmetric
  - b) Always non negative
  - c) Both a and b are corrected
  - d) None of the above
- 5) Synchronization of signals is done using
  - a) Pilot clock
  - b) Extracting timing information from the received signal
  - c) Both a and b
  - d) None of the above
- 6) The data rate of QPSK is \_\_\_\_\_ of BPSK.
  - a) Thrice
  - b) Four times
  - c) Twice
  - d) Same
- 7) The bandwidth of BFSK is \_\_\_\_\_ than BPSK.
  - a) Lower
  - b) Same
  - c) Higher
  - d) Not predictable

- 8) Equalization in digital communication
- a) Reduces inter symbol interference
  - b) Removes distortion caused due to channel
  - c) Is done using linear filters
  - d) All of the above
- 9) Scrambling of data is
- a) Removing long strings of 1's and 0's
  - b) Exchanging of data
  - c) Transmission of digital data
  - d) All of the above
- 10) In Adaptive Delta Modulation, the slope error reduces and
- a) Quantization error decreases
  - b) Quantization error increases
  - c) Quantization error remains same
  - d) None of the above
- 11) DPCM is a technique
- a) To convert analog signal into digital signal
  - b) Where addition between successive samples of the analog signals are encoded into n-bit data streams
  - c) Where subtraction codes are the quantized values of the predicted value
  - d) All of the above
- 12) One of the disadvantages of PCM is
- a) It requires large bandwidth
  - b) Very high noise
  - c) Cannot be decoded easily
  - d) All of the above
- 13) The negative statement for Shannon's theorem states that
- a) If  $R > C$ , the error probability increases towards Unity
  - b) If  $R < C$ , the error probability is very small
  - c) Both a and b
  - d) None of the above
- 14) Entropy is
- a) Average information per message
  - b) Information in a signal
  - c) Amplitude of signal
  - d) All of the above

Seat No.	
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Set	P
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**T. Y. (B.Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of Steam tables and Mollier diagram is allowed.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- Draw the block diagram of digital communication system. Explain function of source encoder & channel encoder.
- Write Short Note on Data formats.
- Define discrete rate & Information rate.
- State sampling theorem. Explain Nyquist rate in detail.
- Explain ADM in detail.

**Q.3 Attempt any Two.** **12**

- Explain Duo-binary baseband PAM System in detail.
- Write Operation of
  - Scrambling
  - Unscrambling
- Apply Huffman coding procedure for the following message ensemble. Calculate efficiency of it.

[X] [X1 X2 X3 X4 X5]

[P] [0.4 0.2 0.2 0.1 0.1]

**Section – II**

**Q.4 Attempt any Four.** **16**

- Draw neat block diagram of QAM system. Explain its working.
- Define Pseudo noise sequences. Also explain properties of it.
- With the help of suitable waveform explain DPSK.
- With the help of basic principle explain frequency hopping of spread spectrums what are its advantages.
- Define need of error control coding.

**Q.5 Attempt any Two.** **12**

- Compare binary ASK, FSK & PSK.
- Describe M-Ary PSK encoding technique with neat block diagram.
- Explain DS-SS With coherent BPSK.

<b>Seat No.</b>	
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**T. Y. (B.Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Equalization in digital communication
  - a) Reduces inter symbol interference
  - b) Removes distortion caused due to channel
  - c) Is done using linear filters
  - d) All of the above
- 2) Scrambling of data is
  - a) Removing long strings of 1's and 0's
  - b) Exchanging of data
  - c) Transmission of digital data
  - d) All of the above
- 3) In Adaptive Delta Modulation, the slope error reduces and
  - a) Quantization error decreases
  - b) Quantization error increases
  - c) Quantization error remains same
  - d) None of the above
- 4) DPCM is a technique
  - a) To convert analog signal into digital signal
  - b) Where addition between successive samples of the analog signals are encoded into n-bit data streams
  - c) Where subtraction codes are the quantized values of the predicted value
  - d) All of the above
- 5) One of the disadvantages of PCM is
  - a) It requires large bandwidth
  - b) Very high noise
  - c) Cannot be decoded easily
  - d) All of the above
- 6) The negative statement for Shannon's theorem states that
  - a) If  $R > C$ , the error probability increases towards Unity
  - b) If  $R < C$ , the error probability is very small
  - c) Both a and b
  - d) None of the above

- 7) Entropy is  
a) Average information per message  
b) Information in a signal  
c) Amplitude of signal  
d) All of the above
- 8) Parity check bit coding is used for  
a) Error correction                      b) Error detection  
c) Error correction and detection    d) None of the above
- 9) The channel capacity according to Shannon's equation is  
a) Maximum error free communication  
b) Defined for optimum system  
c) Information transmitted  
d) All of the above
- 10) According to Shannon Hartley theorem  
a) The channel capacity becomes infinite with infinite bandwidth  
b) The channel capacity does not become infinite with infinite bandwidth  
c) Has a tradeoff between bandwidth and Signal to noise ratio  
d) Both b and c are correct
- 11) The mutual information  
a) Is symmetric                              b) Always non negative  
c) Both a and b are corrected          d) None of the above
- 12) Synchronization of signals is done using  
a) Pilot clock  
b) Extracting timing information from the received signal  
c) Both a and b  
d) None of the above
- 13) The data rate of QPSK is \_\_\_\_\_ of BPSK.  
a) Thrice                                      b) Four times  
c) Twice                                      d) Same
- 14) The bandwidth of BFSK is \_\_\_\_\_ than BPSK.  
a) Lower                                      b) Same  
c) Higher                                      d) Not predictable



Seat No.	
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**T. Y. (B.Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of Steam tables and Mollier diagram is allowed.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- Draw the block diagram of digital communication system. Explain function of source encoder & channel encoder.
- Write Short Note on Data formats.
- Define discrete rate & Information rate.
- State sampling theorem. Explain Nyquist rate in detail.
- Explain ADM in detail.

**Q.3 Attempt any Two.** **12**

- Explain Duo-binary baseband PAM System in detail.
- Write Operation of
  - Scrambling
  - Unscrambling
- Apply Huffman coding procedure for the following message ensemble. Calculate efficiency of it.

[X] [X1 X2 X3 X4 X5]

[P] [0.4 0.2 0.2 0.1 0.1]

**Section – II**

**Q.4 Attempt any Four.** **16**

- Draw neat block diagram of QAM system. Explain its working.
- Define Pseudo noise sequences. Also explain properties of it.
- With the help of suitable waveform explain DPSK.
- With the help of basic principle explain frequency hopping of spread spectrums what are its advantages.
- Define need of error control coding.

**Q.5 Attempt any Two.** **12**

- Compare binary ASK, FSK & PSK.
- Describe M-Ary PSK encoding technique with neat block diagram.
- Explain DS-SS With coherent BPSK.

Seat No.	
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Set **R**

**T. Y. (B.Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) DPCM is a technique
  - a) To convert analog signal into digital signal
  - b) Where addition between successive samples of the analog signals are encoded into n-bit data streams
  - c) Where subtraction codes are the quantized values of the predicted value
  - d) All of the above
- 2) One of the disadvantages of PCM is
  - a) It requires large bandwidth
  - b) Very high noise
  - c) Cannot be decoded easily
  - d) All of the above
- 3) The negative statement for Shannon's theorem states that
  - a) If  $R > C$ , the error probability increases towards Unity
  - b) If  $R < C$ , the error probability is very small
  - c) Both a and b
  - d) None of the above
- 4) Entropy is
  - a) Average information per message
  - b) Information in a signal
  - c) Amplitude of signal
  - d) All of the above
- 5) Parity check bit coding is used for
  - a) Error correction
  - b) Error detection
  - c) Error correction and detection
  - d) None of the above
- 6) The channel capacity according to Shannon's equation is
  - a) Maximum error free communication
  - b) Defined for optimum system
  - c) Information transmitted
  - d) All of the above
- 7) According to Shannon Hartley theorem
  - a) The channel capacity becomes infinite with infinite bandwidth
  - b) The channel capacity does not become infinite with infinite bandwidth
  - c) Has a tradeoff between bandwidth and Signal to noise ratio
  - d) Both b and c are correct

- 8) The mutual information
- a) Is symmetric
  - b) Always non negative
  - c) Both a and b are corrected
  - d) None of the above
- 9) Synchronization of signals is done using
- a) Pilot clock
  - b) Extracting timing information from the received signal
  - c) Both a and b
  - d) None of the above
- 10) The data rate of QPSK is \_\_\_\_\_ of BPSK.
- a) Thrice
  - b) Four times
  - c) Twice
  - d) Same
- 11) The bandwidth of BFSK is \_\_\_\_\_ than BPSK.
- a) Lower
  - b) Same
  - c) Higher
  - d) Not predictable
- 12) Equalization in digital communication
- a) Reduces inter symbol interference
  - b) Removes distortion caused due to channel
  - c) Is done using linear filters
  - d) All of the above
- 13) Scrambling of data is
- a) Removing long strings of 1's and 0's
  - b) Exchanging of data
  - c) Transmission of digital data
  - d) All of the above
- 14) In Adaptive Delta Modulation, the slope error reduces and
- a) Quantization error decreases
  - b) Quantization error increases
  - c) Quantization error remains same
  - d) None of the above

Seat No.	
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Set **R**

**T. Y. (B.Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of Steam tables and Mollier diagram is allowed.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Draw the block diagram of digital communication system. Explain function of source encoder & channel encoder.
- b) Write Short Note on Data formats.
- c) Define discrete rate & Information rate.
- d) State sampling theorem. Explain Nyquist rate in detail.
- e) Explain ADM in detail.

**Q.3 Attempt any Two.** **12**

- a) Explain Duo-binary baseband PAM System in detail.
- b) Write Operation of
  - i) Scrambling
  - ii) Unscrambling
- c) Apply Huffman coding procedure for the following message ensemble. Calculate efficiency of it.

[X] [X1 X2 X3 X4 X5]

[P] [0.4 0.2 0.2 0.1 0.1]

**Section – II**

**Q.4 Attempt any Four.** **16**

- a) Draw neat block diagram of QAM system. Explain its working.
- b) Define Pseudo noise sequences. Also explain properties of it.
- c) With the help of suitable waveform explain DPSK.
- d) With the help of basic principle explain frequency hopping of spread spectrums what are its advantages.
- e) Define need of error control coding.

**Q.5 Attempt any Two.** **12**

- a) Compare binary ASK, FSK & PSK.
- b) Describe M-Ary PSK encoding technique with neat block diagram.
- c) Explain DS-SS With coherent BPSK.

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Max. Marks: 70

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks: 14

14

- Page 10 of 12

- 8) The negative statement for Shannon's theorem states that
- a) If  $R > C$ , the error probability increases towards Unity
  - b) If  $R < C$ , the error probability is very small
  - c) Both a and b
  - d) None of the above
- 9) Entropy is
- a) Average information per message
  - b) Information in a signal
  - c) Amplitude of signal
  - d) All of the above
- 10) Parity check bit coding is used for
- a) Error correction
  - b) Error detection
  - c) Error correction and detection
  - d) None of the above
- 11) The channel capacity according to Shannon's equation is
- a) Maximum error free communication
  - b) Defined for optimum system
  - c) Information transmitted
  - d) All of the above
- 12) According to Shannon Hartley theorem
- a) The channel capacity becomes infinite with infinite bandwidth
  - b) The channel capacity does not become infinite with infinite bandwidth
  - c) Has a tradeoff between bandwidth and Signal to noise ratio
  - d) Both b and c are correct
- 13) The mutual information
- a) Is symmetric
  - b) Always non negative
  - c) Both a and b are corrected
  - d) None of the above
- 14) Synchronization of signals is done using
- a) Pilot clock
  - b) Extracting timing information from the received signal
  - c) Both a and b
  - d) None of the above

Seat No.	
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**T. Y. (B.Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Digital Communication**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of Steam tables and Mollier diagram is allowed.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- Draw the block diagram of digital communication system. Explain function of source encoder & channel encoder.
- Write Short Note on Data formats.
- Define discrete rate & Information rate.
- State sampling theorem. Explain Nyquist rate in detail.
- Explain ADM in detail.

**Q.3 Attempt any Two.** **12**

- Explain Duo-binary baseband PAM System in detail.
- Write Operation of
  - Scrambling
  - Unscrambling
- Apply Huffman coding procedure for the following message ensemble. Calculate efficiency of it.

[X] [X1 X2 X3 X4 X5]

[P] [0.4 0.2 0.2 0.1 0.1]

**Section – II**

**Q.4 Attempt any Four.** **16**

- Draw neat block diagram of QAM system. Explain its working.
- Define Pseudo noise sequences. Also explain properties of it.
- With the help of suitable waveform explain DPSK.
- With the help of basic principle explain frequency hopping of spread spectrums what are its advantages.
- Define need of error control coding.

**Q.5 Attempt any Two.** **12**

- Compare binary ASK, FSK & PSK.
- Describe M-Ary PSK encoding technique with neat block diagram.
- Explain DS-SS With coherent BPSK.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 1 of 16





Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- State and prove circular time reversal property of DFT of a DT signal.
- If  $x(n) = \{1, 5, 3, 2\}$  Determine
  - $x_1(n) = x((-n))_4$
  - $x_2(n) = x((n-1))_4$
- Compute 4-point DFT of the sequence  $x(n) = \{1, 3, 4, -5\}$
- Compute IDFT of  $X(k) = \{15, 2 + 3j, -3, 2-3j\}$
- Draw a direct form realization for the following linear phase FIR filters.  
 $h(n) = \{1, 5, 3, 7, 3, 5, 1\}$
- Compute 4-point circular convolution of sequences  $x(n) = \{1, 2, 3\}$  &  $h(n) = \{2, 5, 1, 4\}$

**Q.3 Solve any two of the following.** **12**

- List out the similarities and differences between DIT and DIF algorithms. Find DFT of the sequence  $x(n) = \{4, 3, 5, 7\}$  using DIT.
- Obtain Direct form I, Direct form II realizations for the system.  
 $y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$
- Obtain the output of a filter using overlap & add method whose input & impulse response are as below.  
 $x(n) = \{1, 2, 1, 3, 1, 4, 1, 5, 1, 6\}$  &  $h(n) = \{1, 2, 3\}$

**Section – II**

**Q.4 Solve any four of the following.** **16**

- Describe the applications of DSP in various fields.
- Explain in detail Multiply & Accumulate (MAC) unit of digital signal processor.
- Draw and explain the barrel shifter block of DSP chip.
- Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.
- Convert the analog filter to digital filter whose system function is

$$H(s) = \frac{(s + 0.3)}{(s + 0.3)^2 + 16}$$

Use bilinear transformation. Assume  $T = 1s$ .

- Given the desired specifications  $\Omega_p, \Omega_s, \delta_1, \delta_2$  of Butterworth filter derive the relation for obtaining order  $N$  & cutoff frequency  $\Omega_c$ .

**Q.5 Solve any two of the followings.**

- a) Explain in brief Impulse Invariant method.
- b) Design a digital Butterworth filter to meet the following constraints.
- $$0.9 \leq |H(e^{j\omega})| \leq 1 \qquad 0 \leq \omega \leq 0.5\pi$$
- $$|H(e^{j\omega})| \leq 0.2 \qquad 0.75\pi \leq \omega \leq \pi$$
- Using Bilinear transformation. Use  $T = 1$  sec.
- c) Explain finite word length effect in designing FIR filters.

Seat No.	
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Set Q
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) TMS320C54 processor uses \_\_\_\_\_ architecture.
  - a) Simple
  - b) Complex
  - c) Harvard
  - d) Von Neumann
- 2) The FIR filter of order M gives linear phase response if \_\_\_\_\_.
  - a)  $h(n) < \infty$
  - b)  $h(n) = h(-n)$
  - c)  $h(n) = h(M - 1 - n)$
  - d) None of these
- 3) With increase in the length of the filter, width of main lobe \_\_\_\_\_.
  - a) Increases
  - b) Decreases
  - c) Does not change
  - d) None of these
- 4) Which of the following has the best transition width characteristics?
  - a) Bartlett
  - b) Rectangular
  - c) Blackman
  - d) Hamming
- 5) FIR filters are \_\_\_\_\_.
  - a) All pole filters
  - b) All zero filters
  - c) Pole zero filters
  - d) Unstable filters
- 6) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.
  - a) Indirect addressing
  - b) Circular mode addressing
  - c) Bit reversed addressing
  - d) Memory mapped addressing
- 7) Butterworth filters have \_\_\_\_\_.
  - a) Wide transition region
  - b) Sharp transition region
  - c) Oscillation in transition region
  - d) Maximally flat pass band
- 8) Z-Transform reduces to Fourier transform when it is evaluated on \_\_\_\_\_.
  - a) a half circle
  - b) Z circle
  - c) Unit circle
  - d) Imaginary circle
- 9) The following realization minimizes the delay elements \_\_\_\_\_.
  - a) Direct form-I realization
  - b) Direct form-II realization
  - c) Cascade form realization
  - d) Parallel realization

- 10) DFT of an impulse function is \_\_\_\_\_.  
a)  $\delta[n]$  b) 1  
c)  $\delta[n - 1]$  d) None
- 11) The value of the twiddle factor  $W_4^5$  is \_\_\_\_\_.  
a)  $j$  b) 1  
c)  $-0.707 + j0.707$  d)  $-j$
- 12) With signal  $x(n) = \{2, 4, 3, -1, 7\}$ , if  $x_1(n) = x((n-3))_5$  then  $x_1(n)$  will be \_\_\_\_\_.  
a)  $\{3, -1, 7, 2, 4\}$  b)  $\{-1, 7, 2, 4, 3\}$   
c)  $\{4, 3, -1, 7, 2\}$  d)  $\{2, 4, 3, -1, 7\}$
- 13) The number of complex multiplications required with direct computation of N point DFT is  $N^2$ . After first step DIT FFT, this count reduces to \_\_\_\_\_.  
a)  $N^2 - 1$  b)  $N^2/2$   
c)  $N^2/2 + N/2$  d)  $N^2/2 - N/2$
- 14) If the linear convolution  $x_1 = [1, 2, 3, 4]$  and  $x_2 = [1, 2, 3]$  is  $\{1, 4, 10, 16, 17, 12\}$ , the 4-point circular convolution between  $x_1$  &  $x_2$  will be \_\_\_\_\_.  
a)  $\{1, 4, 10, 16\}$  b)  $\{10, 16, 17, 12\}$   
c)  $\{13, 21, 16, 17\}$  d)  $\{18, 16, 10, 16\}$

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- State and prove circular time reversal property of DFT of a DT signal.
- If  $x(n) = \{1, 5, 3, 2\}$  Determine
  - $x_1(n) = x((-n))_4$
  - $x_2(n) = x((n-1))_4$
- Compute 4-point DFT of the sequence  $x(n) = \{1, 3, 4, -5\}$
- Compute IDFT of  $X(k) = \{15, 2 + 3j, -3, 2-3j\}$
- Draw a direct form realization for the following linear phase FIR filters.  
 $h(n) = \{1, 5, 3, 7, 3, 5, 1\}$
- Compute 4-point circular convolution of sequences  $x(n) = \{1, 2, 3\}$  &  $h(n) = \{2, 5, 1, 4\}$

**Q.3 Solve any two of the following.** **12**

- List out the similarities and differences between DIT and DIF algorithms. Find DFT of the sequence  $x(n) = \{4, 3, 5, 7\}$  using DIT.
- Obtain Direct form I, Direct form II realizations for the system.  
 $y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$
- Obtain the output of a filter using overlap & add method whose input & impulse response are as below.  
 $x(n) = \{1, 2, 1, 3, 1, 4, 1, 5, 1, 6\}$  &  $h(n) = \{1, 2, 3\}$

**Section – II**

**Q.4 Solve any four of the following.** **16**

- Describe the applications of DSP in various fields.
- Explain in detail Multiply & Accumulate (MAC) unit of digital signal processor.
- Draw and explain the barrel shifter block of DSP chip.
- Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.
- Convert the analog filter to digital filter whose system function is

$$H(s) = \frac{(s + 0.3)}{(s + 0.3)^2 + 16}$$

Use bilinear transformation. Assume  $T = 1s$ .

- Given the desired specifications  $\Omega_p, \Omega_s, \delta_1, \delta_2$  of Butterworth filter derive the relation for obtaining order  $N$  & cutoff frequency  $\Omega_c$ .

**Q.5 Solve any two of the followings.**

- a) Explain in brief Impulse Invariant method.
- b) Design a digital Butterworth filter to meet the following constraints.
- $$0.9 \leq |H(e^{j\omega})| \leq 1 \qquad 0 \leq \omega \leq 0.5\pi$$
- $$|H(e^{j\omega})| \leq 0.2 \qquad 0.75\pi \leq \omega \leq \pi$$
- Using Bilinear transformation. Use  $T = 1$  sec.
- c) Explain finite word length effect in designing FIR filters.

Seat No.	
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Set R
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following has the best transition width characteristics?
  - a) Bartlett
  - b) Rectangular
  - c) Blackman
  - d) Hamming
- 2) FIR filters are \_\_\_\_\_.
  - a) All pole filters
  - b) All zero filters
  - c) Pole zero filters
  - d) Unstable filters
- 3) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.
  - a) Indirect addressing
  - b) Circular mode addressing
  - c) Bit reversed addressing
  - d) Memory mapped addressing
- 4) Butterworth filters have \_\_\_\_\_.
  - a) Wide transition region
  - b) Sharp transition region
  - c) Oscillation in transition region
  - d) Maximally flat pass band
- 5) Z-Transform reduces to Fourier transform when it is evaluated on \_\_\_\_\_.
  - a) a half circle
  - b) Z circle
  - c) Unit circle
  - d) Imaginary circle
- 6) The following realization minimizes the delay elements \_\_\_\_\_.
  - a) Direct form-I realization
  - b) Direct form-II realization
  - c) Cascade form realization
  - d) Parallel realization
- 7) DFT of an impulse function is \_\_\_\_\_.
  - a)  $\delta[n]$
  - b) 1
  - c)  $\delta[n - 1]$
  - d) None
- 8) The value of the twiddle factor  $W_4^5$  is \_\_\_\_\_.
  - a) j
  - b) 1
  - c)  $-0.707 + j0.707$
  - d)  $-j$
- 9) With signal  $x(n) = \{2, 4, 3, -1, 7\}$ , if  $x_1(n) = x((n-3))_5$  then  $x_1(n)$  will be \_\_\_\_\_.
  - a)  $\{3, -1, 7, 2, 4\}$
  - b)  $\{-1, 7, 2, 4, 3\}$
  - c)  $\{4, 3, -1, 7, 2\}$
  - d)  $\{2, 4, 3, -1, 7\}$



- 10) The number of complex multiplications required with direct computation of N point DFT is  $N^2$ . After first step DIT FFT, this count reduces to \_\_\_\_\_.  
a)  $N^2 - 1$                                       b)  $N^2/2$   
c)  $N^2/2 + N/2$                                 d)  $N^2/2 - N/2$
- 11) If the linear convolution  $x_1 = [1, 2, 3, 4]$  and  $x_2 = [1, 2, 3]$  is  $\{1, 4, 10, 16, 17, 12\}$ , the 4-point circular convolution between  $x_1$  &  $x_2$  will be \_\_\_\_\_.  
a)  $\{1, 4, 10, 16\}$                                 b)  $\{10, 16, 17, 12\}$   
c)  $\{13, 21, 16, 17\}$                              d)  $\{18, 16, 10, 16\}$
- 12) TMS320C54 processor uses \_\_\_\_\_ architecture.  
a) Simple    b) Complex  
c) Harvard                                        d) Von Neumann
- 13) The FIR filter of order M gives linear phase response if \_\_\_\_\_.  
a)  $h(n) < \infty$                                     b)  $h(n) = h(-n)$   
c)  $h(n) = h(M - 1 - n)$                     d) None of these
- 14) With increase in the length of the filter, width of main lobe \_\_\_\_\_.  
a) Increases                                      b) Decreases  
c) Does not change                              d) None of these

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- State and prove circular time reversal property of DFT of a DT signal.
- If  $x(n) = \{1, 5, 3, 2\}$  Determine
  - $x_1(n) = x((-n))_4$
  - $x_2(n) = x((n-1))_4$
- Compute 4-point DFT of the sequence  $x(n) = \{1, 3, 4, -5\}$
- Compute IDFT of  $X(k) = \{15, 2 + 3j, -3, 2-3j\}$
- Draw a direct form realization for the following linear phase FIR filters.  
 $h(n) = \{1, 5, 3, 7, 3, 5, 1\}$
- Compute 4-point circular convolution of sequences  $x(n) = \{1, 2, 3\}$  &  $h(n) = \{2, 5, 1, 4\}$

**Q.3 Solve any two of the following.** **12**

- List out the similarities and differences between DIT and DIF algorithms. Find DFT of the sequence  $x(n) = \{4, 3, 5, 7\}$  using DIT.
- Obtain Direct form I, Direct form II realizations for the system.  
 $y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$
- Obtain the output of a filter using overlap & add method whose input & impulse response are as below.  
 $x(n) = \{1, 2, 1, 3, 1, 4, 1, 5, 1, 6\}$  &  $h(n) = \{1, 2, 3\}$

**Section – II**

**Q.4 Solve any four of the following.** **16**

- Describe the applications of DSP in various fields.
- Explain in detail Multiply & Accumulate (MAC) unit of digital signal processor.
- Draw and explain the barrel shifter block of DSP chip.
- Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.
- Convert the analog filter to digital filter whose system function is

$$H(s) = \frac{(s + 0.3)}{(s + 0.3)^2 + 16}$$

Use bilinear transformation. Assume  $T = 1s$ .

- Given the desired specifications  $\Omega_p, \Omega_s, \delta_1, \delta_2$  of Butterworth filter derive the relation for obtaining order  $N$  & cutoff frequency  $\Omega_c$ .

**Q.5 Solve any two of the followings.**

- a) Explain in brief Impulse Invariant method.
- b) Design a digital Butterworth filter to meet the following constraints.
- $$0.9 \leq |H(e^{j\omega})| \leq 1 \qquad 0 \leq \omega \leq 0.5\pi$$
- $$|H(e^{j\omega})| \leq 0.2 \qquad 0.75\pi \leq \omega \leq \pi$$
- Using Bilinear transformation. Use  $T = 1$  sec.
- c) Explain finite word length effect in designing FIR filters.

<b>Seat No.</b>	
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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Assume suitable data if necessary.

Marks: 14

14

- Page 13 of 16

- 10)** Z-Transform reduces to Fourier transform when it is evaluated on \_\_\_\_\_.  
a) a half circle                      b) Z circle  
c) Unit circle                        d) Imaginary circle
- 11)** The following realization minimizes the delay elements \_\_\_\_\_.  
a) Direct form-I realization          b) Direct form-II realization  
c) Cascade form realization         d) Parallel realization
- 12)** DFT of an impulse function is \_\_\_\_\_.  
a)  $\delta[n]$                                 b) 1  
c)  $\delta[n - 1]$                            d) None
- 13)** The value of the twiddle factor  $W_4^5$  is \_\_\_\_\_.  
a) j                                        b) 1  
c)  $-0.707 + j0.707$                    d)  $-j$
- 14)** With signal  $x(n) = \{2, 4, 3, -1, 7\}$ , if  $x_1(n) = x((n-3))_5$  then  $x_1(n)$  will be \_\_\_\_\_.  
a)  $\{3, -1, 7, 2, 4\}$                     b)  $\{-1, 7, 2, 4, 3\}$   
c)  $\{4, 3, -1, 7, 2\}$                     d)  $\{2, 4, 3, -1, 7\}$

Seat No.	
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Set	S
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**

**ELECTRONICS ENGINEERING**

**Digital Signal Processing**

Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- State and prove circular time reversal property of DFT of a DT signal.
- If  $x(n) = \{1, 5, 3, 2\}$  Determine
  - $x_1(n) = x((-n))_4$
  - $x_2(n) = x((n-1))_4$
- Compute 4-point DFT of the sequence  $x(n) = \{1, 3, 4, -5\}$
- Compute IDFT of  $X(k) = \{15, 2 + 3j, -3, 2-3j\}$
- Draw a direct form realization for the following linear phase FIR filters.  
 $h(n) = \{1, 5, 3, 7, 3, 5, 1\}$
- Compute 4-point circular convolution of sequences  $x(n) = \{1, 2, 3\}$  &  $h(n) = \{2, 5, 1, 4\}$

**Q.3 Solve any two of the following.** **12**

- List out the similarities and differences between DIT and DIF algorithms. Find DFT of the sequence  $x(n) = \{4, 3, 5, 7\}$  using DIT.
- Obtain Direct form I, Direct form II realizations for the system.  
 $y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$
- Obtain the output of a filter using overlap & add method whose input & impulse response are as below.  
 $x(n) = \{1, 2, 1, 3, 1, 4, 1, 5, 1, 6\}$  &  $h(n) = \{1, 2, 3\}$

**Section – II**

**Q.4 Solve any four of the following.** **16**

- Describe the applications of DSP in various fields.
- Explain in detail Multiply & Accumulate (MAC) unit of digital signal processor.
- Draw and explain the barrel shifter block of DSP chip.
- Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.
- Convert the analog filter to digital filter whose system function is

$$H(s) = \frac{(s + 0.3)}{(s + 0.3)^2 + 16}$$

Use bilinear transformation. Assume  $T = 1s$ .

- Given the desired specifications  $\Omega_p, \Omega_s, \delta_1, \delta_2$  of Butterworth filter derive the relation for obtaining order  $N$  & cutoff frequency  $\Omega_c$ .

**Q.5 Solve any two of the followings.**

- a) Explain in brief Impulse Invariant method.
- b) Design a digital Butterworth filter to meet the following constraints.
- $$0.9 \leq |H(e^{j\omega})| \leq 1 \qquad 0 \leq \omega \leq 0.5\pi$$
- $$|H(e^{j\omega})| \leq 0.2 \qquad 0.75\pi \leq \omega \leq \pi$$
- Using Bilinear transformation. Use  $T = 1$  sec.
- c) Explain finite word length effect in designing FIR filters.

Seat No.	
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Set	P
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**T.Y. (B.Tech.) (Semester-I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The microprocessor of a computer can operate on any information if it is present in \_\_\_\_\_ only.
  - a) Program Counter
  - b) Flag
  - c) Main Memory
  - d) Secondary Memory
- 2) In 8-bit microprocessor, how many opcodes are present?
  - a) 246
  - b) 278
  - c) 250
  - d) 256
- 3) Which of the following is not true about the address bus?
  - a) It consists of control PIN 21 to 28
  - b) It is a bidirectional bus
  - c) It is 16 bits in length
  - d) Lower address bus lines ( $AD_0 - AD_7$ ) are called "Line number"
- 4) Which of the following is the correct sequence of operations in a microprocessor?
  - a) Opcode fetch, memory read, memory write, I/O read, I/O write
  - b) Opcode fetch, memory write, memory read, I/O read, I/O write
  - c) I/O read, opcode fetch, memory read, memory write, I/O write
  - d) I/O read, opcode fetch, memory write, memory read, I/O write
- 5) Which of the following is a special-purpose register of microprocessor?
 

a) Program counter	b) Instruction register
c) Accumulator	d) Temporary register
- 6) How many flip-flops are there in a flag register of 8085 microprocessor?
 

a) 4	b) 5
c) 7	d) 10



- 7) What does a microprocessor understand after decoding opcode?
- Perform ALU operation
  - Go to memory
  - Length of the instruction and number of operations
  - Go to the output device
- 8) When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?
- PSW
  - SP
  - DPTR
  - PC
- 9) How are the status of the carry, auxiliary carry and parity flag affected if the write instruction  
MOV A,#9C  
ADD A,#64H
- CY=0,AC=0,P=0
  - CY=1,AC=1,P=0
  - CY=0,AC=1,P=0
  - CY=1,AC=1,P=1
- 10) PSEN stands for\_\_\_\_\_
- Program Select Enable
  - Peripheral Store Enable
  - Program Store Enable
  - Peripheral Select Enable
- 11) How many rows and columns are present in a 16\*2 alphanumeric LCD?
- rows=2, columns=32
  - rows=16, columns=2
  - rows=16, columns=16
  - rows=2, columns=16
- 12) For writing commands on an LCD, RS bit is
- Set
  - Reset
  - Set & reset
  - none of the mentioned
- 13) What is the purpose of a special function register SPBRG in USART?
- To control the operation associated with baud rate generation
  - To control an oscillator frequency
  - To control or prevent the false bit transmission of 9<sup>th</sup> bit
  - All of the above
- 14) The capture operation in counter mode is feasible when mode of CCP module is \_\_\_\_.
- synchronized
  - asynchronized
  - synchronized as well as asynchronized
  - irrespective of synchronization

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Semester-I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any three** **12**

- a) Explain the interrupts structure of 8085.
- b) Explain different Addressing Modes of 8051 Microcontroller with examples.
- c) Explain the Memory organization & Mapping
- d) Explain difference between Microprocessor and Microcontroller.

**Q.3 Attempt any two** **16**

- a) Explain the microprocessor 8085 Architecture and instructions.
- b) Draw and explain architecture of intel-51, 8-bit Microcontroller.
- c) Explain different mode for serial communication for 8051 Microcontroller.

**Section – II**

**Q.4 Attempt any three** **12**

- a) Explain the architecture of PIC 16F877A.
- b) How SPI Protocol Works.
- c) Explain different Addressing Modes of PIC 16F877A.
- d) Explain Timer module in PIC 16F877A.

**Q.5 Attempt any two** **16**

- a) Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller 8051.
- b) Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.
- c) Explain CCP module in PIC 16F877A in detail.

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Semester-I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?
  - a) PSW
  - b) SP
  - c) DPTR
  - d) PC
- 2) How are the status of the carry, auxiliary carry and parity flag affected if the write instruction  
 MOV A,#9C  
 ADD A,#64H
  - a) CY=0,AC=0,P=0
  - b) CY=1,AC=1,P=0
  - c) CY=0,AC=1,P=0
  - d) CY=1,AC=1,P=1
- 3) PSEN stands for\_\_\_\_\_
  - a) Program Select Enable
  - b) Peripheral Store Enable
  - c) Program Store Enable
  - d) Peripheral Select Enable
- 4) How many rows and columns are present in a 16\*2 alphanumeric LCD?
  - a) rows=2, columns=32
  - b) rows=16, columns=2
  - c) rows=16, columns=16
  - d) rows=2, columns=16
- 5) For writing commands on an LCD, RS bit is
 

a) Set	b) Reset
c) Set & reset	d) none of the mentioned

- 6) What is the purpose of a special function register SPBRG in USART?
- a) To control the operation associated with baud rate generation
  - b) To control an oscillator frequency
  - c) To control or prevent the false bit transmission of 9<sup>th</sup> bit
  - d) All of the above
- 7) The capture operation in counter mode is feasible when mode of CCP module is \_\_\_\_.
- a) synchronized
  - b) asynchronized
  - c) synchronized as well as asynchronized
  - d) irrespective of synchronization
- 8) The microprocessor of a computer can operate on any information if it is present in \_\_\_\_ only.
- a) Program Counter
  - b) Flag
  - c) Main Memory
  - d) Secondary Memory
- 9) In 8-bit microprocessor, how many opcodes are present?
- a) 246
  - b) 278
  - c) 250
  - d) 256
- 10) Which of the following is not true about the address bus?
- a) It consists of control PIN 21 to 28
  - b) It is a bidirectional bus
  - c) It is 16 bits in length
  - d) Lower address bus lines (AD<sub>0</sub> – AD<sub>7</sub>) are called “Line number”
- 11) Which of the following is the correct sequence of operations in a microprocessor?
- a) Opcode fetch, memory read, memory write, I/O read, I/O write
  - b) Opcode fetch, memory write, memory read, I/O read, I/O write
  - c) I/O read, opcode fetch, memory read, memory write, I/O write
  - d) I/O read, opcode fetch, memory write, memory read, I/O write
- 12) Which of the following is a special-purpose register of microprocessor?
- a) Program counter
  - b) Instruction register
  - c) Accumulator
  - d) Temporary register
- 13) How many flip-flops are there in a flag register of 8085 microprocessor?
- a) 4
  - b) 5
  - c) 7
  - d) 10
- 14) What does a microprocessor understand after decoding opcode?
- a) Perform ALU operation
  - b) Go to memory
  - c) Length of the instruction and number of operations
  - d) Go to the output device

<b>Seat No.</b>	
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**Set Q**

**T.Y. (B.Tech.) (Semester-I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any three** **12**

- a) Explain the interrupts structure of 8085.
- b) Explain different Addressing Modes of 8051 Microcontroller with examples.
- c) Explain the Memory organization & Mapping
- d) Explain difference between Microprocessor and Microcontroller.

**Q.3 Attempt any two** **16**

- a) Explain the microprocessor 8085 Architecture and instructions.
- b) Draw and explain architecture of intel-51, 8-bit Microcontroller.
- c) Explain different mode for serial communication for 8051 Microcontroller.

**Section – II**

**Q.4 Attempt any three** **12**

- a) Explain the architecture of PIC 16F877A.
- b) How SPI Protocol Works.
- c) Explain different Addressing Modes of PIC 16F877A.
- d) Explain Timer module in PIC 16F877A.

**Q.5 Attempt any two** **16**

- a) Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller 8051.
- b) Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.
- c) Explain CCP module in PIC 16F877A in detail.

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B.Tech.) (Semester-I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) How many rows and columns are present in a 16\*2 alphanumeric LCD?
  - a) rows=2, columns=32
  - b) rows=16, columns=2
  - c) rows=16, columns=16
  - d) rows=2, columns=16
- 2) For writing commands on an LCD, RS bit is
  - a) Set
  - b) Reset
  - c) Set & reset
  - d) none of the mentioned
- 3) What is the purpose of a special function register SPBRG in USART?
  - a) To control the operation associated with baud rate generation
  - b) To control an oscillator frequency
  - c) To control or prevent the false bit transmission of 9<sup>th</sup> bit
  - d) All of the above
- 4) The capture operation in counter mode is feasible when mode of CCP module is \_\_\_\_\_.
  - a) synchronized
  - b) asynchronized
  - c) synchronized as well as asynchronized
  - d) irrespective of synchronization
- 5) The microprocessor of a computer can operate on any information if it is present in \_\_\_\_\_ only.
  - a) Program Counter
  - b) Flag
  - c) Main Memory
  - d) Secondary Memory
- 6) In 8-bit microprocessor, how many opcodes are present?
  - a) 246
  - b) 278
  - c) 250
  - d) 256

- 7) Which of the following is not true about the address bus?
- a) It consists of control PIN 21 to 28
  - b) It is a bidirectional bus
  - c) It is 16 bits in length
  - d) Lower address bus lines ( $AD_0 - AD_7$ ) are called "Line number"
- 8) Which of the following is the correct sequence of operations in a microprocessor?
- a) Opcode fetch, memory read, memory write, I/O read, I/O write
  - b) Opcode fetch, memory write, memory read, I/O read, I/O write
  - c) I/O read, opcode fetch, memory read, memory write, I/O write
  - d) I/O read, opcode fetch, memory write, memory read, I/O write
- 9) Which of the following is a special-purpose register of microprocessor?
- a) Program counter
  - b) Instruction register
  - c) Accumulator
  - d) Temporary register
- 10) How many flip-flops are there in a flag register of 8085 microprocessor?
- a) 4
  - b) 5
  - c) 7
  - d) 10
- 11) What does a microprocessor understand after decoding opcode?
- a) Perform ALU operation
  - b) Go to memory
  - c) Length of the instruction and number of operations
  - d) Go to the output device
- 12) When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?
- a) PSW
  - b) SP
  - c) DPTR
  - d) PC
- 13) How are the status of the carry, auxiliary carry and parity flag affected if the write instruction  
MOV A,#9C  
ADD A,#64H
- a)  $CY=0, AC=0, P=0$
  - b)  $CY=1, AC=1, P=0$
  - c)  $CY=0, AC=1, P=0$
  - d)  $CY=1, AC=1, P=1$
- 14) PSEN stands for\_\_\_\_\_
- a) Program Select Enable
  - b) Peripheral Store Enable
  - c) Program Store Enable
  - d) Peripheral Select Enable

Seat No.	
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Set **R**

**T.Y. (B.Tech.) (Semester-I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any three** **12**

- a) Explain the interrupts structure of 8085.
- b) Explain different Addressing Modes of 8051 Microcontroller with examples.
- c) Explain the Memory organization & Mapping
- d) Explain difference between Microprocessor and Microcontroller.

**Q.3 Attempt any two** **16**

- a) Explain the microprocessor 8085 Architecture and instructions.
- b) Draw and explain architecture of intel-51, 8-bit Microcontroller.
- c) Explain different mode for serial communication for 8051 Microcontroller.

**Section – II**

**Q.4 Attempt any three** **12**

- a) Explain the architecture of PIC 16F877A.
- b) How SPI Protocol Works.
- c) Explain different Addressing Modes of PIC 16F877A.
- d) Explain Timer module in PIC 16F877A.

**Q.5 Attempt any two** **16**

- a) Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller 8051.
- b) Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.
- c) Explain CCP module in PIC 16F877A in detail.



<b>Seat No.</b>	
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- 6) How many rows and columns are present in a 16\*2 alphanumeric LCD?  
a) rows=2, columns=32  
b) rows=16, columns=2  
c) rows=16, columns=16  
d) rows=2, columns=16
- 7) For writing commands on an LCD, RS bit is  
a) Set  
b) Reset  
c) Set & reset  
d) none of the mentioned
- 8) What is the purpose of a special function register SPBRG in USART?  
a) To control the operation associated with baud rate generation  
b) To control an oscillator frequency  
c) To control or prevent the false bit transmission of 9<sup>th</sup> bit  
d) All of the above
- 9) The capture operation in counter mode is feasible when mode of CCP module is \_\_\_\_\_.  
a) synchronized  
b) asynchronized  
c) synchronized as well as asynchronized  
d) irrespective of synchronization
- 10) The microprocessor of a computer can operate on any information if it is present in \_\_\_\_\_ only.  
a) Program Counter  
b) Flag  
c) Main Memory  
d) Secondary Memory
- 11) In 8-bit microprocessor, how many opcodes are present?  
a) 246  
b) 278  
c) 250  
d) 256
- 12) Which of the following is not true about the address bus?  
a) It consists of control PIN 21 to 28  
b) It is a bidirectional bus  
c) It is 16 bits in length  
d) Lower address bus lines ( $AD_0 - AD_7$ ) are called "Line number"
- 13) Which of the following is the correct sequence of operations in a microprocessor?  
a) Opcode fetch, memory read, memory write, I/O read, I/O write  
b) Opcode fetch, memory write, memory read, I/O read, I/O write  
c) I/O read, opcode fetch, memory read, memory write, I/O write  
d) I/O read, opcode fetch, memory write, memory read, I/O write
- 14) Which of the following is a special-purpose register of microprocessor?  
a) Program counter  
b) Instruction register  
c) Accumulator  
d) Temporary register

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Semester-I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Microcontrollers**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any three** **12**
- a) Explain the interrupts structure of 8085.
  - b) Explain different Addressing Modes of 8051 Microcontroller with examples.
  - c) Explain the Memory organization & Mapping
  - d) Explain difference between Microprocessor and Microcontroller.
- Q.3 Attempt any two** **16**
- a) Explain the microprocessor 8085 Architecture and instructions.
  - b) Draw and explain architecture of intel-51, 8-bit Microcontroller.
  - c) Explain different mode for serial communication for 8051 Microcontroller.

**Section – II**

- Q.4 Attempt any three** **12**
- a) Explain the architecture of PIC 16F877A.
  - b) How SPI Protocol Works.
  - c) Explain different Addressing Modes of PIC 16F877A.
  - d) Explain Timer module in PIC 16F877A.
- Q.5 Attempt any two** **16**
- a) Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller 8051.
  - b) Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.
  - c) Explain CCP module in PIC 16F877A in detail.

Seat No.	
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Set P
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electro Magnetic Engineering**

Day & Date: Tuesday 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Curl of gradient A is \_\_\_\_\_.  
 a)  $\nabla \times (\nabla A) = 1$   
 b)  $\nabla \times (\nabla A) = \infty$   
 c)  $\nabla \times (\nabla A) = 0$   
 d)  $\nabla \times (\nabla A) = -\infty$
- 2)  $\nabla^2$  is \_\_\_\_\_.  
 a) Vector  
 b) Scalar  
 c) Depend on direction  
 d) None of the above
- 3) Which of following is zero?  
 a) Grad div A  
 b) div Gradient V  
 c) div curl A  
 d) curl curl A
- 4) Electric dipole moment is given by \_\_\_\_\_.  
 a)  $P = Qd^2$   
 b)  $P = \Psi d^3$   
 c)  $P = Qd$   
 d) None of above
- 5) Relation between potential V & electric field E  
 a)  $E = -\nabla V$   
 b)  $E = \nabla V$   
 c)  $V = -\nabla E$   
 d)  $\nabla V = \nabla E$
- 6) Which of the following statement for a divergence of electric and magnetic flux densities?  
 a) Both are zero  
 b) It is zero for the electric flux density.  
 c) These are zero for static densities but non zero for time varying densities?  
 d) It is zero for the magnetic flux density.
- 7) The unit of relative permeability is \_\_\_\_\_.  
 a) henry/metre  
 b) henry  
 c) henry/sq.m  
 d) it is dimensionless
- 8) The property of coil by which a counter e.m.f. is induced in it when the current through the coil changes is known as  
 a) Self-inductance  
 b) Mutual inductance  
 c) Series aiding inductance  
 d) Capacitance

- Page 2 of 12

Seat No.	
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Set	P
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electro Magnetic Engineering**

Day & Date: Tuesday 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four questions. 16**

- Given  $A = 2\hat{a}_x + 4\hat{a}_y$  and  $B = 6\hat{a}_z$ , Find the Smaller angle between them using Cross product.
- State and Explain Biot Savarts law.
- Point charge of  $+3\mu C$  and  $-3\mu C$  located at (0,0,1) mm and (0,0,-1) mm respectively, Find E at (1,2,1.5) mm
- Explain differential components for cylindrical system.
- Derive the Lorentz's force equation for moving charges.

**Q.3 Answer any two questions. 12**

- Derive the expression for Electric field intensity due to infinite line charge.
- State the explain point form of Ampere's Law.
- Let  $E = \left(\frac{-6y}{x^2}\right)\hat{a}_x + \left(\frac{6}{x}\right)\hat{a}_y + 5\hat{a}_z$  V/m and calculate
  - $V_{PQ}$  given P(-7,2,1) & Q (4,1,2)
  - $V_P$  if  $V = 0$  at (2,0,-1)

**Section – II**

**Q.4 Answer any four questions. 16**

- State the Maxwell's Equation in integral and Point form derived from Faradays Law.
- Define the term displacement current and conduction current.
- Derive the transmission line equation stating with field theory.
- Define Directive Gain and Directivity of antenna.
- Explain the term Skin depth.

**Q.5 Answer any two questions. 12**

- A lossless  $100\Omega$  transmission line is terminated in  $200 + j200\Omega$ . Find
  - Voltage reflection coefficient
  - VSWR
  - Impedance at  $0.375\lambda$  from load
  - Shortest length of line for which impedance is purely resistive for 15V applied to the line
  - The value of this resistance
- State and derive poynting theorem and give its significance.
- Derive the equation for reflection coefficient and transmission coefficient by perfect dielectric medium for normal incidence.

Seat No.	
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Set Q
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electro Magnetic Engineering**

Day & Date: Tuesday 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The property of coil by which a counter e.m.f. is induced in it when the current through the coil changes is known as
  - a) Self-inductance
  - b) Mutual inductance
  - c) Series aiding inductance
  - d) Capacitance
- 2) For static magnetic field Maxwell's curl equation is given by
  - a)  $\nabla \cdot \vec{B} = \mu_0 \vec{J}$
  - b)  $\nabla \times \vec{B} = \mu_0 \vec{J}$
  - c)  $\nabla \times \vec{B} = 0$
  - d)  $\nabla \times \vec{B} = \mu_0 / \vec{J}$
- 3) A time varying magnetic field produces
  - a) both magnetic and electric fields
  - b) electric field only
  - c) magnetic field only
  - d) none of the above
- 4) A transmission line is specified in terms of \_\_\_\_\_.
  - a) R, G, L
  - b) G, L, C
  - c) R, G, L, C
  - d) None of these
- 5) In a fully lossless line,  $\sigma =$  \_\_\_\_\_.
  - a) 0
  - b) 1
  - c)  $\infty$
  - d) None of these
- 6) Antenna tuning is done by changing its \_\_\_\_\_.
  - a) Inductive reactances
  - b) Capacitive reactances
  - c) Both (a) and (b)
  - d) None of these
- 7) Resonant frequency of an antenna depends upon its \_\_\_\_\_.
  - a) Physical length
  - b) Electrical length
  - c) None of these
  - d) Cannot say
- 8) Curl of gradient A is \_\_\_\_\_.
  - a)  $\nabla \times (\nabla A) = 1$
  - b)  $\nabla \times (\nabla A) = \infty$
  - c)  $\nabla \times (\nabla A) = 0$
  - d)  $\nabla \times (\nabla A) = -\infty$
- 9)  $\nabla^2$  is \_\_\_\_\_.
  - a) Vector
  - b) Scalar
  - c) Depend on direction
  - d) None of the above

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Seat No.	
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Set **Q**

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electro Magnetic Engineering**

Day & Date: Tuesday 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four questions. 16**

- Given  $A = 2\hat{a}_x + 4\hat{a}_y$  and  $B = 6\hat{a}_z$ , Find the Smaller angle between them using Cross product.
- State and Explain Biot Savarts law.
- Point charge of  $+3\mu C$  and  $-3\mu C$  located at (0,0,1) mm and (0,0,-1) mm respectively, Find E at (1,2,1.5) mm
- Explain differential components for cylindrical system.
- Derive the Lorentz's force equation for moving charges.

**Q.3 Answer any two questions. 12**

- Derive the expression for Electric field intensity due to infinite line charge.
- State the explain point form of Ampere's Law.
- Let  $E = \left(\frac{-6y}{x^2}\right)\hat{a}_x + \left(\frac{6}{x}\right)\hat{a}_y + 5\hat{a}_z$  V/m and calculate
  - $V_{PQ}$  given P(-7,2,1) & Q (4,1,2)
  - $V_P$  if  $V = 0$  at (2,0,-1)

**Section – II**

**Q.4 Answer any four questions. 16**

- State the Maxwell's Equation in integral and Point form derived from Faradays Law.
- Define the term displacement current and conduction current.
- Derive the transmission line equation stating with field theory.
- Define Directive Gain and Directivity of antenna.
- Explain the term Skin depth.

**Q.5 Answer any two questions. 12**

- A lossless  $100\Omega$  transmission line is terminated in  $200 + j200\Omega$ . Find
  - Voltage reflection coefficient
  - VSWR
  - Impedance at  $0.375\lambda$  from load
  - Shortest length of line for which impedance is purely resistive for 15V applied to the line
  - The value of this resistance
- State and derive poynting theorem and give its significance.
- Derive the equation for reflection coefficient and transmission coefficient by perfect dielectric medium for normal incidence.

<b>Seat No.</b>	
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- 10) Which of the following statement for a divergence of electric and magnetic flux densities?
- Both are zero
  - It is zero for the electric flux density.
  - These are zero for static densities but non zero for time varying densities?
  - It is zero for the magnetic flux density.
- 11) The unit of relative permeability is \_\_\_\_.
- henry/metre
  - henry
  - henry/sq.m
  - it is dimensionless
- 12) The property of coil by which a counter e.m.f. is induced in it when the current through the coil changes is known as
- Self-inductance
  - Mutual inductance
  - Series aiding inductance
  - Capacitance
- 13) For static magnetic field Maxwell's curl equation is given by
- $\nabla \cdot \vec{B} = \mu_0 \vec{J}$
  - $\nabla \times \vec{B} = \mu_0 \vec{J}$
  - $\nabla \times \vec{B} = 0$
  - $\nabla \times \vec{B} = \mu_0 / \vec{J}$
- 14) A time varying magnetic field produces
- both magnetic and electric fields
  - electric field only
  - magnetic field only
  - none of the above

Seat No.	
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Set **R**

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electro Magnetic Engineering**

Day & Date: Tuesday 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four questions.** **16**

- Given  $A = 2\hat{a}_x + 4\hat{a}_y$  and  $B = 6\hat{a}_z$ , Find the Smaller angle between them using Cross product.
- State and Explain Biot Savarts law.
- Point charge of  $+3\mu C$  and  $-3\mu C$  located at (0,0,1) mm and (0,0,-1) mm respectively, Find E at (1,2,1.5) mm
- Explain differential components for cylindrical system.
- Derive the Lorentz's force equation for moving charges.

**Q.3 Answer any two questions.** **12**

- Derive the expression for Electric field intensity due to infinite line charge.
- State the explain point form of Ampere's Law.
- Let  $E = \left(\frac{-6y}{x^2}\right)\hat{a}_x + \left(\frac{6}{x}\right)\hat{a}_y + 5\hat{a}_z$  V/m and calculate
  - $V_{PQ}$  given P(-7,2,1) & Q (4,1,2)
  - $V_P$  if  $V = 0$  at (2,0,-1)

**Section – II**

**Q.4 Answer any four questions.** **16**

- State the Maxwell's Equation in integral and Point form derived from Faradays Law.
- Define the term displacement current and conduction current.
- Derive the transmission line equation stating with field theory.
- Define Directive Gain and Directivity of antenna.
- Explain the term Skin depth.

**Q.5 Answer any two questions.** **12**

- A lossless  $100\Omega$  transmission line is terminated in  $200 + j200\Omega$ . Find
  - Voltage reflection coefficient
  - VSWR
  - Impedance at  $0.375\lambda$  from load
  - Shortest length of line for which impedance is purely resistive for 15V applied to the line
  - The value of this resistance
- State and derive poynting theorem and give its significance.
- Derive the equation for reflection coefficient and transmission coefficient by perfect dielectric medium for normal incidence.

Seat No.	
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Set	S
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electro Magnetic Engineering**

Day & Date: Tuesday 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which of the following statement for a divergence of electric and magnetic flux densities?
  - a) Both are zero
  - b) It is zero for the electric flux density.
  - c) These are zero for static densities but non zero for time varying densities?
  - d) It is zero for the magnetic flux density.
- 2) The unit of relative permeability is \_\_\_\_\_.
  - a) henry/metre
  - b) henry
  - c) henry/sq.m
  - d) it is dimensionless
- 3) The property of coil by which a counter e.m.f. is induced in it when the current through the coil changes is known as
  - a) Self-inductance
  - b) Mutual inductance
  - c) Series aiding inductance
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- 4) For static magnetic field Maxwell's curl equation is given by
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  - b)  $\nabla \times \vec{B} = \mu_0 \vec{J}$
  - c)  $\nabla \times \vec{B} = 0$
  - d)  $\nabla \times \vec{B} = \mu_0 / \vec{J}$
- 5) A time varying magnetic field produces
  - a) both magnetic and electric fields
  - b) electric field only
  - c) magnetic field only
  - d) none of the above
- 6) A transmission line is specified in terms of \_\_\_\_\_.
  - a) R, G, L
  - b) G, L, C
  - c) R, G, L, C
  - d) None of these
- 7) In a fully lossless line,  $\sigma =$  \_\_\_\_\_.
  - a) 0
  - b) 1
  - c)  $\infty$
  - d) None of these

- 8) Antenna tuning is done by changing its \_\_\_\_\_.  
 a) Inductive reactances                      b) Capacitive reactances  
 c) Both (a) and (b)                              d) None of these
- 9) Resonant frequency of an antenna depends upon its \_\_\_\_\_.  
 a) Physical length                                  b) Electrical length  
 c) None of these                                   d) Cannot say
- 10) Curl of gradient A is \_\_\_\_\_.  
 a)  $\nabla \times (\nabla A) = 1$                               b)  $\nabla \times (\nabla A) = \infty$   
 c)  $\nabla \times (\nabla A) = 0$                                   d)  $\nabla \times (\nabla A) = -\infty$
- 11)  $\nabla^2$  is \_\_\_\_\_.  
 a) Vector    b) Scalar  
 c) Depend on direction                              d) None of the above
- 12) Which of following is zero?  
 a) Grad div A    b) div Gradient V  
 c) div curl A    d) curl curl A
- 13) Electric dipole moment is given by \_\_\_\_\_.  
 a)  $P = Qd^2$     b)  $P = \Psi d^3$   
 c)  $P = Qd$     d) None of above
- 14) Relation between potential V & electric field E  
 a)  $E = -\nabla V$     b)  $E = \nabla V$   
 c)  $V = -\nabla E$     d)  $\nabla V = \nabla E$

Seat No.	
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Set **S**

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electro Magnetic Engineering**

Day & Date: Tuesday 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four questions. 16**

- Given  $A = 2\hat{a}_x + 4\hat{a}_y$  and  $B = 6\hat{a}_z$ , Find the Smaller angle between them using Cross product.
- State and Explain Biot Savarts law.
- Point charge of  $+3\mu C$  and  $-3\mu C$  located at (0,0,1) mm and (0,0,-1) mm respectively, Find E at (1,2,1.5) mm
- Explain differential components for cylindrical system.
- Derive the Lorentz's force equation for moving charges.

**Q.3 Answer any two questions. 12**

- Derive the expression for Electric field intensity due to infinite line charge.
- State the explain point form of Ampere's Law.
- Let  $E = \left(\frac{-6y}{x^2}\right)\hat{a}_x + \left(\frac{6}{x}\right)\hat{a}_y + 5\hat{a}_z$  V/m and calculate
  - $V_{PQ}$  given P(-7,2,1) & Q (4,1,2)
  - $V_P$  if  $V = 0$  at (2,0,-1)

**Section – II**

**Q.4 Answer any four questions. 16**

- State the Maxwell's Equation in integral and Point form derived from Faradays Law.
- Define the term displacement current and conduction current.
- Derive the transmission line equation stating with field theory.
- Define Directive Gain and Directivity of antenna.
- Explain the term Skin depth.

**Q.5 Answer any two questions. 12**

- A lossless  $100\Omega$  transmission line is terminated in  $200 + j200\Omega$ . Find
  - Voltage reflection coefficient
  - VSWR
  - Impedance at  $0.375\lambda$  from load
  - Shortest length of line for which impedance is purely resistive for 15V applied to the line
  - The value of this resistance
- State and derive poynting theorem and give its significance.
- Derive the equation for reflection coefficient and transmission coefficient by perfect dielectric medium for normal incidence.

Seat No.	
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P

**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Information Technology and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) An IT project can produce \_\_\_\_\_.  
 a) a system  
 b) a software package  
 c) recommendation based on study  
 d) all of these
- 2) Select appropriate sequence \_\_\_\_\_.  
 a) database, data, knowledge, information  
 b) data, database, knowledge, information  
 c) data, database, information, knowledge  
 d) information, database, knowledge, data
- 3) Which of below is an example of TPS \_\_\_\_\_.  
 a) business intelligence                      b) payroll  
 c) ERP    d) expert system
- 4) \_\_\_\_\_ and \_\_\_\_\_ are the two views of database  
 a) action, query                                      b) partitioned, replicated  
 c) information, knowledge                      d) physical, logical
- 5) The processes required to ensure that the project includes all the work required, is part of project \_\_\_\_\_ management.  
 a) integration                                      b) scope  
 c) cost    d) quality
- 6) A \_\_\_\_\_ query is simply a data retrieval query.  
 a) action    b) get  
 c) select    d) all of these
- 7) Two types of decision support systems are  
 a) model driven, data driven                      b) data based, information based  
 c) middle, upper                                      d) TPS, ERP





<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Information Technology and Management**

Day & Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any Two.** **12**

- a) Explain partitioned database with – diagram, advantages and disadvantages
- b) With suitable examples explain any two e - payment systems used in India.
- c) What are components of information system? Discuss with suitable diagram.

**Q.3 Attempt any Four.** **16**

- a) Differentiate – data mart Vs data warehouse
- b) Justify with example – IT flattens organization structure
- c) To whom IT supports in a typical organization?
- d) Discuss Cloud Computing - SAAS model
- e) How IT infrastructure for a typical organization is decided?

**Section – II**

**Q.4 Attempt any Two.** **12**

- a) Justify : IT projects are as complex as other engineering projects.
- b) Discuss need of and how supply chain management system is being implemented.
- c) Explain economical impact of IS on organization.

**Q.5 Attempt any Four.** **16**

- a) Discuss ethical issues related to information systems.
- b) With a typical example explain decision support system
- c) Compare OLAP and OLTP
- d) What is deskilling and alienation? Comment on how it is rising because of IT.
- e) What are the types of IPR?

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Marks: 14

- 1) Take odd man out – NEFT, ERP, RTGS, UPI
  - a) NEFT
  - b) ERP
  - c) RTGS
  - d) UPI
- 2) In \_\_\_\_\_ model, typically, the outcome of one phase acts as the input for the next phase sequentially.
  - a) RAD
  - b) Waterfall
  - c) Prototyping
  - d) SDLC
- 3) Which of below is not true about organizations?
  - a) closed system
  - b) social unit
  - c) interact with environment
  - d) have a structure
- 4) Which of below is a component of an IS?
  - a) Purpose
  - b) Context
  - c) Hardware
  - d) All of these
- 5) What for IS & IT are used in Digital Enterprises?
  - a) Research
  - b) Boost employee productive
  - c) Customer support
  - d) All of these
- 6) \_\_\_\_\_ are software system designed to support machine to machine interaction over a network
  - a) Information technology
  - b) Cloud computing
  - c) Web services
  - d) Apps
- 7) Take odd man out - MS Project, MS Access, DB2, Oracle
  - a) MS Word
  - b) MS Access
  - c) DB2
  - d) Oracle

- 8) An IT project can produce \_\_\_\_\_.  
a) a system  
b) a software package  
c) recommendation based on study  
d) all of these
- 9) Select appropriate sequence \_\_\_\_\_.  
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d) information, database, knowledge, data
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- 11) \_\_\_\_\_ and \_\_\_\_\_ are the two views of database  
a) action, query                                  b) partitioned, replicated  
c) information, knowledge                      d) physical, logical
- 12) The processes required to ensure that the project includes all the work required, is part of project \_\_\_\_\_ management.  
a) integration                                      b) scope  
c) cost    d) quality
- 13) A \_\_\_\_\_ query is simply a data retrieval query.  
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c) middle, upper                                      d) TPS, ERP

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T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022

**ELECTRONICS ENGINEERING****Information Technology and Management**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

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**Section – I****Q.2 Attempt any Two.** **12**

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- c) What are components of information system? Discuss with suitable diagram.

**Q.3 Attempt any Four.** **16**

- a) Differentiate – data mart Vs data warehouse
- b) Justify with example – IT flattens organization structure
- c) To whom IT supports in a typical organization?
- d) Discuss Cloud Computing - SAAS model
- e) How IT infrastructure for a typical organization is decided?

**Section – II****Q.4 Attempt any Two.** **12**

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- c) Explain economical impact of IS on organization.

**Q.5 Attempt any Four.** **16**

- a) Discuss ethical issues related to information systems.
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Seat No.	
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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Information Technology and Management**

Day & Date: Thursday, 09-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of below is a component of an IS?
 

a) Purpose	b) Context
c) Hardware	d) All of these
  
- 2) What for IS & IT are used in Digital Enterprises?
 

a) Research	b) Boost employee productive
c) Customer support	d) All of these
  
- 3) \_\_\_\_\_ are software system designed to support machine to machine interaction over a network
 

a) Information technology	b) Cloud computing
c) Web services	d) Apps
  
- 4) Take odd man out - MS Project, MS Access, DB2, Oracle
 

a) MS Word	b) MS Access
c) DB2	d) Oracle
  
- 5) An IT project can produce \_\_\_\_\_.
 

a) a system
b) a software package
c) recommendation based on study
d) all of these
  
- 6) Select appropriate sequence \_\_\_\_\_.
 

a) database, data, knowledge, information
b) data, database, knowledge, information
c) data, database, information, knowledge
d) information, database, knowledge, data
  
- 7) Which of below is an example of TPS \_\_\_\_\_.
 

a) business intelligence	b) payroll
c) ERP	d) expert system



<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Information Technology and Management**

Day & Date: Thursday, 09-02-2023

Max. Marks: 56

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**Section – II**

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Day & Date: Thursday, 09-02-2023  
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### MCQ/Objective Type Questions

Duration: 30 Minutes

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- 1) A \_\_\_\_\_ query is simply a data retrieval query.

a) action	b) get
c) select	d) all of these
- 2) Two types of decision support systems are

a) model driven, data driven	b) data based, information based
c) middle, upper	d) TPS, ERP
- 3) Take odd man out – NEFT, ERP, RTGS, UPI

a) NEFT	b) ERP
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- 13) \_\_\_\_\_ and \_\_\_\_\_ are the two views of database
  - a) action, query
  - b) partitioned, replicated
  - c) information, knowledge
  - d) physical, logical
- 14) The processes required to ensure that the project includes all the work required, is part of project \_\_\_\_\_ management.
  - a) integration
  - b) scope
  - c) cost
  - d) quality

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022****ELECTRONICS ENGINEERING****Information Technology and Management**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

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**Section – I****Q.2 Attempt any Two. 12**

- a) Explain partitioned database with – diagram, advantages and disadvantages
- b) With suitable examples explain any two e - payment systems used in India.
- c) What are components of information system? Discuss with suitable diagram.

**Q.3 Attempt any Four. 16**

- a) Differentiate – data mart Vs data warehouse
- b) Justify with example – IT flattens organization structure
- c) To whom IT supports in a typical organization?
- d) Discuss Cloud Computing - SAAS model
- e) How IT infrastructure for a typical organization is decided?

**Section – II****Q.4 Attempt any Two. 12**

- a) Justify : IT projects are as complex as other engineering projects.
- b) Discuss need of and how supply chain management system is being implemented.
- c) Explain economical impact of IS on organization.

**Q.5 Attempt any Four. 16**

- a) Discuss ethical issues related to information systems.
- b) With a typical example explain decision support system
- c) Compare OLAP and OLTP
- d) What is deskilling and alienation? Comment on how it is rising because of IT.
- e) What are the types of IPR?

Seat No.	
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Set

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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the following is considered production Economics?
  - a) Tilling of Soil
  - b) Singing a song before friends
  - c) Preventing a child from falling into a manhole on the road
  - d) Painting a picture for pleasure
- 2) Identify the Correct statement:
  - a) The Average Product is at its maximum when marginal product is equal to Average Product
  - b) The Law of Increasing returns to scale relates to the effect of changes in factor proportions.
  - c) Economies of scale arise only because of indivisibilities of factor proportions.
  - d) Internal economies of scale can accrue when industry expands beyond optimum.
- 3) Which of the following is not a characteristic of land?
  - a) Its supply for the economy is limited.
  - b) It's a immobile
  - c) Its usefulness depends on human efforts
  - d) It is produced by our forefathers.
- 4) Which of the following statement is true?
  - a) Accumulation of capital depends solely on income of individuals
  - b) Saving can be influenced by government policies
  - c) External economies go with size and internal economies with location
  - d) The supply curve of labour is an upward slopping curve
- 5) Macroeconomics is also called \_\_\_\_\_ Economics.
  - a) Applied
  - b) Aggregate
  - c) Experimental
  - d) None of the above
- 6) In Economics we use the term scarcity to mean
  - a) Abstract scarcity ad lack of resource in less developed countries
  - b) Relative scarcity i.e scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
  - d) Scarcity caused on account of excessive consumption by the rich

- 7) Business economics is
- a) Abstract and applies the tools of Microeconomics
  - b) Involves practice application of economic theory in business decision making
  - c) Incorporates tools from multiple disciplines.
  - d) (b) and (c) above
- 8) What implication (s) does resource scarcity have for the satisfaction of wants?
- a) Not all wants can be satisfied.
  - b) We will never be faced with the need to make a choice
  - c) We must develop ways to decrease our individual wants
  - d) The discovery of new natural resource is necessary to increase our ability to satisfy wants.
- 9) Which of the following is a normative statement
- a) Planned economies allocate resources via government development
  - b) Most transitional economies have experienced problems of falling output and rising prices over the past decade
  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
  - d) Reducing inequality should be a major priority for mixed economies
- 10) Demand for a commodity refers to :
- a) Desire backed by ability to pay for the commodity
  - b) Need for the commodity and willingness to pay for it
  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time
- 11) Contraction of demand is a result of:
- a) Decrease in the number of consumers
  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers
- 12) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
- a) The preference of the individual
  - b) His monetary income
  - c) Price of the commodity
  - d) Price of related goods.
- 13) Which of the following pairs of goods is an example of substitutes?
- a) Tea and sugar
  - b) Tea and coffee
  - c) Pen and ink
  - d) Shirts and trousers
- 14) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
- a) 0
  - b) 1
  - c) 1.5
  - d) 2

Seat No.	
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Set

P

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
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**SECTION – 1**

**Q.2 Attempt any Four.****16**

- Define Managerial Economics and Discuss its Scope, What is the importance of Managerial Economics.
- What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
- Define and Distinguish between Income Elasticity and price Elasticity.
- What is the Major Area of Business Decision Making? How dose Economic theory Contribute to Managerial decisions.
- What is meant by Utility? Distinguish Between Cardinal and Ordinal Concept of Utility.
- What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and illustrate Graphically.

**Q.3 Attempt any Two.****12**

- What are major Macro-economics Issues Related Directly to business decision making? What is their significance in Business decisions?
- What is meant by Utility? What are the conditions for Application of Law of Diminishing Utility?
- What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?

**SECTION – II**

**Q.4 Attempt any Four.****16**

- What is purpose of demand of casting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- What are the methods used for Forecasting demand? Discuss in detail the survey method of forecasting demand for consumer goods. What are the advantages and Limitations?
- Define and Distinguish between Arc Elasticity and Point Elasticity.
- What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- What is meant by production? Distinguish between Fixed and Variable Inputs.
- What is Opportunity Cost? Give some Examples of Opportunity Cost.

**Q.5 Attempt any Two.**

- a)** Explain following Cost Concepts with examples.
  - i) Variable Cost
  - ii) Fixed Cost
  - iii) Explicit Cost
  - iv) Implicit Cost
- b)** Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c)** Explain the Law of supply through a supply schedule and a supply curve. Why does a supply curve slop upward to the right? What factors cause a rightward shift in the supply curve?

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Set Q
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
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**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

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  - d) The discovery of new natural resource is necessary to increase our ability to satisfy wants.
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  - a) Planned economies allocate resources via government development
  - b) Most transitional economies have experienced problems of falling output and rising prices over the past decade
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  - d) Reducing inequality should be a major priority for mixed economies
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  - b) Need for the commodity and willingness to pay for it
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  - d) The quantity of the commodity demanded at a certain price during any particular period of time
- 4) Contraction of demand is a result of:
  - a) Decrease in the number of consumers
  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers
- 5) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
  - a) The preference of the individual
  - b) His monetary income
  - c) Price of the commodity
  - d) Price of related goods.



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Set	Q
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

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Max. Marks: 56

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**SECTION – 1**

**Q.2 Attempt any Four.** **16**

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**SECTION – II**

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- a) What is purpose of demand forecasting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
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- e) What is meant by production? Distinguish between Fixed and Variable Inputs.
- f) What is Opportunity Cost? Give some Examples of Opportunity Cost.

**Q.5 Attempt any Two.**

- a)** Explain following Cost Concepts with examples.
  - i) Variable Cost
  - ii) Fixed Cost
  - iii) Explicit Cost
  - iv) Implicit Cost
- b)** Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c)** Explain the Law of supply through a supply schedule and a supply curve. Why does a supply curve slop upward to the right? What factors cause a rightward shift in the supply curve?

Seat No.	
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Set 

R
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Contraction of demand is result of:
  - a) Decrease in the number of consumers
  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers
- 2) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
  - a) The preference of the individual
  - b) His monetary income
  - c) Price of the commodity
  - d) Price of related goods.
- 3) Which of the following pairs of goods is an example of substitutes?
 

a) Tea and sugar	b) Tea and coffee
c) Pen and ink	d) Shirts trousers
- 4) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
 

a) 0	b) 1
c) 1.5	d) 2
- 5) Which of the following is considered production Economics?
  - a) Tilling of Soil
  - b) Singing a song before friends
  - c) Preventing a child from falling into a manhole on the road
  - d) Painting a picture for pleasure
- 6) Identify the Correct statement:
  - a) The Average Product is at its maximum when marginal product is equal to Average Product
  - b) The Law of Increasing returns to scale relates to the effect of changes in factor proportions.
  - c) Economies of scale arise only because of indivisibilities of factor proportions.
  - d) Internal economies of scale can accrue when industry expands beyond optimum.

- 7) Which of the following is not a characteristic of land?
- a) Its supply for the economy is limited.
  - b) It's a immobile
  - c) Its usefulness depends on human efforts
  - d) It is produced by our forefathers.
- 8) Which of the following statement is true?
- a) Accumulation of capital depends solely on income of individuals
  - b) Saving can be influenced by government policies
  - c) External economies go with size and internal economies with location
  - d) The supply curve of labour is an upward sloping curve
- 9) Macroeconomics is also called \_\_\_\_\_ Economics.
- a) Applied
  - b) Aggregate
  - c) Experimental
  - d) None of the above
- 10) In Economics we use the term scarcity to mean
- a) Abstract scarcity ad lack of resource in less developed countries
  - b) Relative scarcity i.e scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
  - d) Scarcity caused on account of excessive consumption by the rich
- 11) Business economics is
- a) Abstract and applies the tools of Microeconomics
  - b) Involves practice application of economic theory in business decision making
  - c) Incorporates tools from multiple disciplines.
  - d) (b) and (c) above
- 12) What implication (s) dose resource scarcity have for the satisfaction of wants?
- a) Not all wants can be satisfied.
  - b) We will never be faced with the need to make a choices
  - c) We must develop ways to decrease our individual wants
  - d) The discovery of new natural resource is necessary to increase our ability to satisfy wants.
- 13) Which of the following is a normative statement
- a) Planned economies allocate resources Via government development
  - b) Most transitional economies have experienced problems of falling output and rising prices our past decade
  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
  - d) Reducing in inequality should be major priority for mixed economies
- 14) Demand for a commodity refers to :
- a) Desire backed by ability to pay for the commodity
  - b) Need for the commodity and willingness to pay for it
  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time

Seat No.	
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Set

R

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**SECTION – 1**

**Q.2 Attempt any Four.****16**

- Define Managerial Economics and Discuss its Scope, What is the importance of Managerial Economics.
- What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
- Define and Distinguish between Income Elasticity and price Elasticity.
- What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions.
- What is meant by Utility? Distinguish Between Cardinal and Ordinal Concept of Utility.
- What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and illustrate Graphically.

**Q.3 Attempt any Two.****12**

- What are major Macro-economics Issues Related Directly to business decision making? What is their significance in Business decisions?
- What is meant by Utility? What are the conditions for Application of Law of Diminishing Utility?
- What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?

**SECTION – II**

**Q.4 Attempt any Four.****16**

- What is purpose of demand forecasting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- What are the methods used for Forecasting demand? Discuss in detail the survey method of forecasting demand for consumer goods. What are the advantages and Limitations?
- Define and Distinguish between Arc Elasticity and Point Elasticity.
- What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- What is meant by production? Distinguish between Fixed and Variable Inputs.
- What is Opportunity Cost? Give some Examples of Opportunity Cost.

**Q.5 Attempt any Two.**

- a)** Explain following Cost Concepts with examples.
  - i) Variable Cost
  - ii) Fixed Cost
  - iii) Explicit Cost
  - iv) Implicit Cost
- b)** Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c)** Explain the Law of supply through a supply schedule and a supply curve. Why does a supply curve slop upward to the right? What factors cause a rightward shift in the supply curve?

Seat No.	
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Set 

S
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) In Economics we use the term scarcity to mean
  - a) Abstract scarcity and lack of resource in less developed countries
  - b) Relative scarcity i.e scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
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- 2) Business economics is
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  - b) Most transitional economies have experienced problems of falling output and rising prices over the past decade
  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
  - d) Reducing inequality should be a major priority for mixed economies
- 5) Demand for a commodity refers to :
  - a) Desire backed by ability to pay for the commodity
  - b) Need for the commodity and willingness to pay for it
  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time



- 6) Contraction of demand is result of:
- a) Decrease in the number of consumers
  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers
- 7) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
- a) The preference of the individual
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  - d) Price of related goods.
- 8) Which of the following pairs of goods is an example of substitutes?
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  - d) Shirts trousers
- 9) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
- a) 0
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- 10) Which of the following is considered production Economics?
- a) Tilling of Soil
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- 13) Which of the following statement is true?
- a) Accumulation of capital depends solely on income of individuals
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  - c) External economies go with size and internal economies with location
  - d) The supply curve of labour is an upward slopping curve
- 14) Macroeconomics is also called \_\_\_\_\_ Economics.
- a) Applied
  - b) Aggregate
  - c) Experimental
  - d) None of the above

Seat No.	
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Set

S

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**SECTION – 1**

**Q.2 Attempt any Four.****16**

- Define Managerial Economics and Discuss its Scope, What is the importance of Managerial Economics.
- What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
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- What is the Major Area of Business Decision Making? How dose Economic theory Contribute to Managerial decisions.
- What is meant by Utility? Distinguish Between Cardinal and Ordinal Concept of Utility.
- What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and illustrate Graphically.

**Q.3 Attempt any Two.****12**

- What are major Macro-economics Issues Related Directly to business decision making? What is their significance in Business decisions?
- What is meant by Utility? What are the conditions for Application of Law of Diminishing Utility?
- What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?

**SECTION – II**

**Q.4 Attempt any Four.****16**

- What is purpose of demand of casting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- What are the methods used for Forecasting demand? Discuss in detail the survey method of forecasting demand for consumer goods. What are the advantages and Limitations?
- Define and Distinguish between Arc Elasticity and Point Elasticity.
- What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- What is meant by production? Distinguish between Fixed and Variable Inputs.
- What is Opportunity Cost? Give some Examples of Opportunity Cost.

**Q.5 Attempt any Two.**

- a)** Explain following Cost Concepts with examples.
  - i) Variable Cost
  - ii) Fixed Cost
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- b)** Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c)** Explain the Law of supply through a supply schedule and a supply curve. Why does a supply curve slop upward to the right? What factors cause a rightward shift in the supply curve?

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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**

**ELECTRONICS ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
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- 5) Which of the following is the reformist movement?
  - a) Chipko movement
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- 6) Who is the father of Indology?
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  - a) literature
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- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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Marks:10

**10**

- 1) What is the percentage of potable water on the earth?

a) 2%	b) 3%
c) 5%	d) 7%
- 2) Which of the following is the reformist movement?

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 3) Who is the father of Indology?

a) August Comte	b) Srinivas
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- 10) Which is distinctive nature of family?

a) Small family	b) Large family
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<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

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<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

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<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

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- Q.3 a) Explain the meaning and characteristics of human society.** **12**
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- b) What are the major trends in urbanization in developing countries?**
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Day & Date: Monday, 20-02-2023  
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3) Figures to the right indicates full marks.

Duration: 20 Minutes

**Q.1 Choose the correct alternatives from the options.**

- 1) Anxiety can cause the following moods \_\_\_\_\_.  
a) Irritable                      b) Nervous  
c) Anxious                        d) All of the above
- 2) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
a) Role stagnation                b) Role Isolation  
c) Role erosion                    d) Role ambiguity
- 3) Stress is \_\_\_\_\_ related to performance.  
a) Positively                        b) Negatively  
c) Proportionately                d) None of these
- 4) Which one is not considered as Environmental stressors?  
a) Weather                          b) Traffic  
c) Financial problems             d) Substandard housing
- 5) The following are the characteristics of Positive Stress.  
a) It improves performance      b) It feels exciting  
c) It motivates                      d) All of the above
- 6) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
a) Draw tight                        b) Stimulus  
c) Force                                d) Attitude
- 7) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
a) Medical                            b) Psychological  
c) Behavioral                        d) None of these
- 8) When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later            b) Drink alcohol to relax  
c) Break it down into smaller task   d) Avoid the task
- 9) A good way to prevent stress is \_\_\_\_\_.  
a) Drinking beverages high in caffeine  
b) Sitting ideal doing nothing  
c) Overeating  
d) Taking time out for relaxation

- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

**Seat  
No.**

Max. Marks: 50

Marks: 10

10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_.
- a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks:10

**10**

- Page 1 of 12



- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

- 9)** Human life is lived at four levels individuals, family, society and \_\_\_\_\_.  
a) Nature                                      b) Nurture  
c) World                                        d) Universe
- 10)** One of the basic desires of every human being is to be always \_\_\_\_\_.  
a) Happy                                        b) Sad  
c) Laugh                                        d) Earn money

<b>Seat No.</b>	
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**Set Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4 Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics



**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Professional Ethics & Human Value**

Max. Marks: 50

### MCQ/Objective Type Questions

Marks:10

10

- Page 10 of 12

- 9)** Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture                      b) Value  
c) Society                     d) Moral
- 10)** Virtues are \_\_\_\_\_.  
a) Moral                        b) Ethics  
c) Values                      d) Positive and preferred values

<b>Seat No.</b>	
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**Set**

<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022****ELECTRONICS ENGINEERING****Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

Seat No.	
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Set **P**

**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Computer Networks**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Select an appropriate option.****14**

- 1) The OSI model consists of \_\_\_\_\_ layers.
  - a) Five
  - b) Seven
  - c) Eight
  - d) Nine
- 2) End-to-end connectivity is provided from host-to-host in.
  - a) Network Layer
  - b) Session Layer
  - c) Data Link Layer
  - d) Transport Layer
- 3) What protocol is used between E-Mail servers.
  - a) FTP
  - b) SMTP
  - c) SNMP
  - d) POP3
- 4) CRC stands for \_\_\_\_\_.
  - a) cyclic redundancy check
  - b) code repeat check
  - c) code redundancy check
  - d) cyclic repeat check
- 5) Which of the following is the multiple access protocol for channel access control?
  - a) CSMA/CD
  - b) CSMA/CA
  - c) Both CSMA/CD & CSMA/CA
  - d) HDLC
- 6) The network layer is concerned with \_\_\_\_\_ of data.
  - a) bits
  - b) frames
  - c) packets
  - d) bytes
- 7) A 4 byte IP address consists of \_\_\_\_\_.
  - a) only network address
  - b) only host address
  - c) network address & host address
  - d) network address & MAC address
- 8) The network layer protocol for internet is \_\_\_\_\_.
  - a) Ethernet
  - b) internet protocol
  - c) hypertext transfer protocol
  - d) file transfer protocol
- 9) Which of the following are transport layer protocols used in networking?
  - a) TCP and FTP
  - b) UDP and HTTP
  - c) TCP and UDP
  - d) HTTP and FTP

- 10) Transport layer protocols deals with \_\_\_\_\_.
  - a) application to application communication
  - b) process to process communication
  - c) node to node communication
  - d) man to man communication
- 11) Which is not a application layer protocol.
  - a) HTTP
  - b) SMTP
  - c) FTP
  - d) TCP
- 12) Application layer offers \_\_\_\_\_ service.
  - a) End to end
  - b) Process to process
  - c) Both End to end and Process to process
  - d) None of the above
- 13) Which is a time-sensitive service.
  - a) File transfer
  - b) File download
  - c) E-mail
  - d) Internet telephony
- 14) Electronic mail uses which Application layer protocol.
  - a) SMTP
  - b) HTTP
  - c) FTP
  - d) SIP

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Computer Networks**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Solve any four of the following.** **12**
- Explain in brief of each layer in OSI model.
  - Elaborate IEEE802.4 & IEEE802.5.
  - Explain TCP/IP Model.
  - What is Internet Domain Name System? Draw & explain Domain Server message format.
- Q.3 Solve any two of the following.** **16**
- Explain distance vector routing with its limitations.
  - Differentiate between IPv4 and IPv6.
  - Elaborate Sub netting and Masking Protocol.

**Section – II**

- Q.4 Solve any four of the following.** **12**
- Describe Error detection and error correction Methods.
  - What is MAC? Explain different protocols of MAC.
  - Write difference between Bluetooth 5.1, 5.2.
  - Explain HTTP Protocol.
- Q.5 Solve any two of the following.** **16**
- Explain shortest path routing.
  - Explain TCP connection establishment, using three way handshaking.
  - Explain Flow control methods of Data link layer.

Set Q

**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Computer Networks**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Select an appropriate option.**

14

- 1) The network layer protocol for internet is \_\_\_\_\_.  
a) Ethernet                                      b) internet protocol  
c) hypertext transfer protocol          d) file transfer protocol
- 2) Which of the following are transport layer protocols used in networking?  
a) TCP and FTP                                b) UDP and HTTP  
c) TCP and UDP                                d) HTTP and FTP
- 3) Transport layer protocols deals with \_\_\_\_\_.  
a) application to application communication  
b) process to process communication  
c) node to node communication  
d) man to man communication
- 4) Which is not a application layer protocol.  
a) HTTP    b) SMTP  
c) FTP     d) TCP
- 5) Application layer offers \_\_\_\_\_ service.  
a) End to end  
b) Process to process  
c) Both End to end and Process to process  
d) None of the above
- 6) Which is a time-sensitive service.  
a) File transfer                                b) File download  
c) E-mail                                        d) Internet telephony
- 7) Electronic mail uses which Application layer protocol.  
a) SMTP                                        b) HTTP  
c) FTP     d) SIP
- 8) The OSI model consists of \_\_\_\_\_ layers.  
a) Five    b) Seven  
c) Eight    d) Nine
- 9) End-to-end connectivity is provided from host-to-host in.  
a) Network Layer                                b) Session Layer  
c) Data Link Layer                                d) Transport Layer

- 10) What protocol is used between E-Mail servers.
  - a) FTP
  - b) SMTP
  - c) SNMP
  - d) POP3
- 11) CRC stands for \_\_\_\_\_.
  - a) cyclic redundancy check
  - b) code repeat check
  - c) code redundancy check
  - d) cyclic repeat check
- 12) Which of the following is the multiple access protocol for channel access control?
  - a) CSMA/CD
  - b) CSMA/CA
  - c) Both CSMA/CD & CSMA/CA
  - d) HDLC
- 13) The network layer is concerned with \_\_\_\_\_ of data.
  - a) bits
  - b) frames
  - c) packets
  - d) bytes
- 14) A 4 byte IP address consists of \_\_\_\_\_.
  - a) only network address
  - b) only host address
  - c) network address & host address
  - d) network address & MAC address



Seat No.	
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Set Q

**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Computer Networks**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Solve any four of the following.** **12**

- a) Explain in brief of each layer in OSI model.
- b) Elaborate IEEE802.4 & IEEE802.5.
- c) Explain TCP/IP Model.
- d) What is Internet Domain Name System? Draw & explain Domain Server message format.

**Q.3 Solve any two of the following.** **16**

- a) Explain distance vector routing with its limitations.
- b) Differentiate between IPv4 and IPv6.
- c) Elaborate Sub netting and Masking Protocol.

**Section – II**

**Q.4 Solve any four of the following.** **12**

- a) Describe Error detection and error correction Methods.
- b) What is MAC? Explain different protocols of MAC.
- c) Write difference between Bluetooth 5.1, 5.2.
- d) Explain HTTP Protocol.

**Q.5 Solve any two of the following.** **16**

- a) Explain shortest path routing.
- b) Explain TCP connection establishment, using three way handshaking.
- c) Explain Flow control methods of Data link layer.

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Set	R
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Computer Networks**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Select an appropriate option.**

**14**

- 1) Which is not a application layer protocol.
 

a) HTTP	b) SMTP
c) FTP	d) TCP
- 2) Application layer offers \_\_\_\_\_ service.
 

a) End to end
b) Process to process
c) Both End to end and Process to process
d) None of the above
- 3) Which is a time-sensitive service.
 

a) File transfer	b) File download
c) E-mail	d) Internet telephony
- 4) Electronic mail uses which Application layer protocol.
 

a) SMTP	b) HTTP
c) FTP	d) SIP
- 5) The OSI model consists of \_\_\_\_\_ layers.
 

a) Five	b) Seven
c) Eight	d) Nine
- 6) End-to-end connectivity is provided from host-to-host in.
 

a) Network Layer	b) Session Layer
c) Data Link Layer	d) Transport Layer
- 7) What protocol is used between E-Mail servers.
 

a) FTP	b) SMTP
c) SNMP	d) POP3
- 8) CRC stands for \_\_\_\_\_.
 

a) cyclic redundancy check	b) code repeat check
c) code redundancy check	d) cyclic repeat check
- 9) Which of the following is the multiple access protocol for channel access control?
 

a) CSMA/CD	b) CSMA/CA
c) Both CSMA/CD & CSMA/CA	d) HDLC

- 10) The network layer is concerned with \_\_\_\_\_ of data.
  - a) bits
  - b) frames
  - c) packets
  - d) bytes
- 11) A 4 byte IP address consists of \_\_\_\_\_.
  - a) only network address
  - b) only host address
  - c) network address & host address
  - d) network address & MAC address
- 12) The network layer protocol for internet is \_\_\_\_\_.
  - a) Ethernet
  - b) internet protocol
  - c) hypertext transfer protocol
  - d) file transfer protocol
- 13) Which of the following are transport layer protocols used in networking?
  - a) TCP and FTP
  - b) UDP and HTTP
  - c) TCP and UDP
  - d) HTTP and FTP
- 14) Transport layer protocols deals with \_\_\_\_\_.
  - a) application to application communication
  - b) process to process communication
  - c) node to node communication
  - d) man to man communication

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Computer Networks**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Solve any four of the following.** **12**
- a) Explain in brief of each layer in OSI model.
  - b) Elaborate IEEE802.4 & IEEE802.5.
  - c) Explain TCP/IP Model.
  - d) What is Internet Domain Name System? Draw & explain Domain Server message format.
- Q.3 Solve any two of the following.** **16**
- a) Explain distance vector routing with its limitations.
  - b) Differentiate between IPv4 and IPv6.
  - c) Elaborate Sub netting and Masking Protocol.

**Section – II**

- Q.4 Solve any four of the following.** **12**
- a) Describe Error detection and error correction Methods.
  - b) What is MAC? Explain different protocols of MAC.
  - c) Write difference between Bluetooth 5.1, 5.2.
  - d) Explain HTTP Protocol.
- Q.5 Solve any two of the following.** **16**
- a) Explain shortest path routing.
  - b) Explain TCP connection establishment, using three way handshaking.
  - c) Explain Flow control methods of Data link layer.

Seat No.	
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Set **S**

**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Computer Networks**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Select an appropriate option.****14**

- 1) The network layer is concerned with \_\_\_\_\_ of data.
  - a) bits
  - b) frames
  - c) packets
  - d) bytes
- 2) A 4 byte IP address consists of \_\_\_\_\_.
  - a) only network address
  - b) only host address
  - c) network address & host address
  - d) network address & MAC address
- 3) The network layer protocol for internet is \_\_\_\_\_.
  - a) Ethernet
  - b) internet protocol
  - c) hypertext transfer protocol
  - d) file transfer protocol
- 4) Which of the following are transport layer protocols used in networking?
  - a) TCP and FTP
  - b) UDP and HTTP
  - c) TCP and UDP
  - d) HTTP and FTP
- 5) Transport layer protocols deals with \_\_\_\_\_.
  - a) application to application communication
  - b) process to process communication
  - c) node to node communication
  - d) man to man communication
- 6) Which is not a application layer protocol.
  - a) HTTP
  - b) SMTP
  - c) FTP
  - d) TCP
- 7) Application layer offers \_\_\_\_\_ service.
  - a) End to end
  - b) Process to process
  - c) Both End to end and Process to process
  - d) None of the above
- 8) Which is a time-sensitive service.
  - a) File transfer
  - b) File download
  - c) E-mail
  - d) Internet telephony

- 9)** Electronic mail uses which Application layer protocol.
- |         |         |
|---------|---------|
| a) SMTP | b) HTTP |
| c) FTP  | d) SIP  |
- 10)** The OSI model consists of \_\_\_\_\_ layers.
- |          |          |
|----------|----------|
| a) Five  | b) Seven |
| c) Eight | d) Nine  |
- 11)** End-to-end connectivity is provided from host-to-host in.
- |                    |                    |
|--------------------|--------------------|
| a) Network Layer   | b) Session Layer   |
| c) Data Link Layer | d) Transport Layer |
- 12)** What protocol is used between E-Mail servers.
- |         |         |
|---------|---------|
| a) FTP  | b) SMTP |
| c) SNMP | d) POP3 |
- 13)** CRC stands for \_\_\_\_\_
- |                            |                        |
|----------------------------|------------------------|
| a) cyclic redundancy check | b) code repeat check   |
| c) code redundancy check   | d) cyclic repeat check |
- 14)** Which of the following is the multiple access protocol for channel access control?
- |                           |            |
|---------------------------|------------|
| a) CSMA/CD                | b) CSMA/CA |
| c) Both CSMA/CD & CSMA/CA | d) HDLC    |

Seat No.	
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Computer Networks**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Solve any four of the following.** **12**
- Explain in brief of each layer in OSI model.
  - Elaborate IEEE802.4 & IEEE802.5.
  - Explain TCP/IP Model.
  - What is Internet Domain Name System? Draw & explain Domain Server message format.
- Q.3 Solve any two of the following.** **16**
- Explain distance vector routing with its limitations.
  - Differentiate between IPv4 and IPv6.
  - Elaborate Sub netting and Masking Protocol.

**Section – II**

- Q.4 Solve any four of the following.** **12**
- Describe Error detection and error correction Methods.
  - What is MAC? Explain different protocols of MAC.
  - Write difference between Bluetooth 5.1, 5.2.
  - Explain HTTP Protocol.
- Q.5 Solve any two of the following.** **16**
- Explain shortest path routing.
  - Explain TCP connection establishment, using three way handshaking.
  - Explain Flow control methods of Data link layer.

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Don't forget to mention Question paper Set (P/Q/R/S) on top of page.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

Duration: 30 Minutes

Marks: 14

## 14

- 1) A \_\_\_\_\_ processor has less number of general purpose registers.

a) CICS	b) RISC
c) Both a & b	d) None of the above
- 2) ARM uses the \_\_\_\_\_ bit instruction set to improve code density.

a) 32	b) 64
c) 8	d) 16
- 3) The \_\_\_\_\_ assembler directive is used to store 32 bit data in memory.

a) ALIGN	b) DCD
c) DCB	d) DCW
- 4) \_\_\_\_\_ mode is the mode that the processor is in after reset.

a) System	b) Supervisory
c) User	d) Abort
- 5) LPC2148's maximum operating frequency is \_\_\_\_\_ MHz.

a) 100	b) 50
c) 80	d) 60
- 6) In LPC2148 \_\_\_\_\_ pin select register is used to configure port pins P1.16 to P1.31.

a) PINSEL2	b) IODIR2
c) PINSEL0	d) PINSEL1
- 7) In ARM7TDMI-S, S stands for \_\_\_\_\_.

a) System	b) Supervisory
c) Synthesizable	d) None of the above
- 8) Inter task communication can be done through \_\_\_\_\_.

a) Mailboxes	b) Message queues
c) Pipes	d) All of above
- 9) In \_\_\_\_\_ kernels, each task requires to do something to explicitly give up control of the CPU.

a) Non-preemptive	b) Preemptive
c) Micro	d) None of the above



- 10)** The \_\_\_\_\_ state corresponds to a task which resides in memory but has not been made available to the multitasking kernel.
- a) Waiting
  - b) Running
  - c) Ready
  - d) Dormant
- 11)** A \_\_\_\_\_ function is a function that can be used by more than one task without fear of data corruption.
- a) Non-reentrant
  - b) Reentrant
  - c) Swap
  - d) None of above
- 12)** A semaphore is a protocol mechanism used to: \_\_\_\_\_.
- a) Control access to a shared resource
  - b) Signal the occurrence of an event
  - c) Allow two tasks to synchronize their activities
  - d) All of above
- 13)** For real time operating systems, interrupt latency should be \_\_\_\_\_.
- a) minimal
  - b) maximum
  - c) zero
  - d) dependent on the scheduling
- 14)**  $\mu$ cos – II can manage up to \_\_\_\_\_ tasks.
- a) 32
  - b) 64
  - c) 128
  - d) 256

Seat No.	
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Embedded Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if wherever necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- Define embedded system. Explain major characteristics which differs embedded system from desktop computer.
- List down the differences between RISC and CISC architecture.
- Examine the content of all registers and memory locations after the execution of following instruction independently. (R7=0x00004000, R0=0x00000001, R1=0x00000002, R2=0x00000003, R3=0x00000004, R4=0x00000000)
  - LDMIA R7, {R0, R2-R4}
  - STMIA R7!, {R1, R3}
- Write an ARM ASM code to add two 64 bit numbers.
- Discuss the all GPIO registers of LPC2148 with one example each.

**Q.3 Solve any two of the following.** **12**

- Explain ARM programmer's model in detail. (Operating modes, Register model, Program status registers, Data types etc.)
- In RISC architecture an instruction requires four stages to execute: stage 1 (instruction fetch) requires 30 ns, stage 2 (instruction decode) = 9 ns, stage 3 (instruction execute) = 20 ns and stage 4 (store results) = 10 ns. An instruction must proceed through the stages in sequence. What is the minimum asynchronous time for any single instruction to complete?
- Write embedded C code to configure LPC2148 CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source. Discuss procedure for determining PLL setting and list required conditions.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- Discuss shared data problems and explain any one method to solve it.
- Define the context and context switching. What are the steps involved in  $\mu$ cos – II context switching?
- Elaborate the problem of priority inversion and mechanism to prevent the same with example.
- What is non-preemptive kernel? Elaborate in detail with example and proper diagram.
- List down the types of priority-based kernels. Discuss the preemptive kernel with example.

**Q.5 Solve any two of the followings.**

- a)** Elaborate with examples inter-task/process communication tool semaphore used in RTOS environment.
- b)** Define is a task? Sketch state transition diagram and discuss different task states in detail.
- c)** Create four RTOS tasks to blink LED's connected to LPC2148 port pins P0.4 through P0.7 at 1Hz, 1.5Hz, 2Hz and 2.5 Hz respectively.

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Don't forget to mention Question paper Set (P/Q/R/S) on top of page.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

Marks: 14

14

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Set **Q**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Embedded Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if wherever necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- Define embedded system. Explain major characteristics which differs embedded system from desktop computer.
- List down the differences between RISC and CISC architecture.
- Examine the content of all registers and memory locations after the execution of following instruction independently. (R7=0x00004000, R0=0x00000001, R1=0x00000002, R2=0x00000003, R3=0x00000004, R4=0x00000000)
  - LDMIA R7, {R0, R2-R4}
  - STMIA R7!, {R1, R3}
- Write an ARM ASM code to add two 64 bit numbers.
- Discuss the all GPIO registers of LPC2148 with one example each.

**Q.3 Solve any two of the following.** **12**

- Explain ARM programmer's model in detail. (Operating modes, Register model, Program status registers, Data types etc.)
- In RISC architecture an instruction requires four stages to execute: stage 1 (instruction fetch) requires 30 ns, stage 2 (instruction decode) = 9 ns, stage 3 (instruction execute) = 20 ns and stage 4 (store results) = 10 ns. An instruction must proceed through the stages in sequence. What is the minimum asynchronous time for any single instruction to complete?
- Write embedded C code to configure LPC2148 CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source. Discuss procedure for determining PLL setting and list required conditions.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- Discuss shared data problems and explain any one method to solve it.
- Define the context and context switching. What are the steps involved in  $\mu$ cos – II context switching?
- Elaborate the problem of priority inversion and mechanism to prevent the same with example.
- What is non-preemptive kernel? Elaborate in detail with example and proper diagram.
- List down the types of priority-based kernels. Discuss the preemptive kernel with example.

**Q.5 Solve any two of the followings.**

- a)** Elaborate with examples inter-task/process communication tool semaphore used in RTOS environment.
- b)** Define is a task? Sketch state transition diagram and discuss different task states in detail.
- c)** Create four RTOS tasks to blink LED's connected to LPC2148 port pins P0.4 through P0.7 at 1Hz, 1.5Hz, 2Hz and 2.5 Hz respectively.

Seat No.	
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Set 

R
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Embedded Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Don't forget to mention Question paper Set (P/Q/R/S) on top of page.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A \_\_\_\_\_ function is a function that can be used by more than one task without fear of data corruption.
  - a) Non-reentrant
  - b) Reentrant
  - c) Swap
  - d) None of above
- 2) A semaphore is a protocol mechanism used to: \_\_\_\_\_.
  - a) Control access to a shared resource
  - b) Signal the occurrence of an event
  - c) Allow two tasks to synchronize their activities
  - d) All of above
- 3) For real time operating systems, interrupt latency should be \_\_\_\_\_.
  - a) minimal
  - b) maximum
  - c) zero
  - d) dependent on the scheduling
- 4)  $\mu$ cos – II can manage up to \_\_\_\_\_ tasks.
  - a) 32
  - b) 64
  - c) 128
  - d) 256
- 5) A \_\_\_\_\_ processor has less number of general purpose registers.
  - a) CICS
  - b) RISC
  - c) Both a & b
  - d) None of the above
- 6) ARM uses the \_\_\_\_\_ bit instruction set to improve code density.
  - a) 32
  - b) 64
  - c) 8
  - d) 16
- 7) The \_\_\_\_\_ assembler directive is used to store 32 bit data in memory.
  - a) ALIGN
  - b) DCD
  - c) DCB
  - d) DCW
- 8) \_\_\_\_\_ mode is the mode that the processor is in after reset.
  - a) System
  - b) Supervisory
  - c) User
  - d) Abort
- 9) LPC2148's maximum operating frequency is \_\_\_\_\_ MHz.
  - a) 100
  - b) 50
  - c) 80
  - d) 60



- 10)** In LPC2148 \_\_\_\_\_ pin select register is used to configure port pins P1.16 to P1.31.
- |            |            |
|------------|------------|
| a) PINSEL2 | b) IODIR2  |
| c) PINSEL0 | d) PINSEL1 |
- 11)** In ARM7TDMI-S, S stands for \_\_\_\_\_.
- |                  |                      |
|------------------|----------------------|
| a) System        | b) Supervisory       |
| c) Synthesizable | d) None of the above |
- 12)** Inter task communication can be done through \_\_\_\_\_.
- |              |                   |
|--------------|-------------------|
| a) Mailboxes | b) Message queues |
| c) Pipes     | d) All of above   |
- 13)** In \_\_\_\_\_ kernels, each task requires to do something to explicitly give up control of the CPU.
- |                   |                      |
|-------------------|----------------------|
| a) Non-preemptive | b) Preemptive        |
| c) Micro          | d) None of the above |
- 14)** The \_\_\_\_\_ state corresponds to a task which resides in memory but has not been made available to the multitasking kernel.
- |            |            |
|------------|------------|
| a) Waiting | b) Running |
| c) Ready   | d) Dormant |

Seat No.	
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Set 

R
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Embedded Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if wherever necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- Define embedded system. Explain major characteristics which differs embedded system from desktop computer.
- List down the differences between RISC and CISC architecture.
- Examine the content of all registers and memory locations after the execution of following instruction independently. (R7=0x00004000, R0=0x00000001, R1=0x00000002, R2=0x00000003, R3=0x00000004, R4=0x00000000)
  - LDMIA R7, {R0, R2-R4}
  - STMIA R7!, {R1, R3}
- Write an ARM ASM code to add two 64 bit numbers.
- Discuss the all GPIO registers of LPC2148 with one example each.

**Q.3 Solve any two of the following.** **12**

- Explain ARM programmer's model in detail. (Operating modes, Register model, Program status registers, Data types etc.)
- In RISC architecture an instruction requires four stages to execute: stage 1 (instruction fetch) requires 30 ns, stage 2 (instruction decode) = 9 ns, stage 3 (instruction execute) = 20 ns and stage 4 (store results) = 10 ns. An instruction must proceed through the stages in sequence. What is the minimum asynchronous time for any single instruction to complete?
- Write embedded C code to configure LPC2148 CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source. Discuss procedure for determining PLL setting and list required conditions.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- Discuss shared data problems and explain any one method to solve it.
- Define the context and context switching. What are the steps involved in  $\mu$ cos – II context switching?
- Elaborate the problem of priority inversion and mechanism to prevent the same with example.
- What is non-preemptive kernel? Elaborate in detail with example and proper diagram.
- List down the types of priority-based kernels. Discuss the preemptive kernel with example.

**Q.5 Solve any two of the followings.**

- a)** Elaborate with examples inter-task/process communication tool semaphore used in RTOS environment.
- b)** Define is a task? Sketch state transition diagram and discuss different task states in detail.
- c)** Create four RTOS tasks to blink LED's connected to LPC2148 port pins P0.4 through P0.7 at 1Hz, 1.5Hz, 2Hz and 2.5 Hz respectively.

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Embedded Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Don't forget to mention Question paper Set (P/Q/R/S) on top of page.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In LPC2148 \_\_\_\_\_ pin select register is used to configure port pins P1.16 to P1.31.
  - a) PINSEL2
  - b) IODIR2
  - c) PINSEL0
  - d) PINSEL1
- 2) In ARM7TDMI-S, S stands for \_\_\_\_\_.
  - a) System
  - b) Supervisory
  - c) Synthesizable
  - d) None of the above
- 3) Inter task communication can be done through \_\_\_\_\_.
  - a) Mailboxes
  - b) Message queues
  - c) Pipes
  - d) All of above
- 4) In \_\_\_\_\_ kernels, each task requires to do something to explicitly give up control of the CPU.
  - a) Non-preemptive
  - b) Preemptive
  - c) Micro
  - d) None of the above
- 5) The \_\_\_\_\_ state corresponds to a task which resides in memory but has not been made available to the multitasking kernel.
  - a) Waiting
  - b) Running
  - c) Ready
  - d) Dormant
- 6) A \_\_\_\_\_ function is a function that can be used by more than one task without fear of data corruption.
  - a) Non-reentrant
  - b) Reentrant
  - c) Swap
  - d) None of above
- 7) A semaphore is a protocol mechanism used to: \_\_\_\_\_.
  - a) Control access to a shared resource
  - b) Signal the occurrence of an event
  - c) Allow two tasks to synchronize their activities
  - d) All of above
- 8) For real time operating systems, interrupt latency should be \_\_\_\_\_.
  - a) minimal
  - b) maximum
  - c) zero
  - d) dependent on the scheduling



Seat No.	
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Set	S
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Embedded Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if wherever necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- Define embedded system. Explain major characteristics which differs embedded system from desktop computer.
- List down the differences between RISC and CISC architecture.
- Examine the content of all registers and memory locations after the execution of following instruction independently. (R7=0x00004000, R0=0x00000001, R1=0x00000002, R2=0x00000003, R3=0x00000004, R4=0x00000000)
  - LDMIA R7, {R0, R2-R4}
  - STMIA R7!, {R1, R3}
- Write an ARM ASM code to add two 64 bit numbers.
- Discuss the all GPIO registers of LPC2148 with one example each.

**Q.3 Solve any two of the following.** **12**

- Explain ARM programmer's model in detail. (Operating modes, Register model, Program status registers, Data types etc.)
- In RISC architecture an instruction requires four stages to execute: stage 1 (instruction fetch) requires 30 ns, stage 2 (instruction decode) = 9 ns, stage 3 (instruction execute) = 20 ns and stage 4 (store results) = 10 ns. An instruction must proceed through the stages in sequence. What is the minimum asynchronous time for any single instruction to complete?
- Write embedded C code to configure LPC2148 CPU clock for 60 MHz if the 10 MHz external crystal is used as a clock source. Discuss procedure for determining PLL setting and list required conditions.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- Discuss shared data problems and explain any one method to solve it.
- Define the context and context switching. What are the steps involved in  $\mu$ cos – II context switching?
- Elaborate the problem of priority inversion and mechanism to prevent the same with example.
- What is non-preemptive kernel? Elaborate in detail with example and proper diagram.
- List down the types of priority-based kernels. Discuss the preemptive kernel with example.

**Q.5 Solve any two of the followings.**

- a)** Elaborate with examples inter-task/process communication tool semaphore used in RTOS environment.
- b)** Define is a task? Sketch state transition diagram and discuss different task states in detail.
- c)** Create four RTOS tasks to blink LED's connected to LPC2148 port pins P0.4 through P0.7 at 1Hz, 1.5Hz, 2Hz and 2.5 Hz respectively.

**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronics System Design**

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.
- 2) Don't forget to mention the Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Assume suitable data wherever needed and mention it clearly.
- 4) Figures to the right indicate in full marks.

Marks: 14

14

- Page 1 of 12



- 9) PCBs should be fabricated with \_\_\_\_\_ layers.
- a) Odd number
  - b) even number of
  - c) any number of
  - d) None of these
- 10) In RS232 standards logic "0" is represented by \_\_\_\_\_.
- a) -3 to -25 V
  - b) 3 to 25 V
  - c) 0 to 0.8 V
  - d) 2 to 5 V
- 11) Which lines are utilized during the enable state of hardware flow control in DTE and DCE devices of RS232?
- a) CD & IR
  - b) DSR & DTR
  - c) RTS & CTS
  - d) None of the above
- 12) In DHT 11 \_\_\_\_\_ method is used for measuring the temperature.
- a) Resistive
  - b) Inductive
  - c) Capacitive
  - d) None of these
- 13) Thermocouple is a \_\_\_\_\_.
- a) Primary device
  - b) Secondary transducer
  - c) Tertiary transducer
  - d) None of the mentioned
- 14) An electronic device which converts physical quantity or energy from one form to another is called \_\_\_\_\_.
- a) Sensor
  - b) Transistor
  - c) Transducer
  - d) Thyristor

<b>Seat No.</b>	
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**Set****P**

**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronics System Design**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
1) Figures to the right indicates full marks.  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Solve any four** **16**
- a) Explain different stages in electronic product development.
  - b) Explain various goals of software design.
  - c) Explain different types of batteries.
  - d) Explain the working and interfacing of LDR.
  - e) Write a short note on humidity sensor DHT11. Show its interfacing.
- Q.3 Solve any Two** **12**
- a) Explain different constructs of regular program.
  - b) Develop temperature measurement system using LM35 and 8051.
  - c) Design a single cell Li-ion battery Charger with temperature compensation using LM317. Assume suitable battery specification.

**Section – II**

- Q.4 Solve any four** **16**
- a) Explain PCB design rules for digital circuits.
  - b) Explain layout rules in PCB design.
  - c) Write a short note on Smart Card Systems.
  - d) Explain RS485 serial protocol.
  - e) Compare memory mapped IO and IO mapped IO.
- Q.5 Solve any two** **12**
- a) Develop the system for RFID based attendance monitoring system.
  - b) In PCB design explain interconnection parameters Resistance and Capacitance.
  - c) Explain hardware and software components of temperature controller system.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 4 of 12

- 9) LM35 always requires an external calibration circuitry: \_\_\_\_\_.  
a) True                                      b) False
- 10) Why Vref is set of ADC0804 to 2.56 V if analog input is connected to the LM35?  
a) to set the step size of the sampled input  
b) to set the ground for the chip  
c) to provide supply to the chip  
d) all of the mentioned
- 11) Number of cells connected in series provide a \_\_\_\_\_.  
a) High current carrying capacity    b) Higher Voltage  
c) Higher power                          d) None of the above
- 12) Ni-Cd batteries are made of \_\_\_\_\_ chemical composition.  
a) Nickel and Calcium                 b) Nickel and Cadmium  
c) Nitrogen and Cadmium              d) None of the mentioned
- 13) In case of industrial or military products the prime requirement is \_\_\_\_\_.  
a) Best reliability                         b) Low cost  
c) Aesthetic design                       d) None of the above
- 14) A computer program is used to translate between lower-level representation of the computer program is called \_\_\_\_\_.  
a) Compiler                                 b) Assembler  
c) Cross-compiler                         d) Operating system

<b>Seat No.</b>	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronics System Design**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Solve any four** **16**
- a) Explain different stages in electronic product development.
  - b) Explain various goals of software design.
  - c) Explain different types of batteries.
  - d) Explain the working and interfacing of LDR.
  - e) Write a short note on humidity sensor DHT11. Show its interfacing.
- Q.3 Solve any Two** **12**
- a) Explain different constructs of regular program.
  - b) Develop temperature measurement system using LM35 and 8051.
  - c) Design a single cell Li-ion battery Charger with temperature compensation using LM317. Assume suitable battery specification.

**Section – II**

- Q.4 Solve any four** **16**
- a) Explain PCB design rules for digital circuits.
  - b) Explain layout rules in PCB design.
  - c) Write a short note on Smart Card Systems.
  - d) Explain RS485 serial protocol.
  - e) Compare memory mapped IO and IO mapped IO.
- Q.5 Solve any two** **12**
- a) Develop the system for RFID based attendance monitoring system.
  - b) In PCB design explain interconnection parameters Resistance and Capacitance.
  - c) Explain hardware and software components of temperature controller system.

Seat No.	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronics System Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which lines are utilized during the enable state of hardware flow control in DTE and DCE devices of RS232?
  - a) CD & IR
  - b) DSR & DTR
  - c) RTS & CTS
  - d) None of the above
- 2) In DHT 11 \_\_\_\_\_ method is used for measuring the temperature.
  - a) Resistive
  - b) Inductive
  - c) Capacitive
  - d) None of these
- 3) Thermocouple is a \_\_\_\_\_.
  - a) Primary device
  - b) Secondary transducer
  - c) Tertiary transducer
  - d) None of the mentioned
- 4) An electronic device which converts physical quantity or energy from one form to another is called \_\_\_\_\_.
  - a) Sensor
  - b) Transistor
  - c) Transducer
  - d) Thyristor
- 5) Transducer is used to convert a \_\_\_\_\_.
  - a) physical quantity into an electrical signal
  - b) electrical signal into a physical quantity
  - c) physical quantity into a mechanical quantity
  - d) physical quantity into a chemical quantity
- 6) LM35 always requires an external calibration circuitry: \_\_\_\_\_.
  - a) True
  - b) False
- 7) Why Vref is set of ADC0804 to 2.56 V if analog input is connected to the LM35?
  - a) to set the step size of the sampled input
  - b) to set the ground for the chip
  - c) to provide supply to the chip
  - d) all of the mentioned
- 8) Number of cells connected in series provide a \_\_\_\_\_.
  - a) High current carrying capacity
  - b) Higher Voltage
  - c) Higher power
  - d) None of the above

- 9) Ni-Cd batteries are made of \_\_\_\_\_ chemical composition.  
a) Nickel and Calcium                      b) Nickel and Cadmium  
c) Nitrogen and Cadmium                  d) None of the mentioned
- 10) In case of industrial or military products the prime requirement is \_\_\_\_\_.  
a) Best reliability                              b) Low cost  
c) Aesthetic design                          d) None of the above
- 11) A computer program is used to translate between lower-level representation of the computer program is called \_\_\_\_\_.  
a) Compiler                                      b) Assembler  
c) Cross-compiler                              d) Operating system
- 12) Laminate in a PCB is made of \_\_\_\_\_.  
a) insulating base                              b) conducting base  
c) semi-conductive base                      d) Ferrous material base
- 13) PCBs should be fabricated with \_\_\_\_\_ layers.  
a) Odd number                                  b) even number of  
c) any number of                                d) None of these
- 14) In RS232 standards logic "0" is represented by \_\_\_\_\_.  
a) -3 to -25 V                                  b) 3 to 25 V  
c) 0 to 0.8 V                                    d) 2 to 5 V

<b>Seat No.</b>	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronics System Design**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Solve any four** **16**
- a) Explain different stages in electronic product development.
  - b) Explain various goals of software design.
  - c) Explain different types of batteries.
  - d) Explain the working and interfacing of LDR.
  - e) Write a short note on humidity sensor DHT11. Show its interfacing.
- Q.3 Solve any Two** **12**
- a) Explain different constructs of regular program.
  - b) Develop temperature measurement system using LM35 and 8051.
  - c) Design a single cell Li-ion battery Charger with temperature compensation using LM317. Assume suitable battery specification.

**Section – II**

- Q.4 Solve any four** **16**
- a) Explain PCB design rules for digital circuits.
  - b) Explain layout rules in PCB design.
  - c) Write a short note on Smart Card Systems.
  - d) Explain RS485 serial protocol.
  - e) Compare memory mapped IO and IO mapped IO.
- Q.5 Solve any two** **12**
- a) Develop the system for RFID based attendance monitoring system.
  - b) In PCB design explain interconnection parameters Resistance and Capacitance.
  - c) Explain hardware and software components of temperature controller system.



Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.
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- 4) Figures to the right indicate in full marks.

Marks: 14

14

- Page 10 of 12

- 9) An electronic device which converts physical quantity or energy from one form to another is called \_\_\_\_\_.  
a) Sensor                                      b) Transistor  
c) Transducer                                d) Thyristor
- 10) Transducer is used to convert a \_\_\_\_\_.  
a) physical quantity into an electrical signal  
b) electrical signal into a physical quantity  
c) physical quantity into a mechanical quantity  
d) physical quantity into a chemical quantity
- 11) LM35 always requires an external calibration circuitry: \_\_\_\_\_.  
a) True    b) False
- 12) Why Vref is set of ADC0804 to 2.56 V if analog input is connected to the LM35?  
a) to set the step size of the sampled input  
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- 13) Number of cells connected in series provide a \_\_\_\_\_.  
a) High current carrying capacity      b) Higher Voltage  
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- 14) Ni-Cd batteries are made of \_\_\_\_\_ chemical composition.  
a) Nickel and Calcium                    b) Nickel and Cadmium  
c) Nitrogen and Cadmium                d) None of the mentioned

<b>Seat No.</b>	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronics System Design**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
1) Figures to the right indicates full marks.  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Solve any four** **16**
- a) Explain different stages in electronic product development.
  - b) Explain various goals of software design.
  - c) Explain different types of batteries.
  - d) Explain the working and interfacing of LDR.
  - e) Write a short note on humidity sensor DHT11. Show its interfacing.
- Q.3 Solve any Two** **12**
- a) Explain different constructs of regular program.
  - b) Develop temperature measurement system using LM35 and 8051.
  - c) Design a single cell Li-ion battery Charger with temperature compensation using LM317. Assume suitable battery specification.

**Section – II**

- Q.4 Solve any four** **16**
- a) Explain PCB design rules for digital circuits.
  - b) Explain layout rules in PCB design.
  - c) Write a short note on Smart Card Systems.
  - d) Explain RS485 serial protocol.
  - e) Compare memory mapped IO and IO mapped IO.
- Q.5 Solve any two** **12**
- a) Develop the system for RFID based attendance monitoring system.
  - b) In PCB design explain interconnection parameters Resistance and Capacitance.
  - c) Explain hardware and software components of temperature controller system.

Seat No.	
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Set P
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**VLSI Design**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the given option.**

**14**

- 1) A test bench is used \_\_\_\_\_.
  - a) Verify the functionality of a design
  - b) To generate primitives
  - c) To generate net list
  - d) None of above
- 2) Which of the following attribute returns the time elapsed since the previous transaction on S \_\_\_\_\_.
  - a) S'active
  - b) S'event
  - c) S'Last\_active
  - d) S'Last\_value
- 3) Which of the following is a valid signal declaration?
  - a) signal x : std\_logic = '2'
  - b) signal x <= 5;
  - c) signal x := 5;
  - d) signal x : std\_logic := '1';
- 4) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?
  - a) Generate
  - b) Attribute
  - c) Generics
  - d) Signals
- 5) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time?  
 X <= 4 after 5 ns ;
  - a) 10 ns;
  - b) 10ns + Δ
  - c) 5 ns
  - d) 5 ns + Δ
- 6) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is \_\_\_\_\_.
  - a) Transport
  - b) Inertial
  - c) Delta
  - d) None of these
- 7) Assuming the left operand as BIT - vector, "1101010" sll 2 is
  - a) "0101010"
  - b) "0101000"
  - c) "0101011"
  - d) None of these

- 8) A single pattern that may be interpreted as a result of all the applied tests in testing is \_\_\_\_\_.
  - a) MIC
  - b) PRBSG
  - c) SIC
  - d) Signature
- 9) No. of flip-flops /CLB in FPGA XC4000 is \_\_\_\_\_.
  - a) 4
  - b) 2
  - c) 6
  - d) 1
- 10) CMOS logic consists of \_\_\_\_\_.
  - a) pull up network
  - b) pull down network
  - c) Both a) and b)
  - d) None of above
- 11) Input Resistance of CMOS Inverter is \_\_\_\_\_.
  - a) Extremely LOW
  - b) Extremely High
  - c) Infinity
  - d) Zero
- 12) Which of the following method is used for testing the sequential circuit?
  - a) Random tests
  - b) Scan path technique
  - c) Path sensitizing technique
  - d) All of these
- 13) In a CMOS inverter with  $V_{tn} < V_{in} < V_{DD} / 2$ , the states of p-device and n-device are \_\_\_\_\_.
  - a) saturated, nonsaturated
  - b) linear, saturated
  - c) nonsaturated, cutoff
  - d) None of these
- 14) Input of synthesis process are \_\_\_\_\_.
  - a) RTL VHDL description
  - b) Circuit constraints and attributes design
  - c) Technology library
  - d) All of above

Seat No.	
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Set **P**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**VLSI Design**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Solve any four** **16**

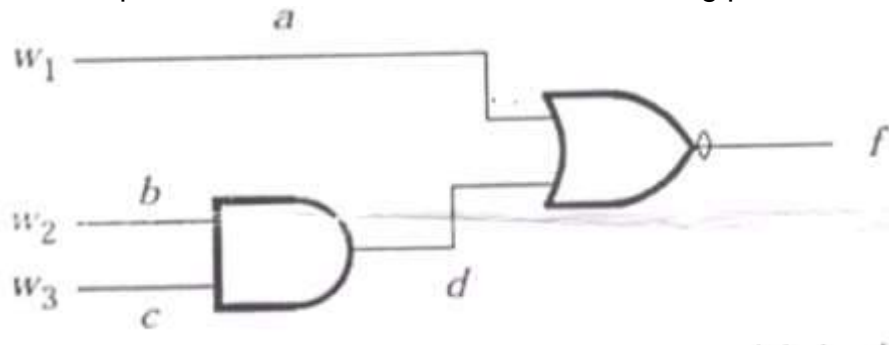
- a) Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?
- b) Explain the transport and inertial delays in VHDL
- c) Write VHDL code for 8:1 Multiplexer.
- d) If A="101", B="011" and C="010" what are the values of following statements.
  - i) A ror 2
  - ii) A & not B = "111110",
  - iii) A or B and C
  - iv) (A & B) or (B & C)
- e) Write VHDL code for D flip flop with asynchronous reset.

**Q.3 Solve any TWO** **12**

- a) What are the major differences between VHDL functions and VHDL Procedures? Write VHDL function for 4 bit addition.
- b) Write VHDL code for half adder. Also write the test bench for testing it.
- c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

**Section – II****Q.4 Solve any four** **16**

- a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.
- b) Explain place and route process of EDA tools.
- c) Explain the CMOS noise margin in detail.
- d) Obtain the complete test set for circuit shown below using path sensitizing.



- e) Draw and explain the schematic arrangement for testing sequential circuits.

**Q.5 Solve any TWO**

- a)** Draw and Explain Xilinx Spartan 4000 FPGA architecture.
- b)** Explain in detail simulation steps in RTL simulation.
- c)** Draw and Explain DC characteristics of CMOS Inverter.

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**VLSI Design**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the given option.**

**14**

- 1) A single pattern that may be interpreted as a result of all the applied tests in testing is \_\_\_\_\_.
 

a) MIC	b) PRBSG
c) SIC	d) Signature
- 2) No. of flip-flops /CLB in FPGA XC4000 is \_\_\_\_\_.
 

a) 4	b) 2
c) 6	d) 1
- 3) CMOS logic consists of \_\_\_\_\_.
 

a) pull up network	b) pull down network
c) Both a) and b)	d) None of above
- 4) Input Resistance of CMOS Inverter is \_\_\_\_\_.
 

a) Extremely LOW	b) Extremely High
c) Infinity	d) Zero
- 5) Which of the following method is used for testing the sequential circuit?
 

a) Random tests	b) Scan path technique
c) Path sensitizing technique	d) All of these
- 6) In a CMOS inverter with  $V_{tn} < V_{in} < V_{DD} / 2$ , the states of p-device and n-device are \_\_\_\_\_.
 

a) saturated, nonsaturated
b) linear, saturated
c) nonsaturated, cutoff
d) None of these
- 7) Input of synthesis process are \_\_\_\_\_.
 

a) RTL VHDL description
b) Circuit constraints and attributes design
c) Technology library
d) All of above



- 8) A test bench is used \_\_\_\_\_  
a) Verify the functionality of a design  
b) To generate primitives  
c) To generate net list  
d) None of above
- 9) Which of the following attribute returns the time elapsed since the previous transaction on S \_\_\_\_\_.  
a) S'active  
b) S'event  
c) S'Last\_active  
d) S'Last\_value
- 10) Which of the following is a valid signal declaration?  
a) signal x : std\_logic = '2'  
b) signal x <= 5;  
c) signal x := 5;  
d) signal x : std\_logic := '1';
- 11) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?  
a) Generate  
b) Attribute  
c) Generics  
d) Signals
- 12) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time?  
X <= 4 after 5 ns ;  
a) 10 ns;  
b) 10ns +  $\Delta$   
c) 5 ns  
d) 5 ns +  $\Delta$
- 13) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is \_\_\_\_\_.  
a) Transport  
b) Inertial  
c) Delta  
d) None of these
- 14) Assuming the left operand as BIT - vector, "1101010" sll 2 is  
a) "0101010"  
b) "0101000"  
c) "0101011"  
d) None of these

Seat No.	
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Set **Q**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**VLSI Design**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Solve any four****16**

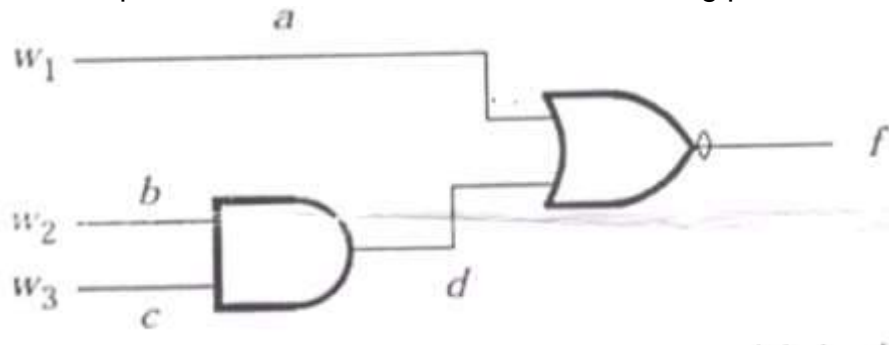
- Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?
- Explain the transport and inertial delays in VHDL
- Write VHDL code for 8:1 Multiplexer.
- If A="101", B="011" and C="010" what are the values of following statements.
  - A xor 2
  - A & not B = "111110",
  - A or B and C
  - (A & B) or (B & C)
- Write VHDL code for D flip flop with asynchronous reset.

**Q.3 Solve any TWO****12**

- What are the major differences between VHDL functions and VHDL Procedures? Write VHDL function for 4 bit addition.
- Write VHDL code for half adder. Also write the test bench for testing it.
- Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

**Section – II****Q.4 Solve any four****16**

- Explain the architecture of macrocell in Xilinx 9500 series CPLD.
- Explain place and route process of EDA tools.
- Explain the CMOS noise margin in detail.
- Obtain the complete test set for circuit shown below using path sensitizing.



- Draw and explain the schematic arrangement for testing sequential circuits.

**Q.5 Solve any TWO**

- a)** Draw and Explain Xilinx Spartan 4000 FPGA architecture.
- b)** Explain in detail simulation steps in RTL simulation.
- c)** Draw and Explain DC characteristics of CMOS Inverter.

<b>Seat No.</b>	
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Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks: 14

14

- Page 9 of 16

- 8) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?
- a) Generate
  - b) Attribute
  - c) Generics
  - d) Signals
- 9) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time?  
 $X \leq 4$  after 5 ns ;
- a) 10 ns;
  - b) 10ns +  $\Delta$
  - c) 5 ns
  - d) 5 ns +  $\Delta$
- 10) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is \_\_\_\_.
- a) Transport
  - b) Inertial
  - c) Delta
  - d) None of these
- 11) Assuming the left operand as BIT - vector, "1101010" sll 2 is
- a) "0101010"
  - b) "0101000"
  - c) "0101011"
  - d) None of these
- 12) A single pattern that may be interpreted as a result of all the applied tests in testing is \_\_\_\_
- a) MIC
  - b) PRBSG
  - c) SIC
  - d) Signature
- 13) No. of flip-flops /CLB in FPGA XC4000 is \_\_\_\_
- a) 4
  - b) 2
  - c) 6
  - d) 1
- 14) CMOS logic consists of \_\_\_\_.
- a) pull up network
  - b) pull down network
  - c) Both a) and b)
  - d) None of above

Seat No.	
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Set **R**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**VLSI Design**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Solve any four** **16**

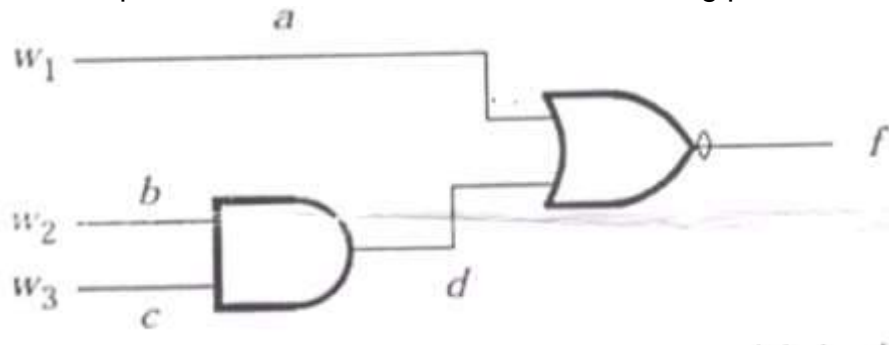
- a) Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?
- b) Explain the transport and inertial delays in VHDL
- c) Write VHDL code for 8:1 Multiplexer.
- d) If A="101", B="011" and C="010" what are the values of following statements.
  - i) A ror 2
  - ii) A & not B = "111110",
  - iii) A or B and C
  - iv) (A & B) or (B & C)
- e) Write VHDL code for D flip flop with asynchronous reset.

**Q.3 Solve any TWO** **12**

- a) What are the major differences between VHDL functions and VHDL Procedures? Write VHDL function for 4 bit addition.
- b) Write VHDL code for half adder. Also write the test bench for testing it.
- c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

**Section – II****Q.4 Solve any four** **16**

- a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.
- b) Explain place and route process of EDA tools.
- c) Explain the CMOS noise margin in detail.
- d) Obtain the complete test set for circuit shown below using path sensitizing.



- e) Draw and explain the schematic arrangement for testing sequential circuits.

**Q.5 Solve any TWO**

- a)** Draw and Explain Xilinx Spartan 4000 FPGA architecture.
- b)** Explain in detail simulation steps in RTL simulation.
- c)** Draw and Explain DC characteristics of CMOS Inverter.

**Seat  
No.**

Set	S
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Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks: 14

## 14

- Page 13 of 16



- 9) Input of synthesis process are \_\_\_\_\_.  
a) RTL VHDL description  
b) Circuit constraints and attributes design  
c) Technology library  
d) All of above
- 10) A test bench is used \_\_\_\_\_.  
a) Verify the functionality of a design  
b) To generate primitives  
c) To generate net list  
d) None of above
- 11) Which of the following attribute returns the time elapsed since the previous transaction on S \_\_\_\_\_.  
a) S'active  
b) S'event  
c) S'Last\_active  
d) S'Last\_value
- 12) Which of the following is a valid signal declaration?  
a) signal x : std\_logic = '2'  
b) signal x <= 5;  
c) signal x := 5;  
d) signal x : std\_logic := '1';
- 13) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?  
a) Generate  
b) Attribute  
c) Generics  
d) Signals
- 14) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time?  
X <= 4 after 5 ns ;  
a) 10 ns;  
b) 10ns + Δ  
c) 5 ns  
d) 5 ns + Δ

Seat No.	
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Set **S**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**VLSI Design**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Solve any four****16**

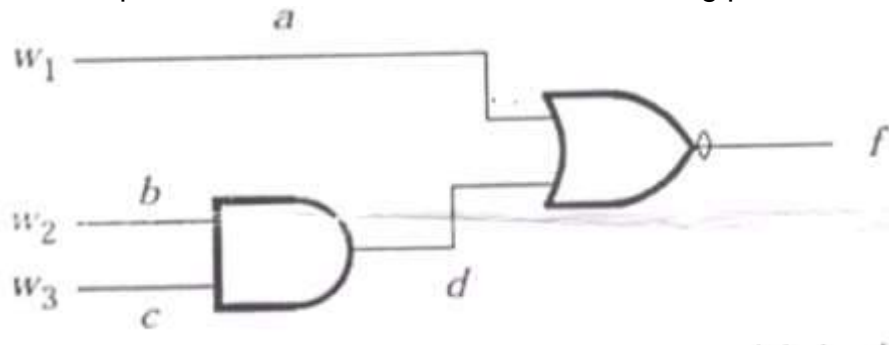
- Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?
- Explain the transport and inertial delays in VHDL
- Write VHDL code for 8:1 Multiplexer.
- If A="101", B="011" and C="010" what are the values of following statements.
  - A xor 2
  - A & not B = "111110",
  - A or B and C
  - (A & B) or (B & C)
- Write VHDL code for D flip flop with asynchronous reset.

**Q.3 Solve any TWO****12**

- What are the major differences between VHDL functions and VHDL Procedures? Write VHDL function for 4 bit addition.
- Write VHDL code for half adder. Also write the test bench for testing it.
- Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

**Section – II****Q.4 Solve any four****16**

- Explain the architecture of macrocell in Xilinx 9500 series CPLD.
- Explain place and route process of EDA tools.
- Explain the CMOS noise margin in detail.
- Obtain the complete test set for circuit shown below using path sensitizing.



- Draw and explain the schematic arrangement for testing sequential circuits.

**Q.5 Solve any TWO**

- a)** Draw and Explain Xilinx Spartan 4000 FPGA architecture.
- b)** Explain in detail simulation steps in RTL simulation.
- c)** Draw and Explain DC characteristics of CMOS Inverter.

Seat No.	
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Set P
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Operating Systems**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A process can be \_\_\_\_\_.  
 a) single threaded  
 b) multithreaded  
 c) both single threaded and multithreaded  
 d) none of the mentioned
- 2) The model in which the one kernel thread is mapped to many user-level threads is called:  
 a) Many to One model  
 b) One to Many model  
 c) Many to Many model  
 d) One to One model
- 3) The long-term scheduler \_\_\_\_\_.  
 a) selects processes which have to be brought into the ready queue  
 b) selects processes which have to be executed next and allocates CPU  
 c) selects processes which have to remove from memory by swapping  
 d) None of the mentioned
- 4) Round robin scheduling falls under the category of \_\_\_\_\_.  
 a) Non-preemptive scheduling  
 b) Preemptive scheduling  
 c) All of the mentioned  
 d) None of the mentioned
- 5) Which of the following scheduling algorithms gives minimum average waiting time?  
 a) FCFS  
 b) SJF  
 c) Round robin  
 d) priority
- 6) From the time of submission of a process to the time of completion, The interval is termed as \_\_\_\_\_.  
 a) Waiting time  
 b) Turnaround time  
 c) Response time  
 d) Throughput
- 7) Which of the following system call is used for opening or creating a file?  
 a) Red  
 b) White  
 c) Open  
 d) Close

- 8) Which of the following condition is required for a deadlock to be possible?
- a) mutual exclusion
  - b) a process may hold allocated resources while awaiting assignment of other resources
  - c) no resource can be forcibly removed from a process holding it
  - d) all the mentioned
- 9) Which one of the following is the deadlock avoidance algorithm?
- a) Banker's algorithm
  - b) Round-robin algorithm
  - c) Peterson's algorithm
  - d) Karn's algorithm
- 10) Thrashing\_\_\_\_\_ the CPU utilization.
- a) increases
  - b) keeps constant
  - c) decreases
  - d) none of the mentioned
- 11) LRU page - replacement algorithm associates with each page the\_\_\_\_\_.
- a) time it was brought into memory
  - b) the time of that page's last use
  - c) page after and before it
  - d) all of the mentioned
- 12) \_\_\_\_\_ page replacement algorithm suffers from Belady's Anomaly.
- a) Optimal
  - b) LRU
  - c) FCFS
  - d) None of the mentioned
- 13) Which one of the following is the address generated by CPU?
- a) physical address
  - b) absolute address
  - c) logical address
  - d) none of the mentioned
- 14) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
- a) fragmentation
  - b) paging
  - c) mapping
  - d) none of the mentioned

Seat No.	
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Set	P
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Operating Systems**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section-I**

**Q.2 Answer any four.** **16**

- a) Define process and explain different components of process.
- b) List different types of operating systems. Describe any two types of operating systems in detail.
- c) What is the necessity of system call? List different systems calls used in operating systems. Explain any two systems calls.
- d) Why inter-process communication is required? Explain shared memory and message passing mechanism of inter process communication.
- e) Describe various activities involved in process management. Specify different components of process control block.

**Q.3 Solve any two.** **12**

- a) List different multi-threading models and describe any two in detail. Compare between process and thread.
- b) What is race condition? Explain use of turn variable and semaphore to ensure mutual exclusion to avoid race condition.
- c) Following table shows processes along with their arrival and burst time

Process	Burst time (ms)	Arrival time (ms)
P1	10	0
P2	8	0
P3	6	1
P4	3	2
P5	4	1

Calculate average TAT and average WT for shortest job first (SJF) and shortest remaining time first (SRTF) scheduling algorithm.

**Section – II**

**Q.4 Attempt any four.** **16**

- a) What is deadlock? Describe necessary conditions to create deadlock.
- b) What are logical and physical addresses in operating system? Compare between logical and physical address.

- c) The following table shows allocated and required resources for processes execution.

<b>Process</b>	<b>Resource Allocated</b>		<b>Resource requested</b>	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
P1	1	0	0	0
P2	0	1	0	0
P3	0	0	1	1
P4	0	0	1	0

Draw resource allocation graph. Is deadlock available in RAG? Justify your answer

- d) Apply Banker's algorithm to find safe sequence of process execution. Assume current available resources as A= 2, B=3, C=0

<b>Process</b>	<b>Resource allocated</b>			<b>Maximum resources required</b>		
	<b>A</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>
P0	0	1	0	7	5	3
P1	3	0	2	3	2	2
P2	3	0	2	2	0	2
P3	2	1	1	9	2	2
P4	0	0	2	4	3	3

- e) What is free space management in operating system? Describe different methods of free-space management.

**Q.5 Attempt any two.**

**12**

- a) Describe contiguous and non-contiguous memory allocation in detail. What are internal and external fragmentation issues related to memory allocation.
- b) In case of optimal page replacement algorithm following is page reference String- Reference String = {7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1} and number of frames in RAM = 3. Find page faults, page hits, page fault ratio and page hit ratio.
- c) What are the drawbacks of paging? Describe segmentation in operating system. How segmentation overcome paging drawbacks?

Seat No.	
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Set Q
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Operating Systems**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which of the following condition is required for a deadlock to be possible?
  - a) mutual exclusion
  - b) a process may hold allocated resources while awaiting assignment of other resources
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- 2) Which one of the following is the deadlock avoidance algorithm?
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  - c) page after and before it
  - d) all of the mentioned
- 5) \_\_\_\_\_ page replacement algorithm suffers from Belady's Anomaly.
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- 6) Which one of the following is the address generated by CPU?
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- 7) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
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  - c) mapping
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- 8) A process can be \_\_\_\_\_.  
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- 11) Round robin scheduling falls under the category of \_\_\_\_\_.  
a) Non-preemptive scheduling  
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- 12) Which of the following scheduling algorithms gives minimum average waiting time?  
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- 13) From the time of submission of a process to the time of completion, The interval is termed as \_\_\_\_\_.  
a) Waiting time  
b) Turnaround time  
c) Response time  
d) Throughput
- 14) Which of the following system call is used for opening or creating a file?  
a) Red  
b) White  
c) Open  
d) Close

Seat No.	
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Set Q
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Operating Systems**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section-I**

**Q.2 Answer any four.** **16**

- Define process and explain different components of process.
- List different types of operating systems. Describe any two types of operating systems in detail.
- What is the necessity of system call? List different systems calls used in operating systems. Explain any two systems calls.
- Why inter-process communication is required? Explain shared memory and message passing mechanism of inter process communication.
- Describe various activities involved in process management. Specify different components of process control block.

**Q.3 Solve any two.** **12**

- List different multi-threading models and describe any two in detail. Compare between process and thread.
- What is race condition? Explain use of turn variable and semaphore to ensure mutual exclusion to avoid race condition.
- Following table shows processes along with their arrival and burst time

Process	Burst time (ms)	Arrival time (ms)
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P2	8	0
P3	6	1
P4	3	2
P5	4	1

Calculate average TAT and average WT for shortest job first (SJF) and shortest remaining time first (SRTF) scheduling algorithm.

**Section – II**

**Q.4 Attempt any four.** **16**

- What is deadlock? Describe necessary conditions to create deadlock.
- What are logical and physical addresses in operating system? Compare between logical and physical address.

- c) The following table shows allocated and required resources for processes execution.

<b>Process</b>	<b>Resource Allocated</b>		<b>Resource requested</b>	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
P1	1	0	0	0
P2	0	1	0	0
P3	0	0	1	1
P4	0	0	1	0

Draw resource allocation graph. Is deadlock available in RAG? Justify your answer

- d) Apply Banker's algorithm to find safe sequence of process execution. Assume current available resources as A= 2, B=3, C=0

<b>Process</b>	<b>Resource allocated</b>			<b>Maximum resources required</b>		
	<b>A</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>
P0	0	1	0	7	5	3
P1	3	0	2	3	2	2
P2	3	0	2	2	0	2
P3	2	1	1	9	2	2
P4	0	0	2	4	3	3

- e) What is free space management in operating system? Describe different methods of free-space management.

**Q.5 Attempt any two.**

**12**

- a) Describe contiguous and non-contiguous memory allocation in detail. What are internal and external fragmentation issues related to memory allocation.
- b) In case of optimal page replacement algorithm following is page reference String- Reference String = {7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1} and number of frames in RAM = 3. Find page faults, page hits, page fault ratio and page hit ratio.
- c) What are the drawbacks of paging? Describe segmentation in operating system. How segmentation overcome paging drawbacks?

Seat No.	
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Set	R
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Operating Systems**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) LRU page - replacement algorithm associates with each page the \_\_\_\_\_.  
 a) time it was brought into memory  
 b) the time of that page's last use  
 c) page after and before it  
 d) all of the mentioned
- 2) \_\_\_\_\_ page replacement algorithm suffers from Belady's Anomaly.  
 a) Optimal  
 b) LRU  
 c) FCFS  
 d) None of the mentioned
- 3) Which one of the following is the address generated by CPU?  
 a) physical address  
 b) absolute address  
 c) logical address  
 d) none of the mentioned
- 4) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?  
 a) fragmentation  
 b) paging  
 c) mapping  
 d) none of the mentioned
- 5) A process can be \_\_\_\_\_.  
 a) single threaded  
 b) multithreaded  
 c) both single threaded and multithreaded  
 d) none of the mentioned
- 6) The model in which the one kernel thread is mapped to many user-level threads is called:  
 a) Many to One model  
 b) One to Many model  
 c) Many to Many model  
 d) One to One model
- 7) The long-term scheduler \_\_\_\_\_.  
 a) selects processes which have to be brought into the ready queue  
 b) selects processes which have to be executed next and allocates CPU  
 c) selects processes which have to remove from memory by swapping  
 d) None of the mentioned

- 8) Round robin scheduling falls under the category of \_\_\_\_\_.  
a) Non-preemptive scheduling      b) Preemptive scheduling  
c) All of the mentioned            d) None of the mentioned
- 9) Which of the following scheduling algorithms gives minimum average waiting time?  
a) FCFS                                      b) SJF  
c) Round robin                              d) priority
- 10) From the time of submission of a process to the time of completion, The interval is termed as \_\_\_\_\_.  
a) Waiting time                              b) Turnaround time  
c) Response time                              d) Throughput
- 11) Which of the following system call is used for opening or creating a file?  
a) Red    b) White  
c) Open    d) Close
- 12) Which of the following condition is required for a deadlock to be possible?  
a) mutual exclusion  
b) a process may hold allocated resources while awaiting assignment of other resources  
c) no resource can be forcibly removed from a process holding it  
d) all the mentioned
- 13) Which one of the following is the deadlock avoidance algorithm?  
a) Banker's algorithm                      b) Round-robin algorithm  
c) Peterson's algorithm                      d) Karn's algorithm
- 14) Thrashing\_\_\_\_\_ the CPU utilization.  
a) increases                                      b) keeps constant  
c) decreases                                      d) none of the mentioned

Seat No.	
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Set R
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Operating Systems**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section-I**

**Q.2 Answer any four.** **16**

- Define process and explain different components of process.
- List different types of operating systems. Describe any two types of operating systems in detail.
- What is the necessity of system call? List different systems calls used in operating systems. Explain any two systems calls.
- Why inter-process communication is required? Explain shared memory and message passing mechanism of inter process communication.
- Describe various activities involved in process management. Specify different components of process control block.

**Q.3 Solve any two.** **12**

- List different multi-threading models and describe any two in detail. Compare between process and thread.
- What is race condition? Explain use of turn variable and semaphore to ensure mutual exclusion to avoid race condition.
- Following table shows processes along with their arrival and burst time

Process	Burst time (ms)	Arrival time (ms)
P1	10	0
P2	8	0
P3	6	1
P4	3	2
P5	4	1

Calculate average TAT and average WT for shortest job first (SJF) and shortest remaining time first (SRTF) scheduling algorithm.

**Section – II**

**Q.4 Attempt any four.** **16**

- What is deadlock? Describe necessary conditions to create deadlock.
- What are logical and physical addresses in operating system? Compare between logical and physical address.

- c) The following table shows allocated and required resources for processes execution.

<b>Process</b>	<b>Resource Allocated</b>		<b>Resource requested</b>	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
P1	1	0	0	0
P2	0	1	0	0
P3	0	0	1	1
P4	0	0	1	0

Draw resource allocation graph. Is deadlock available in RAG? Justify your answer

- d) Apply Banker's algorithm to find safe sequence of process execution. Assume current available resources as A= 2, B=3, C=0

<b>Process</b>	<b>Resource allocated</b>			<b>Maximum resources required</b>		
	<b>A</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>
P0	0	1	0	7	5	3
P1	3	0	2	3	2	2
P2	3	0	2	2	0	2
P3	2	1	1	9	2	2
P4	0	0	2	4	3	3

- e) What is free space management in operating system? Describe different methods of free-space management.

**Q.5 Attempt any two.**

**12**

- a) Describe contiguous and non-contiguous memory allocation in detail. What are internal and external fragmentation issues related to memory allocation.
- b) In case of optimal page replacement algorithm following is page reference String- Reference String = {7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1} and number of frames in RAM = 3. Find page faults, page hits, page fault ratio and page hit ratio.
- c) What are the drawbacks of paging? Describe segmentation in operating system. How segmentation overcome paging drawbacks?

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99	99
100	100

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

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## Marks: 14

14

- Page 13 of 16



- 9) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
- a) fragmentation
  - b) paging
  - c) mapping
  - d) none of the mentioned
- 10) A process can be \_\_\_\_.
- a) single threaded
  - b) multithreaded
  - c) both single threaded and multithreaded
  - d) none of the mentioned
- 11) The model in which the one kernel thread is mapped to many user-level threads is called:
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  - c) Many to Many model
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- 12) The long-term scheduler \_\_\_\_.
- a) selects processes which have to be brought into the ready queue
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  - c) selects processes which have to be removed from memory by swapping
  - d) None of the mentioned
- 13) Round robin scheduling falls under the category of \_\_\_\_.
- a) Non-preemptive scheduling
  - b) Preemptive scheduling
  - c) All of the mentioned
  - d) None of the mentioned
- 14) Which of the following scheduling algorithms gives minimum average waiting time?
- a) FCFS
  - b) SJF
  - c) Round robin
  - d) priority

Seat No.	
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Set	S
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Operating Systems**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section-I**

**Q.2 Answer any four.** **16**

- Define process and explain different components of process.
- List different types of operating systems. Describe any two types of operating systems in detail.
- What is the necessity of system call? List different systems calls used in operating systems. Explain any two systems calls.
- Why inter-process communication is required? Explain shared memory and message passing mechanism of inter process communication.
- Describe various activities involved in process management. Specify different components of process control block.

**Q.3 Solve any two.** **12**

- List different multi-threading models and describe any two in detail. Compare between process and thread.
- What is race condition? Explain use of turn variable and semaphore to ensure mutual exclusion to avoid race condition.
- Following table shows processes along with their arrival and burst time

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P2	8	0
P3	6	1
P4	3	2
P5	4	1

Calculate average TAT and average WT for shortest job first (SJF) and shortest remaining time first (SRTF) scheduling algorithm.

**Section – II**

**Q.4 Attempt any four.** **16**

- What is deadlock? Describe necessary conditions to create deadlock.
- What are logical and physical addresses in operating system? Compare between logical and physical address.

- c) The following table shows allocated and required resources for processes execution.

<b>Process</b>	<b>Resource Allocated</b>		<b>Resource requested</b>	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
P1	1	0	0	0
P2	0	1	0	0
P3	0	0	1	1
P4	0	0	1	0

Draw resource allocation graph. Is deadlock available in RAG? Justify your answer

- d) Apply Banker's algorithm to find safe sequence of process execution. Assume current available resources as A= 2, B=3, C=0

<b>Process</b>	<b>Resource allocated</b>			<b>Maximum resources required</b>		
	<b>A</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>
P0	0	1	0	7	5	3
P1	3	0	2	3	2	2
P2	3	0	2	2	0	2
P3	2	1	1	9	2	2
P4	0	0	2	4	3	3

- e) What is free space management in operating system? Describe different methods of free-space management.

#### Q.5 Attempt any two.

12

- a) Describe contiguous and non-contiguous memory allocation in detail. What are internal and external fragmentation issues related to memory allocation.
- b) In case of optimal page replacement algorithm following is page reference String- Reference String = {7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1} and number of frames in RAM = 3. Find page faults, page hits, page fault ratio and page hit ratio.
- c) What are the drawbacks of paging? Describe segmentation in operating system. How segmentation overcome paging drawbacks?

Seat No.	
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Index grading may be achieved through the \_\_\_\_\_ of mobile ions across the core cladding interface within molten glass.
  - a) Diffusion
  - b) Doping
  - c) Separation
  - d) Combination
- 2) The graded index profile which produce the best results for multimode optical propagation have refractive index profile
  - a) Circular
  - b) Rectangular
  - c) Triangular
  - d) Parabolic
- 3) Attenuation per Km expressed in
  - a) Ampere
  - b) Decibel per Km
  - c) Watt
  - d) None of these
- 4) The spectral linewidth of an LED operating at room temperature is the 0.8 to 0.9  $\mu\text{m}$  wavelength band is usually between \_\_\_\_\_ at the half maximum intensity points
  - a) 10 to 15 mm
  - b) 20 to 30 mm
  - c) 25 to 40 nm
  - d) 10 to 15 nm
- 5) The internal quantum efficiency of LED decreases with \_\_\_\_\_.
  - a) Increase in temp
  - b) Decrease in temp
  - c) increase in pressure
  - d) Both a and c
- 6) Injection laser will generally supply \_\_\_\_\_ of optical output power.
  - a) Megawatts
  - b) Kilowatts
  - c) Milliwatts
  - d) None
- 7) LASER works on \_\_\_\_\_ principle.
  - a) Absorption
  - b) Stimulated emission
  - c) Spontaneous emission
  - d) Both b & c
- 8) SLD offers \_\_\_\_\_ spectral line width.
  - a) Narrow
  - b) Broad
  - c) Constant
  - d) Non liner

- 9) \_\_\_\_\_ is a multi-functional element of optical network.
  - a) HOP
  - b) Optical Mode
  - c) Wavelength
  - d) None of these
- 10) In an optical network, increase in the number of lasers \_\_\_\_\_ the bit rate.
  - a) Stabilizes
  - b) Decreases
  - c) Increases
  - d) None of these
- 11) \_\_\_\_\_ is a multiplexing technique used to combine optical signals.
  - a) FDM
  - b) WDM
  - c) TDM
  - d) None of these
- 12) The basic performance of WDM system is determine by \_\_\_\_\_.
  - a) Noise added in channel
  - b) Transmission loss
  - c) Insertion loss
  - d) All of these
- 13) In optical cable design the strain on the fiber in the cable does not exceed \_\_\_\_\_ %.
  - a) 5
  - b) 0.8
  - c) 2.2
  - d) 0.2
- 14) OTDM stand for \_\_\_\_\_ Time \_\_\_\_\_ Multiplexing
  - a) Orthogonal, Duplex
  - b) Optical, Duplex
  - c) Orthogonal, Division
  - d) Optical, Division

Seat No.	
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Set	P
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- An optical fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59. Determine
  - The acceptance angle for the fiber in water which has a refractive index of 1.33
  - The critical angle at the core-cladding interface.
- Derive the expression for Numerical Aperture
- Briefly write about non-linear scattering losses observed in fiber optics.
- Explain the principle operation / concept of double heterojunction LED.
- Write Comparison between step index fiber and graded index fiber

**Q.3 Answer the following (Any Two) 12**

- A silica optical fiber with core diameter large enough to be considered ray theory analysis has a core refractive index of 1.50 and a cladding refractive index of 1.47. Determine
  - The critical angle at the core-cladding interface
  - The NA for the fiber
  - The acceptance angle in air for the fiber.
- What are splices? Explain techniques for splicing.
- With energy state diagram explain working of laser

**Section – II**

**Q.4 Attempt any Four. 16**

- A GaAs has a bandgap energy of 1.43 eV at 300 K. Determine the wavelength above which an intrinsic photodetector fabricated from this material will cease to operate.
- Write a short note on WDM.
- Write a short note on semiconductor optical amplifiers.
- What is FDDI? Explain in brief.
- Explain the following terms: Quantum Efficiency & Responsivity.

**Q.5 Attempt any two. 12**

- The radiative and nonradiative recombination lifetimes of the minority carriers in the active region of a double-heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination lifetime and the power internally generated within the device when the peak emission wavelength is  $0.87 \mu\text{m}$  at a drive current of 40 mA.
- Explain in details types of Optical Amplifiers.
- Draw the equivalent circuit diagram of low impedance front end receiver amplifier and obtain the S/N ratio.

Seat No.	
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Set Q
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) SLD offers \_\_\_\_\_ spectral line width.
  - a) Narrow
  - b) Broad
  - c) Constant
  - d) Non liner
- 2) \_\_\_\_\_ is a multi-functional element of optical network.
  - a) HOP
  - b) Optical Mode
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  - d) None of these
- 3) In an optical network, increase in the number of lasers \_\_\_\_\_ the bit rate.
  - a) Stabilizes
  - b) Decreases
  - c) Increases
  - d) None of these
- 4) \_\_\_\_\_ is a multiplexing technique used to combine optical signals.
  - a) FDM
  - b) WDM
  - c) TDM
  - d) None of these
- 5) The basic performance of WDM system is determine by \_\_\_\_\_.
  - a) Noise added in channel
  - b) Transmission loss
  - c) Insertion loss
  - d) All of these
- 6) In optical cable design the strain on the fiber in the cable does not exceed \_\_\_\_\_ %.
  - a) 5
  - b) 0.8
  - c) 2.2
  - d) 0.2
- 7) OTDM stand for \_\_\_\_\_ Time \_\_\_\_\_ Multiplexing
  - a) Orthogonal, Duplex
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  - c) Orthogonal, Division
  - d) Optical, Division
- 8) Index grading may be achieved through the \_\_\_\_\_ of mobile ions across the core cladding interface within molten glass.
  - a) Diffusion
  - b) Doping
  - c) Separation
  - d) Combination
- 9) The graded index profile which produce the best results for multimode optical propagation have refractive index profile
  - a) Circular
  - b) Rectangular
  - c) Triangular
  - d) Parabolic

- 10) Attenuation per Km expressed in
  - a) Ampere
  - b) Decibel per Km
  - c) Watt
  - d) None of these
- 11) The spectral linewidth of an LED operating at room temperature is the 0.8 to 0.9  $\mu\text{m}$  wavelength band is usually between \_\_\_\_\_ at the half maximum intensity points
  - a) 10 to 15 mm
  - b) 20 to 30 mm
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- 12) The internal quantum efficiency of LED decreases with \_\_\_\_\_.
  - a) Increase in temp
  - b) Decrease in temp
  - c) increase in pressure
  - d) Both a and c
- 13) Injection laser will generally supply \_\_\_\_\_ of optical output power.
  - a) Megawatts
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  - c) Milliwatts
  - d) None
- 14) LASER works on \_\_\_\_\_ principle.
  - a) Absorption
  - b) Stimulated emission
  - c) Spontaneous emission
  - d) Both b & c



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Set Q
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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**Section – I**

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**Section – II**

**Q.4 Attempt any Four. 16**

- a) A GaAs has a bandgap energy of 1.43 eV at 300 K. Determine the wavelength above which an intrinsic photodetector fabricated from this material will cease to operate.
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- d) What is FDDI? Explain in brief.
- e) Explain the following terms: Quantum Efficiency & Responsivity.

**Q.5 Attempt any two. 12**

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- b) Explain in details types of Optical Amplifiers.
- c) Draw the equivalent circuit diagram of low impedance front end receiver amplifier and obtain the S/N ratio.

Seat No.	
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Set R
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**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ is a multiplexing technique used to combine optical signals.
  - a) FDM
  - b) WDM
  - c) TDM
  - d) None of these
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- 3) In optical cable design the strain on the fiber in the cable does not exceed \_\_\_\_\_ %.
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- 9) The internal quantum efficiency of LED decreases with \_\_\_\_\_.  
a) Increase in temp                      b) Decrease in temp  
c) increase in pressure                  d) Both a and c
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c) Milliwatts                                d) None
- 11) LASER works on \_\_\_\_\_ principle.  
a) Absorption                                b) Stimulated emission  
c) Spontaneous emission                d) Both b & c
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a) Narrow                                    b) Broad  
c) Constant                                  d) Non liner
- 13) \_\_\_\_\_ is a multi-functional element of optical network.  
a) HOP                                        b) Optical Mode  
c) Wavelength                              d) None of these
- 14) In an optical network, increase in the number of lasers \_\_\_\_\_ the bit rate.  
a) Stabilizes                                  b) Decreases  
c) Increases                                  d) None of these

Seat No.	
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Set **R**

**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- An optical fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59. Determine
  - The acceptance angle for the fiber in water which has a refractive index of 1.33
  - The critical angle at the core-cladding interface.
- Derive the expression for Numerical Aperture
- Briefly write about non-linear scattering losses observed in fiber optics.
- Explain the principle operation / concept of double heterojunction LED.
- Write Comparison between step index fiber and graded index fiber

**Q.3 Answer the following (Any Two) 12**

- A silica optical fiber with core diameter large enough to be considered ray theory analysis has a core refractive index of 1.50 and a cladding refractive index of 1.47. Determine
  - The critical angle at the core-cladding interface
  - The NA for the fiber
  - The acceptance angle in air for the fiber.
- What are splices? Explain techniques for splicing.
- With energy state diagram explain working of laser

**Section – II**

**Q.4 Attempt any Four. 16**

- A GaAs has a bandgap energy of 1.43 eV at 300 K. Determine the wavelength above which an intrinsic photodetector fabricated from this material will cease to operate.
- Write a short note on WDM.
- Write a short note on semiconductor optical amplifiers.
- What is FDDI? Explain in brief.
- Explain the following terms: Quantum Efficiency & Responsivity.

**Q.5 Attempt any two. 12**

- The radiative and nonradiative recombination lifetimes of the minority carriers in the active region of a double-heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination lifetime and the power internally generated within the device when the peak emission wavelength is  $0.87 \mu\text{m}$  at a drive current of 40 mA.
- Explain in details types of Optical Amplifiers.
- Draw the equivalent circuit diagram of low impedance front end receiver amplifier and obtain the S/N ratio.

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No.**

Max. Marks: 70

Marks:14

14

- Page 10 of 12

- 10) Index grading may be achieved through the \_\_\_\_\_ of mobile ions across the core cladding interface within molten glass.
- a) Diffusion
  - b) Doping
  - c) Separation
  - d) Combination
- 11) The graded index profile which produce the best results for multimode optical propagation have refractive index profile
- a) Circular
  - b) Rectangular
  - c) Triangular
  - d) Parabolic
- 12) Attenuation per Km expressed in
- a) Ampere
  - b) Decibel per Km
  - c) Watt
  - d) None of these
- 13) The spectral linewidth of an LED operating at room temperature is the 0.8 to 0.9  $\mu\text{m}$  wavelength band is usually between \_\_\_\_\_ at the half maximum intensity points
- a) 10 to 15 nm
  - b) 20 to 30 nm
  - c) 25 to 40 nm
  - d) 10 to 15 nm
- 14) The internal quantum efficiency of LED decreases with \_\_\_\_\_.
- a) Increase in temp
  - b) Decrease in temp
  - c) increase in pressure
  - d) Both a and c

Seat No.	
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Set **S**

**T.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.

**Section – I**

**Q.2 Answer the following (Any Four)** **16**

- a) An optical fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59. Determine
  - i) The acceptance angle for the fiber in water which has a refractive index of 1.33
  - ii) The critical angle at the core-cladding interface.
- b) Derive the expression for Numerical Aperture
- c) Briefly write about non-linear scattering losses observed in fiber optics.
- d) Explain the principle operation / concept of double heterojunction LED.
- e) Write Comparison between step index fiber and graded index fiber

**Q.3 Answer the following (Any Two)** **12**

- a) A silica optical fiber with core diameter large enough to be considered ray theory analysis has a core refractive index of 1.50 and a cladding refractive index of 1.47. Determine
  - i) The critical angle at the core-cladding interface
  - ii) The NA for the fiber
  - iii) The acceptance angle in air for the fiber.
- b) What are splices? Explain techniques for splicing.
- c) With energy state diagram explain working of laser

**Section – II**

**Q.4 Attempt any Four.** **16**

- a) A GaAs has a bandgap energy of 1.43 eV at 300 K. Determine the wavelength above which an intrinsic photodetector fabricated from this material will cease to operate.
- b) Write a short note on WDM.
- c) Write a short note on semiconductor optical amplifiers.
- d) What is FDDI? Explain in brief.
- e) Explain the following terms: Quantum Efficiency & Responsivity.

**Q.5 Attempt any two.** **12**

- a) The radiative and nonradiative recombination lifetimes of the minority carriers in the active region of a double-heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination lifetime and the power internally generated within the device when the peak emission wavelength is  $0.87 \mu\text{m}$  at a drive current of 40 mA.
- b) Explain in details types of Optical Amplifiers.
- c) Draw the equivalent circuit diagram of low impedance front end receiver amplifier and obtain the S/N ratio.

<b>Seat No.</b>	
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Robotics**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Following question includes Section I & Section II.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.1 Attempt any Four.** **20**
- a) Classify robot on coordinate system and explain with neat diagram.
  - b) List and elaborate any two control methods of robotics.
  - c) Discuss key issues for locomotion.
  - d) Define transducer and sensor. Discuss proximity sensor with neat diagram.
  - e) List and elaborate any two-position sensor.

**Section - II**

- Q.2 Attempt any Three.** **30**
- a) Discuss welding and spray-painting applications of robots.
  - b) Describe working of robotics for part sorting application with neat sketch.
  - c) Compare stationary and mobile robots based on construction, speed, capacity and applications.
  - d) With neat sketch explain basic visual sensing system.



<b>Seat No.</b>	
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**Set**

<b>Q</b>
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Robotics**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Following question includes Section I & Section II.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.1 Attempt any Four.**

**20**

- a) Classify robot on coordinate system and explain with neat diagram.
- b) List and elaborate any two control methods of robotics.
- c) Discuss key issues for locomotion.
- d) Define transducer and sensor. Discuss proximity sensor with neat diagram.
- e) List and elaborate any two-position sensor.

**Section - II**

**Q.2 Attempt any Three.**

**30**

- a) Discuss welding and spray-painting applications of robots.
- b) Describe working of robotics for part sorting application with neat sketch.
- c) Compare stationary and mobile robots based on construction, speed, capacity and applications.
- d) With neat sketch explain basic visual sensing system.

<b>Seat No.</b>	
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Robotics**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Following question includes Section I & Section II.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.1 Attempt any Four.** **20**
- a) Classify robot on coordinate system and explain with neat diagram.
  - b) List and elaborate any two control methods of robotics.
  - c) Discuss key issues for locomotion.
  - d) Define transducer and sensor. Discuss proximity sensor with neat diagram.
  - e) List and elaborate any two-position sensor.

**Section - II**

- Q.2 Attempt any Three.** **30**
- a) Discuss welding and spray-painting applications of robots.
  - b) Describe working of robotics for part sorting application with neat sketch.
  - c) Compare stationary and mobile robots based on construction, speed, capacity and applications.
  - d) With neat sketch explain basic visual sensing system.

<b>Seat No.</b>	
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Robotics**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Following question includes Section I & Section II.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.1 Attempt any Four.**

**20**

- a) Classify robot on coordinate system and explain with neat diagram.
- b) List and elaborate any two control methods of robotics.
- c) Discuss key issues for locomotion.
- d) Define transducer and sensor. Discuss proximity sensor with neat diagram.
- e) List and elaborate any two-position sensor.

**Section - II**

**Q.2 Attempt any Three.**

**30**

- a) Discuss welding and spray-painting applications of robots.
- b) Describe working of robotics for part sorting application with neat sketch.
- c) Compare stationary and mobile robots based on construction, speed, capacity and applications.
- d) With neat sketch explain basic visual sensing system.

Seat No.	
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Set

P

**T.Y. (B. Tech.) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Automotive Electronics**

Day & Date: Monday 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the option.****10**

- 1) What does a sensor do?
  - a) it selects transmission gear ratio
  - b) it measures some variable
  - c) it is an output device
  - d) it sends signals to the driver
- 2) The advantage of a tubeless tyre over tube type tyre is \_\_\_\_\_.
  - a) Slow air leakage
  - b) better fuel efficiency
  - c) less chance of running flat
  - d) All mentioned
- 3) What does a microcomputer use to interface with other systems?
  - a) parallel interface
  - b) analog-to-digital converter
  - c) digital-to-analog converter
  - d) all of the above
- 4) A thermistor is, \_\_\_\_\_.
  - a) a semiconductor temperature sensor
  - b) a device for regulating engine temperature
  - c) a temperature control system for the passenger
  - d) a new type of transistor
- 5) What advantages does digital signal processing have over analog signal processing?
  - a) digital is more precise
  - b) digital doesn't drift with time and temperature
  - c) the same digital hardware can be used in many filters
  - d) all of the above
- 6) Odometer is an instrument used for measurement of \_\_\_\_\_.
  - a) Power
  - b) Fuel consumption
  - c) Engine r.p.m.
  - d) Distance
- 7) Which of the following is used by the Hall Effect pickup?
  - a) Thermistors
  - b) Potentiometers
  - c) Inductive transducers
  - d) Semiconductors

- 8) The skidding of vehicles, while sudden brakes are applied, is avoided through \_\_\_\_\_.  
a) antilock braking system                      b) engine management system  
c) automatic car parking system              d) driving system
- 9) An ohmmeter can be used to measure \_\_\_\_\_.  
a) plug lead resistance                      b) engine management system  
c) automatic car parking system              d) all of the above
- 10) The ignition component that steps up voltage is the:  
a) spark plug                                      b) condenser  
c) coil    d) king lead

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**T.Y. (B. Tech.) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Automotive Electronics**

Day & Date: Monday 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instructions:** 1) Both sections are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any three:** **12**
- a) Give brief information on instrumentation amplifier and Comparator.
  - b) What is working principle, characteristics of coolant temp sensor.
  - c) Classify and discuss IC engines in brief.
  - d) Explain different types of MAP sensor.
- Q.3 Attempt any one:** **08**
- a) Explain different electrical and electronic components used in automobiles.
  - b) Discuss different types of ADCs.

**Section – II**

- Q.4 Attempt any three:** **12**
- a) What are the types of actuators? Explain hydraulic actuators used in automobiles.
  - b) What are different methods of speed control in DC motor?
  - c) Discuss in brief electronic ignition system.
  - d) Discuss in brief on-board board diagnosis system in automotive.
- Q.5 Attempt any one:** **08**
- a) Describe working and different types of solenoid valves used in automotive.
  - b) Explain CAN bus working principle and CAN bus physical layer in detail.

<b>Seat No.</b>	
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Day & Date: Monday 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 10

10

- Page 4 of 12

- 9)** A thermistor is, \_\_\_\_\_.  
a) a semiconductor temperature sensor  
b) a device for regulating engine temperature  
c) a temperature control system for the passenger  
d) a new type of transistor
- 10)** What advantages does digital signal processing have over analog signal processing?  
a) digital is more precise  
b) digital doesn't drift with time and temperature  
c) the same digital hardware can be used in many filters  
d) all of the above



<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Automotive Electronics**

Day & Date: Monday 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instructions:** 1) Both sections are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any three:** **12**
- a) Give brief information on instrumentation amplifier and Comparator.
  - b) What is working principle, characteristics of coolant temp sensor.
  - c) Classify and discuss IC engines in brief.
  - d) Explain different types of MAP sensor.
- Q.3 Attempt any one:** **08**
- a) Explain different electrical and electronic components used in automobiles.
  - b) Discuss different types of ADCs.

**Section – II**

- Q.4 Attempt any three:** **12**
- a) What are the types of actuators? Explain hydraulic actuators used in automobiles.
  - b) What are different methods of speed control in DC motor?
  - c) Discuss in brief electronic ignition system.
  - d) Discuss in brief on-board board diagnosis system in automotive.
- Q.5 Attempt any one:** **08**
- a) Describe working and different types of solenoid valves used in automotive.
  - b) Explain CAN bus working principle and CAN bus physical layer in detail.

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech.) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Automotive Electronics**

Day & Date: Monday 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the option. 10**

- 1) An ohmmeter can be used to measure \_\_\_\_\_.  
a) plug lead resistance                      b) engine management system  
c) automatic car parking system      d) all of the above
- 2) The ignition component that steps up voltage is the:  
a) spark plug                                      b) condenser  
c) coil    d) king lead
- 3) What does a sensor do?  
a) it selects transmission gear ratio  
b) it measures some variable  
c) it is an output device  
d) it sends signals to the driver
- 4) The advantage of a tubeless tyre over tube type tyre is \_\_\_\_\_.  
a) Slow air leakage  
b) better fuel efficiency  
c) less chance of running flat  
d) All mentioned
- 5) What does a microcomputer use to interface with other systems?  
a) parallel interface                              b) analog-to-digital converter  
c) digital-to-analog converter              d) all of the above
- 6) A thermistor is, \_\_\_\_\_.  
a) a semiconductor temperature sensor  
b) a device for regulating engine temperature  
c) a temperature control system for the passenger  
d) a new type of transistor
- 7) What advantages does digital signal processing have over analog signal processing?  
a) digital is more precise  
b) digital doesn't drift with time and temperature  
c) the same digital hardware can be used in many filters  
d) all of the above

- 8) Odometer is an instrument used for measurement of \_\_\_\_\_.
  - a) Power
  - b) Fuel consumption
  - c) Engine r.p.m.
  - d) Distance
- 9) Which of the following is used by the Hall Effect pickup?
  - a) Thermistors
  - b) Potentiometers
  - c) Inductive transducers
  - d) Semiconductors
- 10) The skidding of vehicles, while sudden brakes are applied, is avoided through \_\_\_\_\_.
  - a) antilock braking system
  - b) engine management system
  - c) automatic car parking system
  - d) driving system

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech.) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Automotive Electronics**

Day & Date: Monday 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instructions:** 1) Both sections are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any three:** **12**
- a) Give brief information on instrumentation amplifier and Comparator.
  - b) What is working principle, characteristics of coolant temp sensor.
  - c) Classify and discuss IC engines in brief.
  - d) Explain different types of MAP sensor.
- Q.3 Attempt any one:** **08**
- a) Explain different electrical and electronic components used in automobiles.
  - b) Discuss different types of ADCs.

**Section – II**

- Q.4 Attempt any three:** **12**
- a) What are the types of actuators? Explain hydraulic actuators used in automobiles.
  - b) What are different methods of speed control in DC motor?
  - c) Discuss in brief electronic ignition system.
  - d) Discuss in brief on-board board diagnosis system in automotive.
- Q.5 Attempt any one:** **08**
- a) Describe working and different types of solenoid valves used in automotive.
  - b) Explain CAN bus working principle and CAN bus physical layer in detail.

Seat No.	
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**T.Y. (B. Tech.) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Automotive Electronics**

Day & Date: Monday 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the option. 10**

- 1) What does a microcomputer use to interface with other systems?
  - a) parallel interface
  - b) analog-to-digital converter
  - c) digital-to-analog converter
  - d) all of the above
- 2) A thermistor is, \_\_\_\_\_.
  - a) a semiconductor temperature sensor
  - b) a device for regulating engine temperature
  - c) a temperature control system for the passenger
  - d) a new type of transistor
- 3) What advantages does digital signal processing have over analog signal processing?
  - a) digital is more precise
  - b) digital doesn't drift with time and temperature
  - c) the same digital hardware can be used in many filters
  - d) all of the above
- 4) Odometer is an instrument used for measurement of \_\_\_\_\_.
  - a) Power
  - b) Fuel consumption
  - c) Engine r.p.m.
  - d) Distance
- 5) Which of the following is used by the Hall Effect pickup?
  - a) Thermistors
  - b) Potentiometers
  - c) Inductive transducers
  - d) Semiconductors
- 6) The skidding of vehicles, while sudden brakes are applied, is avoided through \_\_\_\_\_.
  - a) antilock braking system
  - b) engine management system
  - c) automatic car parking system
  - d) driving system
- 7) An ohmmeter can be used to measure \_\_\_\_\_.
  - a) plug lead resistance
  - b) engine management system
  - c) automatic car parking system
  - d) all of the above
- 8) The ignition component that steps up voltage is the:
  - a) spark plug
  - b) condenser
  - c) coil
  - d) king lead

- 9)** What does a sensor do?
- a) it selects transmission gear ratio
  - b) it measures some variable
  - c) it is an output device
  - d) it sends signals to the driver
- 10)** The advantage of a tubeless tyre over tube type tyre is \_\_\_\_\_
- a) Slow air leakage
  - b) better fuel efficiency
  - c) less chance of running flat
  - d) All mentioned

<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Automotive Electronics**

Day & Date: Monday 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instructions:** 1) Both sections are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any three:** **12**
- a) Give brief information on instrumentation amplifier and Comparator.
  - b) What is working principle, characteristics of coolant temp sensor.
  - c) Classify and discuss IC engines in brief.
  - d) Explain different types of MAP sensor.
- Q.3 Attempt any one:** **08**
- a) Explain different electrical and electronic components used in automobiles.
  - b) Discuss different types of ADCs.

**Section – II**

- Q.4 Attempt any three:** **12**
- a) What are the types of actuators? Explain hydraulic actuators used in automobiles.
  - b) What are different methods of speed control in DC motor?
  - c) Discuss in brief electronic ignition system.
  - d) Discuss in brief on-board board diagnosis system in automotive.
- Q.5 Attempt any one:** **08**
- a) Describe working and different types of solenoid valves used in automotive.
  - b) Explain CAN bus working principle and CAN bus physical layer in detail.

<b>Seat No.</b>	
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Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

10

- Page 1 of 12



- 8) Environmental and observational are the types of \_\_\_\_\_ errors.
- |               |                |
|---------------|----------------|
| a) Systematic | b) Gross       |
| c) Random     | d) Statistical |
- 9) An Ultrasonic sensor is used to measure \_\_\_\_\_.
- |             |                |
|-------------|----------------|
| a) Distance | b) Speed       |
| c) pH Value | d) Temperature |
- 10) Harmonics Distortion is due to?
- |                                      |
|--------------------------------------|
| a) DC level of the signal            |
| b) distortion in measuring equipment |
| c) Non linear device or system       |
| d) none of mentioned                 |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Instrumentation**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instructions:** 1) Both Sections are compulsory.  
2) Figures to the right indicate full marks.  
3) Use of electronic component data sheet is allowed.  
4) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any three questions:** **12**

- a) Define the following terms related to measurement
  - 1) Arithmetic mean
  - 2) Average value
  - 3) Deviation
  - 4) Standard deviation
- b) What are international, primary, secondary, and working standards of measurement?
- c) What is electromagnetic interference? What causes electromagnetic interference? How to prevent EMI?
- d) Draw block diagram of digital tachometer and describe it's working.

**Q.3 Solve any one question:** **08**

- a) Draw block diagram of electronic counter and describe various of modes of working.
- b) Why AC signal conditioning is necessary? With suitable block diagram explain working of AC signal conditioning system.

**Section – II**

**Q.4 Solve any three questions:** **12**

- a) What is wave analyzer? What is the principle of its working? Explain working of Basic wave analyzer with suitable circuit.
- b) Explain operation of X-Y recorder with help of block diagram.
- c) Discuss in brief self-testing of smart sensor and their applications.
- d) Discuss application and limitation of spectrum analyzer.

**Q.5 Solve any one question:** **08**

- a) What is DAS? Draw block diagram of DAS. Write function of each block.
- b) With suitable block diagram explain working of data logger.

**Seat  
No.**

Set Q

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

10

- Page 4 of 12

- 9) For lower accuracies \_\_\_\_.
- a) digital acquisition system is used
  - b) both digital and analog acquisition systems are used
  - c) analog acquisition system is used
  - d) mechanical data acquisition system is sued
- 10) The degree of closeness of a measurement compared to the expected value is \_\_\_\_.
- a) Measurement
  - b) resolution
  - c) precision
  - d) accuracy

<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Instrumentation**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Both Sections are compulsory.  
2) Figures to the right indicate full marks.  
3) Use of electronic component data sheet is allowed.  
4) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any three questions:** **12**

- a) Define the following terms related to measurement
  - 1) Arithmetic mean
  - 2) Average value
  - 3) Deviation
  - 4) Standard deviation
- b) What are international, primary, secondary, and working standards of measurement?
- c) What is electromagnetic interference? What causes electromagnetic interference? How to prevent EMI?
- d) Draw block diagram of digital tachometer and describe it's working.

**Q.3 Solve any one question:** **08**

- a) Draw block diagram of electronic counter and describe various of modes of working.
- b) Why AC signal conditioning is necessary? With suitable block diagram explain working of AC signal conditioning system.

**Section – II**

**Q.4 Solve any three questions:** **12**

- a) What is wave analyzer? What is the principle of its working? Explain working of Basic wave analyzer with suitable circuit.
- b) Explain operation of X-Y recorder with help of block diagram.
- c) Discuss in brief self-testing of smart sensor and their applications.
- d) Discuss application and limitation of spectrum analyzer.

**Q.5 Solve any one question:** **08**

- a) What is DAS? Draw block diagram of DAS. Write function of each block.
- b) With suitable block diagram explain working of data logger.

**Seat  
No.**

Set	R
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Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

10

- Page 7 of 12

- 8) In single channel data acquisition system, the output of the buffer circuitry is \_\_\_\_.
- |           |            |
|-----------|------------|
| a) Analog | b) digital |
| c) zero   | d) mixed   |
- 9) \_\_\_\_ is a quantitative measure of acidity.
- |              |                  |
|--------------|------------------|
| a) Indicator | b) pH            |
| c) Hp        | d) balance scale |
- 10) Environmental and observational are the types of \_\_\_\_ errors.
- |               |                |
|---------------|----------------|
| a) Systematic | b) Gross       |
| c) Random     | d) Statistical |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Instrumentation**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instructions:** 1) Both Sections are compulsory.  
2) Figures to the right indicate full marks.  
3) Use of electronic component data sheet is allowed.  
4) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any three questions:** **12**

- a) Define the following terms related to measurement
  - 1) Arithmetic mean
  - 2) Average value
  - 3) Deviation
  - 4) Standard deviation
- b) What are international, primary, secondary, and working standards of measurement?
- c) What is electromagnetic interference? What causes electromagnetic interference? How to prevent EMI?
- d) Draw block diagram of digital tachometer and describe it's working.

**Q.3 Solve any one question:** **08**

- a) Draw block diagram of electronic counter and describe various of modes of working.
- b) Why AC signal conditioning is necessary? With suitable block diagram explain working of AC signal conditioning system.

**Section – II**

**Q.4 Solve any three questions:** **12**

- a) What is wave analyzer? What is the principle of its working? Explain working of Basic wave analyzer with suitable circuit.
- b) Explain operation of X-Y recorder with help of block diagram.
- c) Discuss in brief self-testing of smart sensor and their applications.
- d) Discuss application and limitation of spectrum analyzer.

**Q.5 Solve any one question:** **08**

- a) What is DAS? Draw block diagram of DAS. Write function of each block.
- b) With suitable block diagram explain working of data logger.



Seat No.	
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Set	S
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Instrumentation**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternative from the options. 10**

- 1) For measuring speed of motor \_\_\_\_\_ is used.
 

a) Tachometer	b) pH meter
c) X-Y recorder	d) X-Y plotter
- 2) For lower accuracies \_\_\_\_\_.
 

a) digital acquisition system is used
b) both digital and analog acquisition systems are used
c) analog acquisition system is used
d) mechanical data acquisition system is used
- 3) The degree of closeness of a measurement compared to the expected value is \_\_\_\_\_.
 

a) Measurement	b) resolution
c) precision	d) accuracy
- 4) In single channel data acquisition system, the output of the buffer circuitry is \_\_\_\_\_.
 

a) Analog	b) digital
c) zero	d) mixed
- 5) \_\_\_\_\_ is a quantitative measure of acidity.
 

a) Indicator	b) pH
c) Hp	d) balance scale
- 6) Environmental and observational are the types of \_\_\_\_\_ errors.
 

a) Systematic	b) Gross
c) Random	d) Statistical
- 7) An Ultrasonic sensor is used to measure \_\_\_\_\_.
 

a) Distance	b) Speed
c) pH Value	d) Temperature
- 8) Harmonics Distortion is due to?
 

a) DC level of the signal
b) distortion in measuring equipment
c) Non linear device or system
d) none of mentioned

- 9) Which of below is dynamic characteristics of an instrument?
- a) Accuracy
  - b) Resolution
  - c) Fidelity
  - d) Sensitivity
- 10) In signal generators, \_\_\_\_.
- a) Energy is created
  - b) Energy is generated
  - c) Energy is converted from a simple d.c. source into a.c. energy at specific frequency
  - d) All of the above

<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Instrumentation**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

- Instructions:** 1) Both Sections are compulsory.  
2) Figures to the right indicate full marks.  
3) Use of electronic component data sheet is allowed.  
4) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any three questions:** **12**

- a) Define the following terms related to measurement
  - 1) Arithmetic mean
  - 2) Average value
  - 3) Deviation
  - 4) Standard deviation
- b) What are international, primary, secondary, and working standards of measurement?
- c) What is electromagnetic interference? What causes electromagnetic interference? How to prevent EMI?
- d) Draw block diagram of digital tachometer and describe it's working.

**Q.3 Solve any one question:** **08**

- a) Draw block diagram of electronic counter and describe various of modes of working.
- b) Why AC signal conditioning is necessary? With suitable block diagram explain working of AC signal conditioning system.

**Section – II**

**Q.4 Solve any three questions:** **12**

- a) What is wave analyzer? What is the principle of its working? Explain working of Basic wave analyzer with suitable circuit.
- b) Explain operation of X-Y recorder with help of block diagram.
- c) Discuss in brief self-testing of smart sensor and their applications.
- d) Discuss application and limitation of spectrum analyzer.

**Q.5 Solve any one question:** **08**

- a) What is DAS? Draw block diagram of DAS. Write function of each block.
- b) With suitable block diagram explain working of data logger.

Seat No.	
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Set	P
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Programming with Java**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which of the following is not an OOPS concept in Java?
  - a) Polymorphism
  - b) Inheritance
  - c) Compilation
  - d) Encapsulation
- 2) Find the output of the following code.

```
int Integer = 24;
char String = 'I';
System.out.print(Integer);
System.out.print(String);
```

- a) Compile Error
  - b) 24  
I
  - c) 24I
  - d) Exception
- 3) Select the valid statement to declare and initialize an array.
    - a) `Int [] A={}`
    - b) `Int [] A={1,2,3}`
    - c) `Int [] A=[1,2,3]`
    - d) `Int [][] A={}`
  - 4) What is the extension of compiled java classes?
    - a) .txt
    - b) .js
    - c) .class
    - d) .java
  - 5) Identify Valid Identifiers from below:
    - a) Score
    - b) Class
    - c) Highest score
    - d) 1number
  - 6) Identify the corrected definition of a package \_\_\_\_\_.
    - a) A package is a collection of editing tools
    - b) A package is collection of classes
    - c) A package is a collection of classes and interfaces
    - d) A package is a collection of interfaces

- 7)** Which option is false about the final keyword?
- a) A final method cannot be overridden in its subclasses.
  - b) A final class cannot be extended
  - c) A final class can not extend other classes
  - d) A final method can be inherited
- 8)** Which key word is used for accessing the features of a package?
- a) Package
  - b) Import
  - c) Extends
  - d) Export
- 9)** How may threads can be executed at a time?
- a) Only one thread
  - b) Multiple threads
  - c) Only main (main method) thread
  - d) Two threads
- 10)** All Java exceptions can be handled gracefully.
- a) True
  - b) False

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Programming with Java**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Both Sections are compulsory.  
2) Figures to right indicate the full marks.

**Section – I**

**Q.2 Attempt any Two.** **08**

- a) Distinguish between OOP features of Java & C++
- b) List and explain principles of Object Oriented Programming.
- c) What do you mean by object and class? Explain each with examples.
- d) What is access specifier in Java? List & Explain different access specifiers?

**Q.3 Attempt the following.** **12**

- a) Define Strings and explain different String methods in Java.
- b) Describe in detail:
  - i) Different features of Java
  - ii) Java Virtual Machine and difference between bytecode and Machine code?

**Section – II**

**Q.4 Attempt any Two.** **08**

- a) What is an exception and how Java handles exceptions? Explain in detail.
- b) Distinguish between Inheritance and aggregation.
- c) What is the difference between Final, Finally and Finalize in Java?
- d) Differentiate between Abstract class and Interface

**Q.5 Answer the following.** **12**

- a) Explain the terms:
  - i) super
  - ii) abstract
  - iii) extends
- b) **Answer the following.**
  - i) What is Java Interface and why it's needed?
  - ii) Differentiate between overloading and overriding.

Seat No.	
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Set Q
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Programming with Java**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
  - 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
  - 3) Figures to the right indicate full marks.
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Identify the corrected definition of a package \_\_\_\_\_.
  - a) A package is a collection of editing tools
  - b) A package is collection of classes
  - c) A package is a collection of classes and interfaces
  - d) A package is a collection of interfaces
- 2) Which option is false about the final keyword?
  - a) A final method cannot be overridden in its subclasses.
  - b) A final class cannot be extended
  - c) A final class can not extend other classes
  - d) A final method can be inherited
- 3) Which key word is used for accessing the features of a package?
 

a) Package	b) Import
c) Extends	d) Export
- 4) How may threads can be executed at a time?
 

a) Only one thread	b) Multiple threads
c) Only main (main method) thread	d) Two threads
- 5) All Java exceptions can be handled gracefully.
 

a) True	b) False
---------	----------
- 6) Which of the following is not an OOPS concept in Java?
 

a) Polymorphism	b) Inheritance
c) Compilation	d) Encapsulation

7) Find the output of the following code.

```
int Integer = 24;  
char String = 'I';  
System.out.print(Integer);  
System.out.print(String);
```

- a) Compile Error                      b) 24  
c) 24l                                      d) Exception

**8)** Select the valid statement to declare and initialize an array.

- a) `Int [] A={}`
- b) `Int [] A={1,2,3}`
- c) `Int [] A=[1,2,3]`
- d) `Int [][] A={}`

**9)** What is the extension of compiled java classes?

- a) .txt    b) .js  
c) .class    d) .java

**10) Identify Valid Identifiers from below:**

- a) Score                      b) Class  
c) Highest score          d) 1number



<b>Seat No.</b>	
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<b>Set Q</b>
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Programming with Java**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Both Sections are compulsory.  
2) Figures to right indicate the full marks.

**Section – I**

**Q.2 Attempt any Two.** **08**

- a) Distinguish between OOP features of Java & C++
- b) List and explain principles of Object Oriented Programming.
- c) What do you mean by object and class? Explain each with examples.
- d) What is access specifier in Java? List & Explain different access specifiers?

**Q.3 Attempt the following.** **12**

- a) Define Strings and explain different String methods in Java.
- b) Describe in detail:
  - i) Different features of Java
  - ii) Java Virtual Machine and difference between bytecode and Machine code?

**Section – II**

**Q.4 Attempt any Two.** **08**

- a) What is an exception and how Java handles exceptions? Explain in detail.
- b) Distinguish between Inheritance and aggregation.
- c) What is the difference between Final, Finally and Finalize in Java?
- d) Differentiate between Abstract class and Interface

**Q.5 Answer the following.** **12**

- a) Explain the terms:
  - i) super
  - ii) abstract
  - iii) extends
- b) **Answer the following.**
  - i) What is Java Interface and why it's needed?
  - ii) Differentiate between overloading and overriding.

Seat No.	
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Set R
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Programming with Java**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) How many threads can be executed at a time?
  - a) Only one thread
  - b) Multiple threads
  - c) Only main (main method) thread
  - d) Two threads
- 3) All Java exceptions can be handled gracefully.
  - a) True
  - b) False
- 3) Which of the following is not an OOPS concept in Java?
  - a) Polymorphism
  - b) Inheritance
  - c) Compilation
  - d) Encapsulation
- 4) Find the output of the following code.

```
int Integer = 24;
char String = 'I';
System.out.print(Integer);
System.out.print(String);
```

- a) Compile Error
  - b) 24  
I
  - c) 24I
  - d) Exception
- 5) Select the valid statement to declare and initialize an array.
  - a) Int [] A={}
  - b) Int [] A={1,2,3}
  - c) Int [] A=[1,2,3]
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  - a) .txt
  - b) .js
  - c) .class
  - d) .java
- 7) Identify Valid Identifiers from below:
  - a) Score
  - b) Class
  - c) Highest score
  - d) 1number

- 8)** Identify the corrected definition of a package \_\_\_\_.
- a) A package is a collection of editing tools
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  - d) A package is a collection of interfaces
- 9)** Which option is false about the final keyword?
- a) A final method cannot be overridden in its subclasses.
  - b) A final class cannot be extended
  - c) A final class can not extend other classes
  - d) A final method can be inherited
- 10)** Which key word is used for accessing the features of a package?
- |            |           |
|------------|-----------|
| a) Package | b) Import |
| c) Extends | d) Export |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Programming with Java**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Both Sections are compulsory.  
2) Figures to right indicate the full marks.

**Section – I**

**Q.2 Attempt any Two.** **08**

- a) Distinguish between OOP features of Java & C++
- b) List and explain principles of Object Oriented Programming.
- c) What do you mean by object and class? Explain each with examples.
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**Q.3 Attempt the following.** **12**

- a) Define Strings and explain different String methods in Java.
- b) Describe in detail:
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**Section – II**

**Q.4 Attempt any Two.** **08**

- a) What is an exception and how Java handles exceptions? Explain in detail.
- b) Distinguish between Inheritance and aggregation.
- c) What is the difference between Final, Finally and Finalize in Java?
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- a) Explain the terms:
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- b) **Answer the following.**
  - i) What is Java Interface and why it's needed?
  - ii) Differentiate between overloading and overriding.

Seat No.	
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Programming with Java**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Select the valid statement to declare and initialize an array.
  - a) `Int [] A={}`
  - b) `Int [] A={1,2,3}`
  - c) `Int [] A=[1,2,3]`
  - d) `Int [][] A={}`
- 2) What is the extension of compiled java classes?
  - a) .txt
  - b) .js
  - c) .class
  - d) .java
- 3) Identify Valid Identifiers from below:
  - a) Score
  - b) Class
  - c) Highest score
  - d) 1number
- 4) Identify the corrected definition of a package \_\_\_\_\_.
  - a) A package is a collection of editing tools
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  - d) Export
- 7) How may threads can be executed at a time?
  - a) Only one thread
  - b) Multiple threads
  - c) Only main (main method) thread
  - d) Two threads

- 8)** All Java exceptions can be handled gracefully.  
a) True                                      b) False
- 9)** Which of the following is not an OOPS concept in Java?  
a) Polymorphism                            b) Inheritance  
c) Compilation                             d) Encapsulation
- 10)** Find the output of the following code.

---

```
int Integer = 24;  
char String = 'I';  
System.out.print(Integer);  
System.out.print(String);
```

- a) Compile Error                      b) 24  
c) 24I                                      d) Exception

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Programming with Java**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Both Sections are compulsory.  
2) Figures to right indicate the full marks.

**Section – I**

**Q.2 Attempt any Two.** **08**

- a) Distinguish between OOP features of Java & C++
- b) List and explain principles of Object Oriented Programming.
- c) What do you mean by object and class? Explain each with examples.
- d) What is access specifier in Java? List & Explain different access specifiers?

**Q.3 Attempt the following.** **12**

- a) Define Strings and explain different String methods in Java.
- b) Describe in detail:
  - i) Different features of Java
  - ii) Java Virtual Machine and difference between bytecode and Machine code?

**Section – II**

**Q.4 Attempt any Two.** **08**

- a) What is an exception and how Java handles exceptions? Explain in detail.
- b) Distinguish between Inheritance and aggregation.
- c) What is the difference between Final, Finally and Finalize in Java?
- d) Differentiate between Abstract class and Interface

**Q.5 Answer the following.** **12**

- a) Explain the terms:
  - i) super
  - ii) abstract
  - iii) extends
- b) **Answer the following.**
  - i) What is Java Interface and why it's needed?
  - ii) Differentiate between overloading and overriding.

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- 9) Class A and Class B choppers \_\_\_\_\_.  
a) Two quadrant converters      b) Three quadrant converters  
c) Single quadrant converters      d) None
- 10) For step up chopper  $V_s$  is source voltage,  $R_L$  is load resistance and  $K$  is duty cycle average output voltage of this chopper is \_\_\_\_\_.  
a)  $K \times V_s$       b)  $(1 - K)/V_s$   
c)  $V_s/K$       d)  $V_s/(1 - K)$
- 11) The number of thyristors required for single phase midpoint cycloconverters \_\_\_\_\_.  
a) 8      b) 6  
c) 4      d) 2
- 12) Cycloconverter is a combination of \_\_\_\_\_.  
a) Positive and negative converter  
b) Two positive converter  
c) Two negative converter  
d) None
- 13) Speed control of three phase AC motor can be obtained from \_\_\_\_\_.  
a) Multiphase chopper      b) Three phase controlled rectifier  
c) 3 phase bridge Inverter      d) Three phase dual converter
- 14) Three phase inverter converts \_\_\_\_\_.  
a) fixed DC to three phase AC      b) AC to DC  
c) DC to DC      d) AC to three phase AC

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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Power Electronics**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain the various mechanisms by which thyristors may be turn on.
- b) What is commutation? How commutation takes place in class C complementary commutation technique. Sketch associated waveforms.
- c) Derive an expression for average output dc voltage for single phase full wave controlled bridge rectifier with highly inductive load.
- d) A single phase semiconverter is operated from 120V, 50Hz AC supply. The  $R_L$  is  $10\Omega$ . If the average output voltage is 25% of the maximum possible output voltage. Determine
  - 1) Firing angle
  - 2) Average DC voltage
- e) Derive an expression of average dc output voltage of three phase half wave controlled rectifier with resistive load. Draw associated waveforms.

**Q.3 Solve any two** **12**

- a) Explain following methods of over voltage protections circuits.
  - 1) Snubber circuits for  $dv/dt$  suppression
  - 2) Electronic crowbar circuit
- b) Derive an expression for  $V_{dc}$  and  $V_{rms}$  of three phase semiconverter with resistive load for continuous conduction mode. Draw neat waveform for  $\alpha=30^\circ$ .
- c) Design microcontroller based firing scheme for Three phase fully controlled rectifiers.

**Section – II**

**Q.4 Solve any four** **16**

- a) Explain working of step down chopper and derive an expression for output voltage, duty cycle and effective input resistance.
- b) Explain operation of single phase midpoint cycloconverter with resistive load. The frequency is  $f_o/f_s = 1/5$ . Sketch associated waveforms.
- c) Explain operation of single phase full bridge voltage source inverter with inductive load. Draw associate waveforms.
- d) Explain operation of basic series resonant inverter. Draw associated waveforms.
- e) Describe the control circuit block diagram for three phase cycloconverter.

**Q.5 Solve any two**

- a)** Explain working of load commutated chopper. Sketch associated waveform.
- b)** Draw a block diagram of microcontroller based speed control of four quadrant AC drive and explain its working.
- c)** With an appropriate circuit diagram discuss working principle of three phase bridge inverter using  $180^\circ$  conduction mode, feeding star connected purely resistive load. Draw associated line and phase voltage waveforms.

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**Set Q**

## Max. Marks: 70

3) Assume suitable data wherever needed and mention it clearly.

Marks: 14

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- Page 5 of 16

- 9) Inductor is connected in series with the thyristor to \_\_\_\_\_.  
a) reduce  $dv/dt$  across it                      b) protect against  $di/dt$   
c) protect over voltage                              d) trigger thyristor
- 10) Class D commutation is \_\_\_\_\_.  
a) Auxiliary commutation technique  
b) load commutation technique  
c) current commutation technique  
d) resonant pulse commutation technique
- 11) PIV for single phase full bridge controlled rectifier is \_\_\_\_\_.  
a)  $2V_m$     b)  $V_m$   
c)  $3V_m$     d)  $4V_m$
- 12) Three phase full wave bridge converter with inductive load acts as \_\_\_\_\_.  
a) Single quadrant converter                      b) Two quadrant converter  
c) Three quadrant converter                        d) Four quadrant converter
- 13) In a three-phase full controlled rectifier, if the input frequency is 50 Hz, then output ripple frequency will be \_\_\_\_\_.  
a) 150 Hz    b) 300 Hz  
c) 100 Hz    d) 200 Hz
- 14) In Three phase full controlled bridge rectifier PIV across any thyristor is \_\_\_\_\_.  
a)  $\sqrt{2} V_m$     b)  $\sqrt{3} V_m$   
c)  $V_m$     d)  $\sqrt{3} V_{LL}$

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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Power Electronics**

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**Section – I**

**Q.2 Solve any four** **16**

- a) Explain the various mechanisms by which thyristors may be turn on.
- b) What is commutation? How commutation takes place in class C complementary commutation technique. Sketch associated waveforms.
- c) Derive an expression for average output dc voltage for single phase full wave controlled bridge rectifier with highly inductive load.
- d) A single phase semiconverter is operated from 120V, 50Hz AC supply. The  $R_L$  is  $10\Omega$ . If the average output voltage is 25% of the maximum possible output voltage. Determine
  - 1) Firing angle
  - 2) Average DC voltage
- e) Derive an expression of average dc output voltage of three phase half wave controlled rectifier with resistive load. Draw associated waveforms.

**Q.3 Solve any two** **12**

- a) Explain following methods of over voltage protections circuits.
  - 1) Snubber circuits for dv/dt suppression
  - 2) Electronic crowbar circuit
- b) Derive an expression for  $V_{dc}$  and  $V_{rms}$  of three phase semiconverter with resistive load for continuous conduction mode. Draw neat waveform for  $\alpha=30^\circ$ .
- c) Design microcontroller based firing scheme for Three phase fully controlled rectifiers.

**Section – II**

**Q.4 Solve any four** **16**

- a) Explain working of step down chopper and derive an expression for output voltage, duty cycle and effective input resistance.
- b) Explain operation of single phase midpoint cycloconverter with resistive load. The frequency is  $f_o/f_s = 1/5$ . Sketch associated waveforms.
- c) Explain operation of single phase full bridge voltage source inverter with inductive load. Draw associate waveforms.
- d) Explain operation of basic series resonant inverter. Draw associated waveforms.
- e) Describe the control circuit block diagram for three phase cycloconverter.

**Q.5 Solve any two**

- a)** Explain working of load commutated chopper. Sketch associated waveform.
- b)** Draw a block diagram of microcontroller based speed control of four quadrant AC drive and explain its working.
- c)** With an appropriate circuit diagram discuss working principle of three phase bridge inverter using  $180^\circ$  conduction mode, feeding star connected purely resistive load. Draw associated line and phase voltage waveforms.





- 9) Three phase full wave bridge converter with inductive load acts as \_\_\_\_\_.  
 a) Single quadrant converter      b) Two quadrant converter  
 c) Three quadrant converter      d) Four quadrant converter
- 10) In a three-phase full controlled rectifier, if the input frequency is 50 Hz, then output ripple frequency will be \_\_\_\_\_.  
 a) 150 Hz      b) 300 Hz  
 c) 100 Hz      d) 200 Hz
- 11) In Three phase full controlled bridge rectifier PIV across any thyristor is \_\_\_\_\_.  
 a)  $\sqrt{2} V_m$       b)  $\sqrt{3} V_m$   
 c)  $V_m$       d)  $\sqrt{3} V_{LL}$
- 12) The average value of the output voltage in a step - down de chopper is given by \_\_\_\_\_.  
 a)  $V_0 = V_s$       b)  $V_0 = K V_s$   
 c)  $V_0 = V_s/K$       d)  $V_0 = V_s/(1 - K)$
- 13) Class A and Class B choppers \_\_\_\_\_.  
 a) Two quadrant converters      b) Three quadrant converters  
 c) Single quadrant converters      d) None
- 14) For step up chopper  $V_s$  is source voltage,  $R_L$  is load resistance and  $K$  is duty cycle average output voltage of this chopper is \_\_\_\_\_.  
 a)  $K \times V_s$       b)  $(1 - K)/V_s$   
 c)  $V_s/K$       d)  $V_s/(1 - K)$

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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Power Electronics**

Day & Date: Wednesday, 25-01-2023  
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Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Solve any four** **16**

- a) Explain the various mechanisms by which thyristors may be turn on.
- b) What is commutation? How commutation takes place in class C complementary commutation technique. Sketch associated waveforms.
- c) Derive an expression for average output dc voltage for single phase full wave controlled bridge rectifier with highly inductive load.
- d) A single phase semiconverter is operated from 120V, 50Hz AC supply. The  $R_L$  is  $10\Omega$ . If the average output voltage is 25% of the maximum possible output voltage. Determine
  - 1) Firing angle
  - 2) Average DC voltage
- e) Derive an expression of average dc output voltage of three phase half wave controlled rectifier with resistive load. Draw associated waveforms.

**Q.3 Solve any two** **12**

- a) Explain following methods of over voltage protections circuits.
  - 1) Snubber circuits for dv/dt suppression
  - 2) Electronic crowbar circuit
- b) Derive an expression for  $V_{dc}$  and  $V_{rms}$  of three phase semiconverter with resistive load for continuous conduction mode. Draw neat waveform for  $\alpha=30^\circ$ .
- c) Design microcontroller based firing scheme for Three phase fully controlled rectifiers.

**Section – II**

**Q.4 Solve any four** **16**

- a) Explain working of step down chopper and derive an expression for output voltage, duty cycle and effective input resistance.
- b) Explain operation of single phase midpoint cycloconverter with resistive load. The frequency is  $f_o/f_s = 1/5$ . Sketch associated waveforms.
- c) Explain operation of single phase full bridge voltage source inverter with inductive load. Draw associate waveforms.
- d) Explain operation of basic series resonant inverter. Draw associated waveforms.
- e) Describe the control circuit block diagram for three phase cycloconverter.

**Q.5 Solve any two**

- a)** Explain working of load commutated chopper. Sketch associated waveform.
- b)** Draw a block diagram of microcontroller based speed control of four quadrant AC drive and explain its working.
- c)** With an appropriate circuit diagram discuss working principle of three phase bridge inverter using  $180^\circ$  conduction mode, feeding star connected purely resistive load. Draw associated line and phase voltage waveforms.

**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Power Electronics**

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.

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3) Assume suitable data wherever needed and mention it clearly.

Marks: 14

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- Page 13 of 16

- 8) Speed control of three phase AC motor can be obtained from \_\_\_\_\_.  
a) Multiphase chopper                      b) Three phase controlled rectifier  
c) 3 phase bridge Inverter                d) Three phase dual converter
- 9) Three phase inverter converts \_\_\_\_\_.  
a) fixed DC to three phase AC            b) AC to DC  
c) DC to DC                                    d) AC to three phase AC
- 10) Thyristor is a \_\_\_\_\_.  
a) DC switch                                    b) bilateral device  
c) latch proof device                        d) voltage controlled device
- 11) Inductor is connected in series with the thyristor to \_\_\_\_\_.  
a) reduce  $dv/dt$  across it                      b) protect against  $di/dt$   
c) protect over voltage                        d) trigger thyristor
- 12) Class D commutation is \_\_\_\_\_.  
a) Auxiliary commutation technique  
b) load commutation technique  
c) current commutation technique  
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- 13) PIV for single phase full bridge controlled rectifier is \_\_\_\_\_.  
a)  $2V_m$     b)  $V_m$   
c)  $3V_m$     d)  $4V_m$
- 14) Three phase full wave bridge converter with inductive load acts as \_\_\_\_\_.  
a) Single quadrant converter                b) Two quadrant converter  
c) Three quadrant converter                 d) Four quadrant converter

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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Power Electronics**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain the various mechanisms by which thyristors may be turn on.
- b) What is commutation? How commutation takes place in class C complementary commutation technique. Sketch associated waveforms.
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- d) A single phase semiconverter is operated from 120V, 50Hz AC supply. The  $R_L$  is  $10\Omega$ . If the average output voltage is 25% of the maximum possible output voltage. Determine
  - 1) Firing angle
  - 2) Average DC voltage
- e) Derive an expression of average dc output voltage of three phase half wave controlled rectifier with resistive load. Draw associated waveforms.

**Q.3 Solve any two** **12**

- a) Explain following methods of over voltage protections circuits.
  - 1) Snubber circuits for dv/dt suppression
  - 2) Electronic crowbar circuit
- b) Derive an expression for  $V_{dc}$  and  $V_{rms}$  of three phase semiconverter with resistive load for continuous conduction mode. Draw neat waveform for  $\alpha=30^\circ$ .
- c) Design microcontroller based firing scheme for Three phase fully controlled rectifiers.

**Section – II**

**Q.4 Solve any four** **16**

- a) Explain working of step down chopper and derive an expression for output voltage, duty cycle and effective input resistance.
- b) Explain operation of single phase midpoint cycloconverter with resistive load. The frequency is  $f_o/f_s = 1/5$ . Sketch associated waveforms.
- c) Explain operation of single phase full bridge voltage source inverter with inductive load. Draw associate waveforms.
- d) Explain operation of basic series resonant inverter. Draw associated waveforms.
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**Q.5 Solve any two**

- a)** Explain working of load commutated chopper. Sketch associated waveform.
- b)** Draw a block diagram of microcontroller based speed control of four quadrant AC drive and explain its working.
- c)** With an appropriate circuit diagram discuss working principle of three phase bridge inverter using  $180^\circ$  conduction mode, feeding star connected purely resistive load. Draw associated line and phase voltage waveforms.

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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is the condition for linear region?
 

a) $V_{gs}$ lesser than $V_t$	b) $V_{gs}$ greater than $V_t$
c) $V_{ds}$ lesser than $V_{gs}$	d) $V_{ds}$ greater than $V_{gs}$
- 2) As source drain voltage increases, channel depth \_\_\_\_\_.
 

a) Increases	b) decreases
c) logarithmically increases	d) exponentially increases
- 3) Gate area can be given as \_\_\_\_\_.
 

a) $L/W$	b) $L * W$
c) $2L/W$	d) $L/2W$
- 4) The overall delay is \_\_\_\_\_ to the relative resistance  $r$ .
 

a) Directly Proportional	b) Inversely Proportional
c) Exponentially proportional	d) Not dependent
- 5) Increase in switching speed \_\_\_\_\_ the noise problems.
 

a) increases	b) decreases
c) remains same	d) none of these
- 6) To design 3 input NOR Gate using CMOS Logic \_\_\_\_\_ number of Transistors are required if input signal is available in double rail format.
 

a) 4	b) 6
c) 8	d) 10
- 7) To design 3 input NAND Gate using Ratioed Logic \_\_\_\_\_ number of Transistors are required if inputs are available in double rail format.
 

a) 4	b) 5
c) 6	d) 8
- 8) A stored value remains valid as long as supply voltage is applied to the circuit is known as \_\_\_\_\_ storage device.
 

a) Dynamic	b) Bistable
c) Static	d) None of these



- 9) The \_\_\_\_\_ circuit store a charge on parasitic capacitor for temporary basis and it requires a periodic refresh of its stored value.
- a) Dynamic
  - b) Bistable
  - c) Static
  - d) None of these
- 10) The amount of time the input signal should be stable before the clock edge occurs is called as \_\_\_\_\_.
- a) Dynamic time
  - b) static time
  - c) Hold Time
  - d) Setup time
- 11) A \_\_\_\_\_ signal is one that has the same frequency but an unknown phase offset with respect to the local clock.
- a) Synchronous
  - b) Mesochronous
  - c) plesiochronous
  - d) Asynchronous
- 12) The spatial variation in arrival time of a clock transition on an integrated circuit is commonly referred to as \_\_\_\_\_.
- a) Clock Skew
  - b) Clock Jitter
  - c) Handshaking
  - d) Normalization
- 13) For synchronous circuits to solve the clock related to problem \_\_\_\_\_ is/are the solutions.
- a) Clock Distribution
  - b) Use synchronizers and Arbiters
  - c) Use PLL
  - d) All of these
- 14) With 4 bit select lines \_\_\_\_\_ operations can be performed by ALU.
- a) 10
  - b) 12
  - c) 16
  - d) 18

Seat No.	
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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data if necessary.  
 4) Draw neat diagrams.

**Section – I**

**Q.2 Answer any four.**

**16**

- With the help of diagram discuss construction and working of n-MOS also calculate value of  $\beta$  for given parameters of n-MOS transistor designed using Si as  $W/L$  ratio is 3.5, oxide layer thickness is 1.15 nm, the electron mobility is 85 sq. cm/V sec. The threshold voltage is 0.3V. The Si specific permittivity is 3.5 and permittivity of free space is  $8.85 \times 10^{-14}$  F/cm.
- What do you mean by technology scaling and how it is achieved in MOS transistor design?
- Draw and Explain CMOS inverter in detail and discuss transfer characteristics.
- How Dynamic Logic is used in CMOS Design explain using example.
- What is pass transistor? How it is used in designing CMOS Logic Gate using Example explain?

**Q.3 Solve any two.**

**12**

- Briefly explain in detail accumulation, depletion and inversion modes in MOS transistors.
- Calculate total power dissipation in CMOS inverter for frequency 10 MHz with Static power dissipation of  $15\mu\text{W}$ ,  $V_{DD} = 3.3$  V and  $C = 30$  fF.
- Design 2 input XOR gate using CMOS Logic and comment on number of transistors required to implement it.

**Section – II**

**Q.4 Attempt any four**

**16**

- What is bi-stability Principle? How it is used to design Latch explain using example.
- What is multiplexer-based latch? Explain the use of multiplexer-based latch to implement D Latch.
- With the help of diagram explain use of PLL for clock synchronization.
- What is clock skew and clock jitter? What are the reasons of clock skew and jitter?
- With the help of circuits explain ALU in detail.

**Q.5 Attempt any two.**

- a)** Explain operating principle of True single-phase clocked register (TSPCR) with help of diagram.
- b)** Explain timing classification in interconnect design.
- c)** With the help of Diagram explain Static RAM implementation.

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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
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**CMOS VLSI Design**

Day & Date: Tuesday, 31-01-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A stored value remains valid as long as supply voltage is applied to the circuit is known as \_\_\_\_\_ storage device.
  - a) Dynamic
  - b) Bistable
  - c) Static
  - d) None of these
- 2) The \_\_\_\_\_ circuit store a charge on parasitic capacitor for temporary basis and it requires a periodic refresh of its stored value.
  - a) Dynamic
  - b) Bistable
  - c) Static
  - d) None of these
- 3) The amount of time the input signal should be stable before the clock edge occurs is called as \_\_\_\_\_.
  - a) Dynamic time
  - b) static time
  - c) Hold Time
  - d) Setup time
- 4) A \_\_\_\_\_ signal is one that has the same frequency but an unknown phase offset with respect to the local clock.
  - a) Synchronous
  - b) Mesochronous
  - c) plesiochronous
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- 5) The spatial variation in arrival time of a clock transition on an integrated circuit is commonly referred to as \_\_\_\_\_.
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- 6) For synchronous circuits to solve the clock related to problem \_\_\_\_\_ is/are the solutions.
  - a) Clock Distribution
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  - c) Use PLL
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- 7) With 4 bit select lines \_\_\_\_\_ operations can be performed by ALU.
  - a) 10
  - b) 12
  - c) 16
  - d) 18

- 8) What is the condition for linear region?  
a)  $V_{gs}$  lesser than  $V_t$                       b)  $V_{gs}$  greater than  $V_t$   
c)  $V_{ds}$  lesser than  $V_{gs}$                       d)  $V_{ds}$  greater than  $V_{gs}$
- 9) As source drain voltage increases, channel depth \_\_\_\_\_.  
a) Increases                                      b) decreases  
c) logarithmically increases                  d) exponentially increases
- 10) Gate area can be given as \_\_\_\_\_.  
a)  $L/W$     b)  $L * W$   
c)  $2L/W$     d)  $L/2W$
- 11) The overall delay is \_\_\_\_\_ to the relative resistance  $r$ .  
a) Directly Proportional                      b) Inversely Proportional  
c) Exponentially proportional                  d) Not dependent
- 12) Increase in switching speed \_\_\_\_\_ the noise problems.  
a) increases                                      b) decreases  
c) remains same                                  d) none of these
- 13) To design 3 input NOR Gate using CMOS Logic \_\_\_\_\_ number of Transistors are required if input signal is available in double rail format.  
a) 4    b) 6  
c) 8    d) 10
- 14) To design 3 input NAND Gate using Ratioed Logic \_\_\_\_\_ number of Transistors are required if inputs are available in double rail format.  
a) 4    b) 5  
c) 6    d) 8

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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
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**Section – I**

**Q.2 Answer any four.**

**16**

- With the help of diagram discuss construction and working of n-MOS also calculate value of  $\beta$  for given parameters of n-MOS transistor designed using Si as  $W/L$  ratio is 3.5, oxide layer thickness is 1.15 nm, the electron mobility is 85 sq. cm/V sec. The threshold voltage is 0.3V. The Si specific permittivity is 3.5 and permittivity of free space is  $8.85 \times 10^{-14}$  F/cm.
- What do you mean by technology scaling and how it is achieved in MOS transistor design?
- Draw and Explain CMOS inverter in detail and discuss transfer characteristics.
- How Dynamic Logic is used in CMOS Design explain using example.
- What is pass transistor? How it is used in designing CMOS Logic Gate using Example explain?

**Q.3 Solve any two.**

**12**

- Briefly explain in detail accumulation, depletion and inversion modes in MOS transistors.
- Calculate total power dissipation in CMOS inverter for frequency 10 MHz with Static power dissipation of  $15\mu\text{W}$ ,  $V_{DD} = 3.3\text{ V}$  and  $C = 30\text{ fF}$ .
- Design 2 input XOR gate using CMOS Logic and comment on number of transistors required to implement it.

**Section – II**

**Q.4 Attempt any four**

**16**

- What is bi-stability Principle? How it is used to design Latch explain using example.
- What is multiplexer-based latch? Explain the use of multiplexer-based latch to implement D Latch.
- With the help of diagram explain use of PLL for clock synchronization.
- What is clock skew and clock jitter? What are the reasons of clock skew and jitter?
- With the help of circuits explain ALU in detail.

**Q.5 Attempt any two.**

- a)** Explain operating principle of True single-phase clocked register (TSPCR) with help of diagram.
- b)** Explain timing classification in interconnect design.
- c)** With the help of Diagram explain Static RAM implementation.

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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A \_\_\_\_\_ signal is one that has the same frequency but an unknown phase offset with respect to the local clock.
  - a) Synchronous
  - b) Mesochronous
  - c) plesiochronous
  - d) Asynchronous
- 2) The spatial variation in arrival time of a clock transition on an integrated circuit is commonly referred to as \_\_\_\_\_.
  - a) Clock Skew
  - b) Clock Jitter
  - c) Handshaking
  - d) Normalization
- 3) For synchronous circuits to solve the clock related to problem \_\_\_\_\_ is/are the solutions.
  - a) Clock Distribution
  - b) Use synchronizers and Arbiters
  - c) Use PLL
  - d) All of these
- 4) With 4 bit select lines \_\_\_\_\_ operations can be performed by ALU.
  - a) 10
  - b) 12
  - c) 16
  - d) 18
- 5) What is the condition for linear region?
  - a)  $V_{gs}$  lesser than  $V_t$
  - b)  $V_{gs}$  greater than  $V_t$
  - c)  $V_{ds}$  lesser than  $V_{gs}$
  - d)  $V_{ds}$  greater than  $V_{gs}$
- 6) As source drain voltage increases, channel depth \_\_\_\_\_.
  - a) Increases
  - b) decreases
  - c) logarithmically increases
  - d) exponentially increases
- 7) Gate area can be given as \_\_\_\_\_.
  - a)  $L/W$
  - b)  $L * W$
  - c)  $2L/W$
  - d)  $L/2W$
- 8) The overall delay is \_\_\_\_\_ to the relative resistance  $r$ .
  - a) Directly Proportional
  - b) Inversely Proportional
  - c) Exponentially proportional
  - d) Not dependent



- 9) Increase in switching speed \_\_\_\_\_ the noise problems.  
a) increases                      b) decreases  
c) remains same                d) none of these
- 10) To design 3 input NOR Gate using CMOS Logic \_\_\_\_\_ number of Transistors are required if input signal is available in double rail format.  
a) 4                                  b) 6  
c) 8                                  d) 10
- 11) To design 3 input NAND Gate using Ratioed Logic \_\_\_\_\_ number of Transistors are required if inputs are available in double rail format.  
a) 4                                  b) 5  
c) 6                                  d) 8
- 12) A stored value remains valid as long as supply voltage is applied to the circuit is known as \_\_\_\_\_ storage device.  
a) Dynamic                      b) Bistable  
c) Static                          d) None of these
- 13) The \_\_\_\_\_ circuit store a charge on parasitic capacitor for temporary basis and it requires a periodic refresh of its stored value.  
a) Dynamic                      b) Bistable  
c) Static                          d) None of these
- 14) The amount of time the input signal should be stable before the clock edge occurs is called as \_\_\_\_\_.  
a) Dynamic time                b) static time  
c) Hold Time                     d) Setup time

Seat No.	
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Set	R
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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
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 3) Assume suitable data if necessary.  
 4) Draw neat diagrams.

**Section – I**

**Q.2 Answer any four.**

**16**

- With the help of diagram discuss construction and working of n-MOS also calculate value of  $\beta$  for given parameters of n-MOS transistor designed using Si as  $W/L$  ratio is 3.5, oxide layer thickness is 1.15 nm, the electron mobility is 85 sq. cm/V sec. The threshold voltage is 0.3V. The Si specific permittivity is 3.5 and permittivity of free space is  $8.85 \times 10^{-14}$  F/cm.
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**Section – II**

**Q.4 Attempt any four**

**16**

- What is bi-stability Principle? How it is used to design Latch explain using example.
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<b>Seat No.</b>	
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  - c)  $2L/W$
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- 13) The overall delay is \_\_\_\_\_ to the relative resistance  $r$ .
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  - d) Not dependent
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  - b) decreases
  - c) remains same
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**Fourth. Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
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**CMOS VLSI Design**

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**Section – I**

**Q.2 Answer any four.**

**16**

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**Section – II**

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**Fourth Year (B.Tech.) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Mobile Technology**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of these is not true for TDD?
  - a) TDD uses different time slots for transmission and reception paths
  - b) Single radio frequency can be used
  - c) Duplexer is required
  - d) It increases the battery life of mobile phones
- 2) The connectivity from exchange to customer premises termed as \_\_\_\_\_.
  - a) Data network
  - b) Access Network or Local Loop
  - c) Bridge network
  - d) None of the above
- 3) The process of channel coding, Encryption, Multiplexing and modulation for Trans direction and reverse for reception are to be carried out by \_\_\_\_\_.
  - a) BTS
  - b) BSC
  - c) MSC
  - d) MS
- 4) The CDMA system has a soft capacity limit. That is increasing the number of users will \_\_\_\_\_ the system performance.
  - a) increases
  - b) decreases
  - c) stabilize
  - d) None of the above
- 5) CDMA base stations consumes \_\_\_\_\_ power than GSM and also covers a \_\_\_\_\_ distance.
  - a) more, large
  - b) less, large
  - c) less, less
  - d) None of the above
- 6) The cell size in CDMA is \_\_\_\_\_ compared to GSM.
  - a) larger
  - b) smaller
  - c) same
  - d) None of the above
- 7) Which of this is the interface between MS & BSS?
  - a) Um
  - b) A
  - c) Abis
  - d) None of the above





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**Fourth Year (B.Tech.) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Mobile Technology**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Compare different multiplexing schemes.
- b) Explain what a "Platform" is and what effect it has on mobile apps development. In your opinion, what are the 5 most useful mobile technologies currently available on cell phones?
- c) With suitable diagram explain concept of handoff and issues associated with it.
- d) With suitable example show how user capacity increases by decreasing cluster size. What is trade off for this?
- e) Discuss limitations of CDMA.

**Q.3 Attempt any Two.** **12**

- a) Derive an expression for S/I ratio and N (cluster size). With suitable example explain how this expression is used by a design engineer to plan cellular architecture.
- b) Explain long code scrambling in forward traffic channel in detail for CDMA-IS95.
- c) Explain TCH/FS, SACCH & FACCH channel coding in GSM signal processing.

**Section – II**

**Q.4 Attempt any Four.** **16**

- a) Explain its advantages & disadvantages with suitable examples of WLAN.
- b) What are different management functions supported by MAC?
- c) What are the characteristics of a mobile environment?
- d) What is tunneling? Why it is required?
- e) What is encapsulation? Why it is required?

**Q.5 Attempt any Two.** **12**

- a) Describe infrastructure architecture for WLAN. Explain its advantages & disadvantages with suitable examples.
- b) What are the services of IEEE 802.11 MAC layer?
- c) With suitable example and signal diagram, explain optimization in mobile IP.

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**Fourth Year (B.Tech.) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Mobile Technology**

Day & Date: Friday, 17-02-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

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- 1) Which of this is the interface between BTS and BSC?
  - a) Um
  - b) A
  - c) Abis
  - d) None of the above
- 2) Which of this is the interface within the GSM network architecture between the BSS (Base Station Subsystem) and an MSC (Mobile Switching Centre)?
  - a) A
  - b) B
  - c) C
  - d) D
- 3) The smallest inter frame spacing in MAC of 802.11 is \_\_\_\_\_.
  - a) DIFS
  - b) PIFS
  - c) SIFS
  - d) QIFS
- 4) RFCOMM in a Bluetooth Protocol Stack is a \_\_\_\_\_ Interface.
  - a) Host Controller
  - b) Link Control
  - c) Serial Line
  - d) Radio Frequency
- 5) Bluetooth is the wireless technology for \_\_\_\_\_.
  - a) local area network
  - b) personal area network
  - c) both (a) and (b)
  - d) none of the mentioned
- 6) Mostly \_\_\_\_\_ is used in wireless LAN.
  - a) time division multiplexing
  - b) orthogonal frequency division multiplexing
  - c) space division multiplexing
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- 7) IP assigned for a client by DHCP server is \_\_\_\_\_.
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**Fourth Year (B.Tech.) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Mobile Technology**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

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- a) Compare different multiplexing schemes.
- b) Explain what a "Platform" is and what effect it has on mobile apps development. In your opinion, what are the 5 most useful mobile technologies currently available on cell phones?
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- a) Derive an expression for S/I ratio and N (cluster size). With suitable example explain how this expression is used by a design engineer to plan cellular architecture.
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**Section – II**

**Q.4 Attempt any Four.** **16**

- a) Explain its advantages & disadvantages with suitable examples of WLAN.
- b) What are different management functions supported by MAC?
- c) What are the characteristics of a mobile environment?
- d) What is tunneling? Why it is required?
- e) What is encapsulation? Why it is required?

**Q.5 Attempt any Two.** **12**

- a) Describe infrastructure architecture for WLAN. Explain its advantages & disadvantages with suitable examples.
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- c) With suitable example and signal diagram, explain optimization in mobile IP.

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Mobile Technology**

Day & Date: Friday, 17-02-2023  
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Max. Marks: 70

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Duration: 30 Minutes

Marks: 14

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<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Mobile Technology**

Day & Date: Friday, 17-02-2023  
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**Q.4 Attempt any Four.** **16**

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Set	S
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c) MSC                      d) MS
- 13) The CDMA system has a soft capacity limit. That is increasing the number of users will \_\_\_\_\_ the system performance.  
a) increases                      b) decreases  
c) stabilize                      d) None of the above
- 14) CDMA base stations consumes \_\_\_\_\_ power than GSM and also covers a \_\_\_\_\_ distance.  
a) more, large                      b) less, large  
c) less, less                      d) None of the above

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**Fourth Year (B.Tech.) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Mobile Technology**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Compare different multiplexing schemes.
- b) Explain what a "Platform" is and what effect it has on mobile apps development. In your opinion, what are the 5 most useful mobile technologies currently available on cell phones?
- c) With suitable diagram explain concept of handoff and issues associated with it.
- d) With suitable example show how user capacity increases by decreasing cluster size. What is trade off for this?
- e) Discuss limitations of CDMA.

**Q.3 Attempt any Two.** **12**

- a) Derive an expression for S/I ratio and N (cluster size). With suitable example explain how this expression is used by a design engineer to plan cellular architecture.
- b) Explain long code scrambling in forward traffic channel in detail for CDMA-IS95.
- c) Explain TCH/FS, SACCH & FACCH channel coding in GSM signal processing.

**Section – II**

**Q.4 Attempt any Four.** **16**

- a) Explain its advantages & disadvantages with suitable examples of WLAN.
- b) What are different management functions supported by MAC?
- c) What are the characteristics of a mobile environment?
- d) What is tunneling? Why it is required?
- e) What is encapsulation? Why it is required?

**Q.5 Attempt any Two.** **12**

- a) Describe infrastructure architecture for WLAN. Explain its advantages & disadvantages with suitable examples.
- b) What are the services of IEEE 802.11 MAC layer?
- c) With suitable example and signal diagram, explain optimization in mobile IP.

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- 9) \_\_\_\_\_ controls the publish-subscribe messaging pattern in MQTT.
- |                |                  |
|----------------|------------------|
| a) MQTT broker | b) MQTT client   |
| c) MQTT server | d) None of these |
- 10) The MQTT publish-subscribe protocol is \_\_\_\_\_ driven.
- |           |                 |
|-----------|-----------------|
| a) Event  | b) Broker       |
| c) Client | d) All of these |
- 11) Things in IoT support \_\_\_\_\_.
- |                    |                 |
|--------------------|-----------------|
| a) Actuation       | b) Sensing      |
| c) Data Collection | d) All of above |
- 12) CoAP is an implementation of \_\_\_\_\_ model.
- |                                |                      |
|--------------------------------|----------------------|
| a) Message Oriented Middleware | b) RESTful           |
| c) Both a and b                | d) None of the above |
- 13) \_\_\_\_\_ can be considered as the skeleton for smart cities?
- |              |                   |
|--------------|-------------------|
| a) Banks     | b) Transportation |
| c) Buildings | d) Sensors        |
- 14) Sensor-Cloud deals with \_\_\_\_\_.
- |                        |                    |
|------------------------|--------------------|
| a) Sensor-as-a-Service | b) Sensor-in-Cloud |
| c) Sensor-for-Service  | d) None of these   |

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) List down all GPIO registers of LPC1768. Discuss IOSET register in details with examples.
- b) Draw a use case diagram for creating authentication code using SHA1 algorithm.
- c) List down and discuss the flags available in ARM Processors.
- d) Discuss the link register in details with neat diagrams.
- e) With a neat diagram illustrate the IoT reference architecture suggested by Oracle.

**Q.3 Solve any two of the following.** **12**

- a) Interface four LEDs to LPC1768 port pins P0.18-P0.21. Write an embedded c program to blink LEDs simultaneously.
- b) What do you mean by coarse-grain and fine-grain authorizations?
- c) What is significance of exceptions and interrupt in embedded application development and also explain the role of interrupt vector address and interrupt service routine.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Write a short note on Zigbee mesh routing.
- b) With a neat state diagram discuss Classic Bluetooth connection process.
- c) Write short note on RFID tags and RFID frequency bands.
- d) Write short note on Message Oriented Middleware (MOM) protocols.
- e) What is a Cloud? Discuss PaaS services supported in Cloud.

**Q.5 Solve any two of the following.** **12**

- a) List down different messages used in CoAP and elaborate with neat diagram a CoAP message format.
- b) With a neat state diagram discuss Bluetooth Low Energy mode connection process.
- c) Discuss the working principal of near-field RFID tags with neat diagrams.

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Set **Q**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ supports a long-range communication.
  - a) ZigBee
  - b) GPRS
  - c) Bluetooth
  - d) All of the above
- 2) \_\_\_\_\_ controls the publish-subscribe messaging pattern in MQTT.
  - a) MQTT broker
  - b) MQTT client
  - c) MQTT server
  - d) None of these
- 3) The MQTT publish-subscribe protocol is \_\_\_\_\_ driven.
  - a) Event
  - b) Broker
  - c) Client
  - d) All of these
- 4) Things in IoT support \_\_\_\_\_.
  - a) Actuation
  - b) Sensing
  - c) Data Collection
  - d) All of above
- 5) CoAP is an implementation of \_\_\_\_\_ model.
  - a) Message Oriented Middleware
  - b) RESTful
  - c) Both a and b
  - d) None of the above
- 6) \_\_\_\_\_ can be considered as the skeleton for smart cities?
  - a) Banks
  - b) Transportation
  - c) Buildings
  - d) Sensors
- 7) Sensor-Cloud deals with \_\_\_\_\_.
  - a) Sensor-as-a-Service
  - b) Sensor-in-Cloud
  - c) Sensor-for-Service
  - d) None of these
- 8) After the execution of following ARM instruction the content of R2 register will be \_\_\_\_\_ RSB R2, R2, R2, LSL #3.
  - a)  $R3 * 7$
  - b)  $R2 * 7$
  - c)  $R3 * 8$
  - d)  $R2 * 8$
- 9) In ARM Cortex M3 processor Nested Vectored Interrupt Controller (NVIC) supports \_\_\_\_\_.
  - a) Nested interrupt
  - b) Vectored interrupt
  - c) Dynamic priority
  - d) All of above

- 10)** ARM Cortex-M3 processor supports \_\_\_\_\_ interfaces.
- |                           |                 |
|---------------------------|-----------------|
| a) Code memory buses      | b) System bus   |
| c) Private peripheral bus | d) All of above |
- 11)** What is the value of R1 after MVN R1, #7 is executed?
- |               |                |
|---------------|----------------|
| a) 0x00000007 | b) 0xFFFFFFFF8 |
| c) 0xFFFFFFE  | d) 0xFFFFF8    |
- 12)** Let R0=0x00000000 and R1=0x00000055. What will be the content of R0 after execution of instruction "ADD R0, R1, R1, LSL #1"?
- |               |               |
|---------------|---------------|
| a) 0x00000000 | b) 0x00000005 |
| c) 0x000000FF | d) 0x0000000A |
- 13)** The \_\_\_\_\_ flag is set when a comparison of two data returns an equal result.
- |             |             |
|-------------|-------------|
| a) Zero     | b) Overflow |
| c) Negative | d) Carry    |
- 14)** LPC1768's maximum operating frequency is \_\_\_\_\_ MHz.
- |        |        |
|--------|--------|
| a) 100 | b) 110 |
| c) 12  | d) 60  |



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) List down all GPIO registers of LPC1768. Discuss IOSET register in details with examples.
- b) Draw a use case diagram for creating authentication code using SHA1 algorithm.
- c) List down and discuss the flags available in ARM Processors.
- d) Discuss the link register in details with neat diagrams.
- e) With a neat diagram illustrate the IoT reference architecture suggested by Oracle.

**Q.3 Solve any two of the following.** **12**

- a) Interface four LEDs to LPC1768 port pins P0.18-P0.21. Write an embedded c program to blink LEDs simultaneously.
- b) What do you mean by coarse-grain and fine-grain authorizations?
- c) What is significance of exceptions and interrupt in embedded application development and also explain the role of interrupt vector address and interrupt service routine.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Write a short note on Zigbee mesh routing.
- b) With a neat state diagram discuss Classic Bluetooth connection process.
- c) Write short note on RFID tags and RFID frequency bands.
- d) Write short note on Message Oriented Middleware (MOM) protocols.
- e) What is a Cloud? Discuss PaaS services supported in Cloud.

**Q.5 Solve any two of the following.** **12**

- a) List down different messages used in CoAP and elaborate with neat diagram a CoAP message format.
- b) With a neat state diagram discuss Bluetooth Low Energy mode connection process.
- c) Discuss the working principal of near-field RFID tags with neat diagrams.

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- 10)** The \_\_\_\_\_ flag is set when a comparison of two data returns an equal result.
- |             |             |
|-------------|-------------|
| a) Zero     | b) Overflow |
| c) Negative | d) Carry    |
- 11)** LPC1768's maximum operating frequency is \_\_\_\_\_ MHz.
- |        |        |
|--------|--------|
| a) 100 | b) 110 |
| c) 12  | d) 60  |
- 12)** \_\_\_\_\_ supports a long-range communication.
- |              |                     |
|--------------|---------------------|
| a) ZigBee    | b) GPRS             |
| c) Bluetooth | d) All of the above |
- 13)** \_\_\_\_\_ controls the publish-subscribe messaging pattern in MQTT.
- |                |                  |
|----------------|------------------|
| a) MQTT broker | b) MQTT client   |
| c) MQTT server | d) None of these |
- 14)** The MQTT publish-subscribe protocol is \_\_\_\_\_ driven.
- |           |                 |
|-----------|-----------------|
| a) Event  | b) Broker       |
| c) Client | d) All of these |

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) List down all GPIO registers of LPC1768. Discuss IOSET register in details with examples.
- b) Draw a use case diagram for creating authentication code using SHA1 algorithm.
- c) List down and discuss the flags available in ARM Processors.
- d) Discuss the link register in details with neat diagrams.
- e) With a neat diagram illustrate the IoT reference architecture suggested by Oracle.

**Q.3 Solve any two of the following.** **12**

- a) Interface four LEDs to LPC1768 port pins P0.18-P0.21. Write an embedded c program to blink LEDs simultaneously.
- b) What do you mean by coarse-grain and fine-grain authorizations?
- c) What is significance of exceptions and interrupt in embedded application development and also explain the role of interrupt vector address and interrupt service routine.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Write a short note on Zigbee mesh routing.
- b) With a neat state diagram discuss Classic Bluetooth connection process.
- c) Write short note on RFID tags and RFID frequency bands.
- d) Write short note on Message Oriented Middleware (MOM) protocols.
- e) What is a Cloud? Discuss PaaS services supported in Cloud.

**Q.5 Solve any two of the following.** **12**

- a) List down different messages used in CoAP and elaborate with neat diagram a CoAP message format.
- b) With a neat state diagram discuss Bluetooth Low Energy mode connection process.
- c) Discuss the working principal of near-field RFID tags with neat diagrams.

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The \_\_\_\_\_ flag is set when a comparison of two data returns an equal result.
 

a) Zero	b) Overflow
c) Negative	d) Carry
- 2) LPC1768's maximum operating frequency is \_\_\_\_\_ MHz.
 

a) 100	b) 110
c) 12	d) 60
- 3) \_\_\_\_\_ supports a long-range communication.
 

a) ZigBee	b) GPRS
c) Bluetooth	d) All of the above
- 4) \_\_\_\_\_ controls the publish-subscribe messaging pattern in MQTT.
 

a) MQTT broker	b) MQTT client
c) MQTT server	d) None of these
- 5) The MQTT publish-subscribe protocol is \_\_\_\_\_ driven.
 

a) Event	b) Broker
c) Client	d) All of these
- 6) Things in IoT support \_\_\_\_\_.
 

a) Actuation	b) Sensing
c) Data Collection	d) All of above
- 7) CoAP is an implementation of \_\_\_\_\_ model.
 

a) Message Oriented Middleware	b) RESTful
c) Both a and b	d) None of the above
- 8) \_\_\_\_\_ can be considered as the skeleton for smart cities?
 

a) Banks	b) Transportation
c) Buildings	d) Sensors
- 9) Sensor-Cloud deals with \_\_\_\_\_.
 

a) Sensor-as-a-Service	b) Sensor-in-Cloud
c) Sensor-for-Service	d) None of these

- 10)** After the execution of following ARM instruction the content of R2 register will be \_\_\_\_\_ RSB R2, R2, R2, LSL #3.
- |           |           |
|-----------|-----------|
| a) R3 * 7 | b) R2 * 7 |
| c) R3 * 8 | d) R2 * 8 |
- 11)** In ARM Cortex M3 processor Nested Vectored Interrupt Controller (NVIC) supports \_\_\_\_\_.
- |                     |                       |
|---------------------|-----------------------|
| a) Nested interrupt | b) Vectored interrupt |
| c) Dynamic priority | d) All of above       |
- 12)** ARM Cortex-M3 processor supports \_\_\_\_\_ interfaces.
- |                           |                 |
|---------------------------|-----------------|
| a) Code memory buses      | b) System bus   |
| c) Private peripheral bus | d) All of above |
- 13)** What is the value of R1 after MVN R1, #7 is executed?
- |               |                |
|---------------|----------------|
| a) 0x00000007 | b) 0xFFFFFFFF8 |
| c) 0xFFFFF8   | d) 0xFFFFF8    |
- 14)** Let R0=0x00000000 and R1=0x00000055. What will be the content of R0 after execution of instruction "ADD R0, R1, R1, LSL #1"?
- |               |               |
|---------------|---------------|
| a) 0x00000000 | b) 0x00000005 |
| c) 0x000000FF | d) 0x0000000A |

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) List down all GPIO registers of LPC1768. Discuss IOSET register in details with examples.
- b) Draw a use case diagram for creating authentication code using SHA1 algorithm.
- c) List down and discuss the flags available in ARM Processors.
- d) Discuss the link register in details with neat diagrams.
- e) With a neat diagram illustrate the IoT reference architecture suggested by Oracle.

**Q.3 Solve any two of the following.** **12**

- a) Interface four LEDs to LPC1768 port pins P0.18-P0.21. Write an embedded c program to blink LEDs simultaneously.
- b) What do you mean by coarse-grain and fine-grain authorizations?
- c) What is significance of exceptions and interrupt in embedded application development and also explain the role of interrupt vector address and interrupt service routine.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Write a short note on Zigbee mesh routing.
- b) With a neat state diagram discuss Classic Bluetooth connection process.
- c) Write short note on RFID tags and RFID frequency bands.
- d) Write short note on Message Oriented Middleware (MOM) protocols.
- e) What is a Cloud? Discuss PaaS services supported in Cloud.

**Q.5 Solve any two of the following.** **12**

- a) List down different messages used in CoAP and elaborate with neat diagram a CoAP message format.
- b) With a neat state diagram discuss Bluetooth Low Energy mode connection process.
- c) Discuss the working principal of near-field RFID tags with neat diagrams.

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P

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Database Management System**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which type of data can be stored in the database?
  - a) Image oriented data
  - b) Text, files containing data
  - c) Data in the form of audio or video
  - d) All of the above
- 2) Which of the following is not a function of the database?
  - a) Managing stored data
  - b) Manipulating data
  - c) Security for stored data
  - d) Analysing code
- 3) Identify the correct statement(s)
  - a) A candidate Key is a set of one or more attributes that, taken collectively allows us to identify any entity in the entity set
  - b) A Super Key is a set of one or more attributes that, taken collectively allows us to identify any entity in the entity set
  - c) A Super Key for which no proper subset is also a Superkey is called a Candidate Key
  - d) All of the above
- 4) Consider the two relation below. The primary keys are underlined Identify all possible foreign key(s) from the options  
 Customer (CustomerId, customer\_name, OrderId)  
 Orders (OrderId, Ordername, customer\_name)
  - a) CustomerId, OrderId
  - b) OrderId, customer\_name
  - c) OrderId
  - d) customer\_name
- 5) Identify the correct "Create Table" Statement for table given below:

Emp_id	Last_name	First_name	Age
1	Rai	Sanjiv	24
2	Singh	Sanjiv	24
3	Roy	Raman	23
4	Roy	Raman	21



- a) Create table employee(  
Emp\_id int,  
Last\_name varchar(55) not null,  
First\_name varchar(55),  
Age int,  
Primary key(ID))
  - b) Create table employee(  
Emp\_id int not null,  
Last\_name varchar(55) not null,  
First\_name varchar(55),  
Age int,  
Primary key(ID, Last\_name))
  - c) Create table employee(  
Emp\_id int,  
Last\_name varchar(55) not null,  
First\_name varchar(55),  
Age int,  
Primary key(ID, Last\_name))
  - d) Create table employee(  
Emp\_id int,  
Last\_name varchar(55) not null,  
First\_name varchar(55),  
Age int,  
Primary key(Last\_name))
- 6) Which of the following is not a valid aggregate function?
- a) COUNT
  - b) COMPUTE
  - c) SUM
  - d) MAX
- 7) Which operator is used to compare a value to a specified list of values?
- a) ANY
  - b) BETWEEN
  - c) ALL
  - d) IN
- 8) In addition to removing undesirable characteristics, normalization also eliminates \_\_\_\_\_ anomalies.
- a) Insert
  - b) Update
  - c) Delete
  - d) All of the above
- 9) Non-prime attributes cannot be transitively dependent, so the relation must have the \_\_\_\_\_ normal form.
- a) First
  - b) Second
  - c) Third
  - d) Fourth
- 10) A hashing function is used to generate the \_\_\_\_\_ of the data blocks in this technique.
- a) Data
  - b) Addresses
  - c) Numbers
  - d) Records
- 11) The nonleaf nodes of the B+- tree structure form a
- a) Multilevel clustered indices
  - b) Sparse indices
  - c) Multilevel dense indices
  - d) Multilevel sparse indices
- 12) What is the Dirty Read Problem also known as?
- a) W-W Conflict
  - b) W-R Conflict
  - c) R-R Conflict
  - d) None

- 13) Identify the correct statement(s) about the compatibility matrix given below

	S	X
S	True	False
X	False	False

- a) If a transaction holds an S lock on them, other transactions will be allowed to obtain X lock on the same
  - b) If a transaction holds an S lock on them, other transaction will not be allowed to obtain a S lock on the same then
  - c) If a transaction holds X lock on them, other transaction will be allowed to hold X or S lock on them
  - d) If a transaction holds an S lock on them, other transactions will allow to hold only S lock
- 14) A transaction that is inserting a new tuple into the database is given an
- a) Shared lock
  - b) Mutual lock
  - c) Exclusive lock
  - d) NO lock

Seat No.	
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Set **P**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Database Management System**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Three) 12**

- What are drawbacks of using File Processing System?
- Explain different aggregation functions with example.
- Explain concept of cardinality with example
- Define
  - Entity&Entity Sets
  - Attributes, Types of Attributes - Composite, Derived, Stored, Multivalued
- What are different DDL Statements? Create and insert commands with syntax and suitable examples

**Q.3 Answer the following (Any One) 08**

- Draw an ER diagram for a university database  
 Drawing of ER model of university database application considering the constraints -
  - Each department has multiple instructors
  - Each department is headed by one instructor as HOD
  - Each department offers multiple courses, each course is taught by a single instructor.
  - A student may enroll for many courses.
  - Department - the relevant attributes are department Name and location.
  - Course - The relevant attributes are courseNo, course Name, Duration, and prerequisite.
  - Instructor - The relevant attributes are Instructor Name, Room No, and telephone number.
  - Student - The relevant attributes are Student No, Student Name, and date of birth.

- Consider following tables and write the given query in SQL

*EmployeeInfo Table:*

EmpID	EmpFname	EmpLname	Department	Project	Address	DOB	Gender
1	Sanjay	Mehra	HR	P1	Hyderabad(HYD)	01-12-1976	M
2	Ananya	Mishra	Admin	P2	Delhi(DEL)	02-05-1968	F
3	Rohan	Diwan	Account	P3	Mumbai (BOM)	01-01-1980	M
4	Sonia	Kulkarni	HR	P1	Hyderabad(HYD)	02-05-1992	F
5	Ankit	Kapoor	Admin	P2	Delhi(DEL)	03-07-1994	M

*EmployeePosition Table:*

<b>EmpID</b>	<b>Emp Position</b>	<b>Data of Joining</b>	<b>Salary</b>
1	Manager	01-05-2022	500000
2	Executive	02-05-2022	75000
3	Manager	01-05-2022	90000
2	Lead	02-05-2022	85000
1	Executive	01-05-2022	300000

- Write a query to fetch the number of employees working in the department 'HR'.
- Write a query to find the names of employees that begin with 'S'.
- Write a query to fetch details of all employees excluding the employees with first names, "Sanjay" and "Sonia" from the EmployeeInfo table.
- Write a query find number of employees whose DOB is between 02/05/1970 to 31/12/1975 and are grouped according to gender

**Q.4** Explain the following joins with examples in SQL along with syntaxes

**08**

- Inner Join
- Right Join
- Left Join
- Full Outer Join

## Section – II

**Q.5 Solve (Any Three)**

**12**

- What is view serializable schedule? Check whether the following schedule is view serializable? If yes, Find the Correct Serial Schedule

T1	T2	T3
read(X)		
read(Y)		
write(X)		
	read(Y)	
		write(Y)
write(X)		
	read(Y)	

**S1**

- Define Normalization. Explain 1NF and 2NF with suitable examples
- Explain the terms: i) Transaction ii) ACID Property
- Explain B+ tree with examples and how insertion works
- Define Indexing. Explain primary Index, Secondary Index and Clustering Index.

**Q.6 Solve (Any One)**

**08**

- Explain Hashing in database with suitable example.
- Convert the below Schedule into Serial Schedule using Conflict Serializable Method

T1	T2	T3
read(X)		
	read(Y)	
		read(Y)
	write(Y)	
write(X)		
		write(X)
	Read(X)	
	write(X)	

**Q.7** Explain Time Stamp Protocol with suitable example

**08**

Seat No.	
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Set Q
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Database Management System**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In addition to removing undesirable characteristics, normalization also eliminates \_\_\_\_\_ anomalies.
  - a) Insert
  - b) Update
  - c) Delete
  - d) All of the above
- 2) Non-prime attributes cannot be transitively dependent, so the relation must have the \_\_\_\_\_ normal form.
  - a) First
  - b) Second
  - c) Third
  - d) Fourth
- 3) A hashing function is used to generate the \_\_\_\_\_ of the data blocks in this technique.
  - a) Data
  - b) Addresses
  - c) Numbers
  - d) Records
- 4) The nonleaf nodes of the B+- tree structure form a
  - a) Multilevel clustered indices
  - b) Sparse indices
  - c) Multilevel dense indices
  - d) Multilevel sparse indices
- 5) What is the Dirty Read Problem also known as?
  - a) W-W Conflict
  - b) W-R Conflict
  - c) R-R Conflict
  - d) None
- 6) Identify the correct statement(s) about the compatibility matrix given below

	S	X
S	True	False
X	False	False

- a) If a transaction holds an S lock on them, other transactions will be allowed to obtain X lock on the same
- b) If a transaction holds an S lock on them, other transaction will not be allowed to obtain a S lock on the same then
- c) If a transaction holds X lock on them, other transaction will be allowed to hold X or S lock on them

- d) If a transaction holds an S lock on them, other transactions will allow to hold only S lock
- 7) A transaction that is inserting a new tuple into the database is given an
- Shared lock
  - Mutual lock
  - Exclusive lock
  - NO lock
- 8) Which type of data can be stored in the database?
- Image oriented data
  - Text, files containing data
  - Data in the form of audio or video
  - All of the above
- 9) Which of the following is not a function of the database?
- Managing stored data
  - Manipulating data
  - Security for stored data
  - Analysing code
- 10) Identify the correct statement(s)
- A candidate Key is a set of one or more attributes that, taken collectively allows us to identify any entity in the entity set
  - A Super Key is a set of one or more attributes that, taken collectively allows us to identify any entity in the entity set
  - A Super Key for which no proper subset is also a Superkey is called a Candidate Key
  - All of the above
- 11) Consider the two relation below. The primary keys are underlined Identify all possible foreign key(s) from the options  
 Customer (CustomerId, customer\_name, OrderId)  
 Orders (OrderId, Ordername, customer\_name)
- CustomerId, OrderId
  - OrderId, customer\_name
  - OrderId
  - customer\_name
- 12) Identify the correct "Create Table" Statement for table given below:

Emp_id	Last_name	First_name	Age
1	Rai	Sanjiv	24
2	Singh	Sanjiv	24
3	Roy	Raman	23
4	Roy	Raman	21

- Create table employee(  
 Emp\_id int,  
 Last\_name varchar(55) not null,  
 First\_name varchar(55),  
 Age int,  
 Primary key(ID))
- Create table employee(  
 Emp\_id int not null,  
 Last\_name varchar(55) not null,  
 First\_name varchar(55),  
 Age int,  
 Primary key(ID, Last\_name))

- c) Create table employee(  
Emp\_id int,  
Last\_name varchar(55) not null,  
First\_name varchar(55),  
Age int,  
Primary key(ID, Last\_name))
  - d) Create table employee(  
Emp\_id int,  
Last\_name varchar(55) not null,  
First\_name varchar(55),  
Age int,  
Primary key(Last\_name))
- 13)** Which of the following is not a valid aggregate function?
- a) COUNT
  - b) COMPUTE
  - c) SUM
  - d) MAX
- 14)** Which operator is used to compare a value to a specified list of values?
- a) ANY
  - b) BETWEEN
  - c) ALL
  - d) IN

Seat No.	
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Set **Q**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Database Management System**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Three) 12**

- What are drawbacks of using File Processing System?
- Explain different aggregation functions with example.
- Explain concept of cardinality with example
- Define
  - Entity&Entity Sets
  - Attributes, Types of Attributes - Composite, Derived, Stored, Multivalued
- What are different DDL Statements? Create and insert commands with syntax and suitable examples

**Q.3 Answer the following (Any One) 08**

- Draw an ER diagram for a university database  
 Drawing of ER model of university database application considering the constraints -
  - Each department has multiple instructors
  - Each department is headed by one instructor as HOD
  - Each department offers multiple courses, each course is taught by a single instructor.
  - A student may enroll for many courses.
  - Department - the relevant attributes are department Name and location.
  - Course - The relevant attributes are courseNo, course Name, Duration, and prerequisite.
  - Instructor - The relevant attributes are Instructor Name, Room No, and telephone number.
  - Student - The relevant attributes are Student No, Student Name, and date of birth.

- Consider following tables and write the given query in SQL

*EmployeeInfo Table:*

EmpID	EmpFname	EmpLname	Department	Project	Address	DOB	Gender
1	Sanjay	Mehra	HR	P1	Hyderabad(HYD)	01-12-1976	M
2	Ananya	Mishra	Admin	P2	Delhi(DEL)	02-05-1968	F
3	Rohan	Diwan	Account	P3	Mumbai (BOM)	01-01-1980	M
4	Sonia	Kulkarni	HR	P1	Hyderabad(HYD)	02-05-1992	F
5	Ankit	Kapoor	Admin	P2	Delhi(DEL)	03-07-1994	M



*EmployeePosition Table:*

<b>EmpID</b>	<b>Emp Position</b>	<b>Data of Joining</b>	<b>Salary</b>
1	Manager	01-05-2022	500000
2	Executive	02-05-2022	75000
3	Manager	01-05-2022	90000
2	Lead	02-05-2022	85000
1	Executive	01-05-2022	300000

- Write a query to fetch the number of employees working in the department 'HR'.
- Write a query to find the names of employees that begin with 'S'.
- Write a query to fetch details of all employees excluding the employees with first names, "Sanjay" and "Sonia" from the EmployeeInfo table.
- Write a query find number of employees whose DOB is between 02/05/1970 to 31/12/1975 and are grouped according to gender

**Q.4** Explain the following joins with examples in SQL along with syntaxes

**08**

- Inner Join
- Right Join
- Left Join
- Full Outer Join

## Section – II

**Q.5 Solve (Any Three)**

**12**

- What is view serializable schedule? Check whether the following schedule is view serializable? If yes, Find the Correct Serial Schedule

T1	T2	T3
read(X)		
read(Y)		
write(X)		
	read(Y)	
		write(Y)
write(X)		
	read(Y)	

**S1**

- Define Normalization. Explain 1NF and 2NF with suitable examples
- Explain the terms: i) Transaction ii) ACID Property
- Explain B+ tree with examples and how insertion works
- Define Indexing. Explain primary Index, Secondary Index and Clustering Index.

**Q.6 Solve (Any One)**

**08**

- Explain Hashing in database with suitable example.
- Convert the below Schedule into Serial Schedule using Conflict Serializable Method

T1	T2	T3
read(X)		
	read(Y)	
		read(Y)
	write(Y)	
write(X)		
		write(X)
	Read(X)	
	write(X)	

**Q.7** Explain Time Stamp Protocol with suitable example

**08**

Seat No.	
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Set	R
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Database Management System**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The nonleaf nodes of the B+- tree structure form a
  - a) Multilevel clustered indices
  - b) Sparse indices
  - c) Multilevel dense indices
  - d) Multilevel sparse indices
- 2) What is the Dirty Read Problem also known as?
  - a) W-W Conflict
  - b) W-R Conflict
  - c) R-R Conflict
  - d) None
- 3) Identify the correct statement(s) about the compatibility matrix given below

	S	X
S	True	False
X	False	False

- a) If a transaction holds an S lock on them, other transactions will be allowed to obtain X lock on the same
  - b) If a transaction holds an S lock on them, other transaction will not be allowed to obtain a S lock on the same then
  - c) If a transaction holds X lock on them, other transaction will be allowed to hold X or S lock on them
  - d) If a transaction holds an S lock on them, other transactions will allow to hold only S lock
- 4) A transaction that is inserting a new tuple into the database is given an
  - a) Shared lock
  - b) Mutual lock
  - c) Exclusive lock
  - d) NO lock
- 5) Which type of data can be stored in the database?
  - a) Image oriented data
  - b) Text, files containing data
  - c) Data in the form of audio or video
  - d) All of the above
- 6) Which of the following is not a function of the database?
  - a) Managing stored data
  - b) Manipulating data
  - c) Security for stored data
  - d) Analysing code

- 7) Identify the correct statement(s)
- A candidate Key is a set of one or more attributes that, taken collectively allows us to identify any entity in the entity set
  - A Super Key is a set of one or more attributes that, taken collectively allows us to identify any entity in the entity set
  - A Super Key for which no proper subset is also a Superkey is called a Candidate Key
  - All of the above
- 8) Consider the two relation below. The primary keys are underlined Identify all possible foreign key(s) from the options  
 Customer (CustomerId, customer\_name, OrderId)  
 Orders (OrderId, Ordername, customer\_name)
- CustomerId, OrderId
  - OrderId, customer\_name
  - OrderId
  - customer\_name
- 9) Identify the correct "Create Table" Statement for table given below:

Emp_id	Last_name	First_name	Age
1	Rai	Sanjiv	24
2	Singh	Sanjiv	24
3	Roy	Raman	23
4	Roy	Raman	21

- Create table employee(  
 Emp\_id int,  
 Last\_name varchar(55) not null,  
 First\_name varchar(55),  
 Age int,  
 Primary key(ID))
- Create table employee(  
 Emp\_id int not null,  
 Last\_name varchar(55) not null,  
 First\_name varchar(55),  
 Age int,  
 Primary key(ID, Last\_name))
- Create table employee(  
 Emp\_id int,  
 Last\_name varchar(55) not null,  
 First\_name varchar(55),  
 Age int,  
 Primary key(ID, Last\_name))
- Create table employee(  
 Emp\_id int,  
 Last\_name varchar(55) not null,  
 First\_name varchar(55),  
 Age int,  
 Primary key(Last\_name))



Seat No.	
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Set **R**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Database Management System**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Three) 12**

- What are drawbacks of using File Processing System?
- Explain different aggregation functions with example.
- Explain concept of cardinality with example
- Define
  - Entity&Entity Sets
  - Attributes, Types of Attributes - Composite, Derived, Stored, Multivalued
- What are different DDL Statements? Create and insert commands with syntax and suitable examples

**Q.3 Answer the following (Any One) 08**

- Draw an ER diagram for a university database  
 Drawing of ER model of university database application considering the constraints -
  - Each department has multiple instructors
  - Each department is headed by one instructor as HOD
  - Each department offers multiple courses, each course is taught by a single instructor.
  - A student may enroll for many courses.
  - Department - the relevant attributes are department Name and location.
  - Course - The relevant attributes are courseNo, course Name, Duration, and prerequisite.
  - Instructor - The relevant attributes are Instructor Name, Room No, and telephone number.
  - Student - The relevant attributes are Student No, Student Name, and date of birth.

- Consider following tables and write the given query in SQL

*EmployeeInfo Table:*

EmpID	EmpFname	EmpLname	Department	Project	Address	DOB	Gender
1	Sanjay	Mehra	HR	P1	Hyderabad(HYD)	01-12-1976	M
2	Ananya	Mishra	Admin	P2	Delhi(DEL)	02-05-1968	F
3	Rohan	Diwan	Account	P3	Mumbai (BOM)	01-01-1980	M
4	Sonia	Kulkarni	HR	P1	Hyderabad(HYD)	02-05-1992	F
5	Ankit	Kapoor	Admin	P2	Delhi(DEL)	03-07-1994	M

*EmployeePosition Table:*

<b>EmpID</b>	<b>Emp Position</b>	<b>Data of Joining</b>	<b>Salary</b>
1	Manager	01-05-2022	500000
2	Executive	02-05-2022	75000
3	Manager	01-05-2022	90000
2	Lead	02-05-2022	85000
1	Executive	01-05-2022	300000

- Write a query to fetch the number of employees working in the department 'HR'.
- Write a query to find the names of employees that begin with 'S'.
- Write a query to fetch details of all employees excluding the employees with first names, "Sanjay" and "Sonia" from the EmployeeInfo table.
- Write a query find number of employees whose DOB is between 02/05/1970 to 31/12/1975 and are grouped according to gender

**Q.4** Explain the following joins with examples in SQL along with syntaxes

**08**

- Inner Join
- Right Join
- Left Join
- Full Outer Join

## Section – II

**Q.5 Solve (Any Three)**

**12**

- What is view serializable schedule? Check whether the following schedule is view serializable? If yes, Find the Correct Serial Schedule

T1	T2	T3
read(X)		
read(Y)		
write(X)		
	read(Y)	
		write(Y)
write(X)		
	read(Y)	

**S1**

- Define Normalization. Explain 1NF and 2NF with suitable examples
- Explain the terms: i) Transaction ii) ACID Property
- Explain B+ tree with examples and how insertion works
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**Q.6 Solve (Any One)**

**08**

- Explain Hashing in database with suitable example.
- Convert the below Schedule into Serial Schedule using Conflict Serializable Method

T1	T2	T3
read(X)		
	read(Y)	
		read(Y)
	write(Y)	
write(X)		
		write(X)
	Read(X)	
	write(X)	

**Q.7** Explain Time Stamp Protocol with suitable example

**08**

<b>Seat No.</b>	
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- | Emp_id | Last_name | First_name | Age |
|--------|-----------|------------|-----|
| 1      | Rai       | Sanjiv     | 24  |
| 2      | Singh     | Sanjiv     | 24  |
| 3      | Roy       | Raman      | 23  |
| 4      | Roy       | Raman      | 21  |



- b) Create table employee(  
Emp\_id int not null,  
Last\_name varchar(55) not null,  
First\_name varchar(55),  
Age int,  
Primary key(ID, Last\_name))
- c) Create table employee(  
Emp\_id int,  
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First\_name varchar(55),  
Age int,  
Primary key(ID, Last\_name))
- d) Create table employee(  
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Last\_name varchar(55) not null,  
First\_name varchar(55),  
Age int,  
Primary key(Last\_name))

Seat No.	
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Set **S**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Database Management System**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Three) 12**

- What are drawbacks of using File Processing System?
- Explain different aggregation functions with example.
- Explain concept of cardinality with example
- Define
  - Entity&Entity Sets
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**Q.3 Answer the following (Any One) 08**

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  - Each department has multiple instructors
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1	Executive	01-05-2022	300000

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- Write a query to find the names of employees that begin with 'S'.
- Write a query to fetch details of all employees excluding the employees with first names, "Sanjay" and "Sonia" from the EmployeeInfo table.
- Write a query find number of employees whose DOB is between 02/05/1970 to 31/12/1975 and are grouped according to gender

**Q.4** Explain the following joins with examples in SQL along with syntaxes

**08**

- Inner Join
- Right Join
- Left Join
- Full Outer Join

## Section – II

**Q.5 Solve (Any Three)**

**12**

- What is view serializable schedule? Check whether the following schedule is view serializable? If yes, Find the Correct Serial Schedule

T1	T2	T3
read(X)		
read(Y)		
write(X)		
	read(Y)	
		write(Y)
write(X)		
	read(Y)	

**S1**

- Define Normalization. Explain 1NF and 2NF with suitable examples
- Explain the terms: i) Transaction ii) ACID Property
- Explain B+ tree with examples and how insertion works
- Define Indexing. Explain primary Index, Secondary Index and Clustering Index.

**Q.6 Solve (Any One)**

**08**

- Explain Hashing in database with suitable example.
- Convert the below Schedule into Serial Schedule using Conflict Serializable Method

T1	T2	T3
read(X)		
	read(Y)	
		read(Y)
	write(Y)	
write(X)		
		write(X)
	Read(X)	
	write(X)	

**Q.7** Explain Time Stamp Protocol with suitable example

**08**

<b>Seat No.</b>	
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- 8) Which of the following is not a part of TTC?
- a) Tele-command transmitter
  - b) Delta processor
  - c) Delay line
  - d) All of these
- 9) Which of the following has largest traffic capacity?
- a) Communication sub-system
  - b) Power Sub-system
  - c) Altitude and orbit control sub-system
  - d) None
- 10) \_\_\_\_\_ angles determine where to point an earth station so that it intercepts the satellite.
- a) elevation, Azimuth
  - b) inclination, Azimuth
  - c) both
  - d) none
- 11) Which of the following factor is taken into account for satellite link design?
- a) Absorption of signal
  - b) Various noise sources present
  - c) Gain of transmitter and receiving antenna at both end
  - d) All of the above
- 12) Satellite multiple access techniques are \_\_\_\_\_.
- a) Frequency
  - b) Time
  - c) Space
  - d) All of the above
- 13) The angle b/w incident ray & normal to the plane is \_\_\_\_\_.
- a) Angle of reflection
  - b) Angle of Incident
  - c) Angle of coefficient
  - d) None of these
- 14) In second generation, wavelength of multimode fiber is \_\_\_\_\_.
- a) 1310 nm
  - b) 850 nm
  - c) 1420 nm
  - d) 1550 nm

<b>Seat No.</b>	
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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Advanced Communication Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any two of the following question. 12**

- a) Explain construction and working of two cavity Klystron. State its performance parameters.
- b) Draw block diagram of Pulse radar system and explain its working principle.
- c) Explain construction and working two-hole directional coupler. Derive its S-matrix.

**Q.3 Attempt any four of the following question. 16**

- a) With suitable Diagram explain working of Circulator.
- b) Explain radar system. State its advantages and disadvantages.
- c) Write a note on Phased array Radar.
- d) Explain construction and working of TRAPATT diode.
- e) Explain factors affecting range of radar.

**Section – II**

**Q.4 Attempt any two of the following question. 12**

- a) With suitable block diagrams explain Attitude and orbital control system.
- b) Explain construction and working of LASER diode.
- c) Explain working of GPS system.

**Q.5 Attempt any four of the following question. 16**

- a) Draw the block diagram of optical fiber communication.
- b) State range and application of LEO, MEO and GEO satellites.
- c) Explain basic antenna types used for satellite.
- d) Write a note on multiple accesses in satellite.
- e) Explain different losses in optical fiber.

Seat No.	
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Set Q
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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Advanced Communication Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not a part of TTC?
  - a) Tele-command transmitter      b) Delta processor
  - c) Delay line      d) All of these
- 2) Which of the following has largest traffic capacity?
  - a) Communication sub-system
  - b) Power Sub-system
  - c) Altitude and orbit control sub-system
  - d) None
- 3) \_\_\_\_\_ angles determine where to point an earth station so that it intercepts the satellite.
  - a) elevation, Azimuth      b) inclination, Azimuth
  - c) both      d) none
- 4) Which of the following factor is taken into account for satellite link design?
  - a) Absorption of signal
  - b) Various noise sources present
  - c) Gain of transmitter and receiving antenna at both end
  - d) All of the above
- 5) Satellite multiple access techniques are \_\_\_\_\_.
  - a) Frequency      b) Time
  - c) Space      d) All of the above
- 6) The angle b/w incident ray & normal to the plane is \_\_\_\_\_.
  - a) Angle of reflection      b) Angle of Incident
  - c) Angle of coefficient      d) None of these
- 7) In second generation, wavelength of multimode fiber is \_\_\_\_\_.
  - a) 1310 nm      b) 850 nm
  - c) 1420 nm      d) 1550 nm

- 8) If  $P_i$  is incident power  $P_f$  is forward power  $P_b$  is back power then coupling factor (c) is given by \_\_\_\_\_.  
a)  $c=10\log_{10}P_i/P_f$                       b)  $c=20\log_{10}P_i/P_f$   
c)  $c=10\log_{10}P_f/P_i$                       d)  $c=10\log_{10}P_i/P_b$
- 9) A Duplexer is used to \_\_\_\_\_.  
a) couple two antennas to a transmitter without interference  
b) isolate the antenna from the local oscillator  
c) prevent interference between two antennas connected to a receiver  
d) use an antenna for reception or transmission without interference
- 10) The drift space converts \_\_\_\_\_ modulation into \_\_\_\_\_ modulation.  
a) Low level, High level                      b) Current, Velocity  
c) Velocity, Current                      d) High level, Low level
- 11) A microwave junction is supposed to be matched at all ports if in the S matrix \_\_\_\_\_.  
a) all the diagonal elements are zero  
b) all the diagonal elements are equal but not zero  
c) all the diagonal elements are complex  
d) is Hermitian
- 12) MESFETS are \_\_\_\_\_.  
a) Bipolar microwave transistor                      b) Tripolar microwave transistor  
c) Unipolar microwave transistor                      d) None
- 13) Drawback of continuous wave radar is \_\_\_\_\_.  
a) They cannot measure temperature  
b) They cannot measure range  
c) They cannot measure speed  
d) They cannot measure phase
- 14) The type of radar that is used to eliminate clutter in navigational application is \_\_\_\_\_.  
a) pulse radar                      b) tracking radar  
c) MTI radar                      d) monopulse radar



<b>Seat No.</b>	
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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Advanced Communication Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any two of the following question. 12**

- a) Explain construction and working of two cavity Klystron. State its performance parameters.
- b) Draw block diagram of Pulse radar system and explain its working principle.
- c) Explain construction and working two-hole directional coupler. Derive its S-matrix.

**Q.3 Attempt any four of the following question. 16**

- a) With suitable Diagram explain working of Circulator.
- b) Explain radar system. State its advantages and disadvantages.
- c) Write a note on Phased array Radar.
- d) Explain construction and working of TRAPATT diode.
- e) Explain factors affecting range of radar.

**Section – II**

**Q.4 Attempt any two of the following question. 12**

- a) With suitable block diagrams explain Attitude and orbital control system.
- b) Explain construction and working of LASER diode.
- c) Explain working of GPS system.

**Q.5 Attempt any four of the following question. 16**

- a) Draw the block diagram of optical fiber communication.
- b) State range and application of LEO, MEO and GEO satellites.
- c) Explain basic antenna types used for satellite.
- d) Write a note on multiple accesses in satellite.
- e) Explain different losses in optical fiber.

Seat No.	
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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Advanced Communication Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following factor is taken into account for satellite link design?
  - a) Absorption of signal
  - b) Various noise sources present
  - c) Gain of transmitter and receiving antenna at both end
  - d) All of the above
- 2) Satellite multiple access techniques are \_\_\_\_\_.
  - a) Frequency
  - b) Time
  - c) Space
  - d) All of the above
- 3) The angle b/w incident ray & normal to the plane is \_\_\_\_\_.
  - a) Angle of reflection
  - b) Angle of Incident
  - c) Angle of coefficient
  - d) None of these
- 4) In second generation, wavelength of multimode fiber is \_\_\_\_\_.
  - a) 1310 nm
  - b) 850 nm
  - c) 1420 nm
  - d) 1550 nm
- 5) If  $P_i$  is incident power  $P_f$  is forward power  $P_b$  is back power then coupling factor (c) is given by \_\_\_\_\_.
  - a)  $c=10\log_{10}P_i/P_f$
  - b)  $c=20\log_{10}P_i/P_f$
  - c)  $c=10\log_{10}P_f/P_i$
  - d)  $c=10\log_{10}P_i/P_b$
- 6) A Duplexer is used to \_\_\_\_\_.
  - a) couple two antennas to a transmitter without interference
  - b) isolate the antenna from the local oscillator
  - c) prevent interference between two antennas connected to a receiver
  - d) use an antenna for reception or transmission without interference
- 7) The drift space converts \_\_\_\_\_ modulation into \_\_\_\_\_ modulation.
  - a) Low level, High level
  - b) Current, Velocity
  - c) Velocity, Current
  - d) High level, Low level

- 8) A microwave junction is supposed to be matched at all ports if in the S matrix \_\_\_\_\_.  
a) all the diagonal elements are zero  
b) all the diagonal elements are equal but not zero  
c) all the diagonal elements are complex  
d) is Hermitian
- 9) MESFETS are \_\_\_\_\_.  
a) Bipolar microwave transistor      b) Tripolar microwave transistor  
c) Unipolar microwave transistor      d) None
- 10) Drawback of continuous wave radar is \_\_\_\_\_.  
a) They cannot measure temperature  
b) They cannot measure range  
c) They cannot measure speed  
d) They cannot measure phase
- 11) The type of radar that is used to eliminate clutter in navigational application is \_\_\_\_\_.  
a) pulse radar      b) tracking radar  
c) MTI radar      d) monopulse radar
- 12) Which of the following is not a part of TTC?  
a) Tele-command transmitter      b) Delta processor  
c) Delay line      d) All of these
- 13) Which of the following has largest traffic capacity?  
a) Communication sub-system  
b) Power Sub-system  
c) Altitude and orbit control sub-system  
d) None
- 14) \_\_\_\_\_ angles determine where to point an earth station so that it intercepts the satellite.  
a) elevation, Azimuth      b) inclination, Azimuth  
c) both      d) none

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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Advanced Communication Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any two of the following question. 12**

- a) Explain construction and working of two cavity Klystron. State its performance parameters.
- b) Draw block diagram of Pulse radar system and explain its working principle.
- c) Explain construction and working two-hole directional coupler. Derive its S-matrix.

**Q.3 Attempt any four of the following question. 16**

- a) With suitable Diagram explain working of Circulator.
- b) Explain radar system. State its advantages and disadvantages.
- c) Write a note on Phased array Radar.
- d) Explain construction and working of TRAPATT diode.
- e) Explain factors affecting range of radar.

**Section – II**

**Q.4 Attempt any two of the following question. 12**

- a) With suitable block diagrams explain Attitude and orbital control system.
- b) Explain construction and working of LASER diode.
- c) Explain working of GPS system.

**Q.5 Attempt any four of the following question. 16**

- a) Draw the block diagram of optical fiber communication.
- b) State range and application of LEO, MEO and GEO satellites.
- c) Explain basic antenna types used for satellite.
- d) Write a note on multiple accesses in satellite.
- e) Explain different losses in optical fiber.

Seat No.	
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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Advanced Communication Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Drawback of continuous wave radar is \_\_\_\_\_.  
 a) They cannot measure temperature  
 b) They cannot measure range  
 c) They cannot measure speed  
 d) They cannot measure phase
- 2) The type of radar that is used to eliminate clutter in navigational application is \_\_\_\_\_.  
 a) pulse radar  
 b) tracking radar  
 c) MTI radar  
 d) monopulse radar
- 3) Which of the following is not a part of TTC?  
 a) Tele-command transmitter  
 b) Delta processor  
 c) Delay line  
 d) All of these
- 4) Which of the following has largest traffic capacity?  
 a) Communication sub-system  
 b) Power Sub-system  
 c) Altitude and orbit control sub-system  
 d) None
- 5) \_\_\_\_\_ angles determine where to point an earth station so that it intercepts the satellite.  
 a) elevation, Azimuth  
 b) inclination, Azimuth  
 c) both  
 d) none
- 6) Which of the following factor is taken into account for satellite link design?  
 a) Absorption of signal  
 b) Various noise sources present  
 c) Gain of transmitter and receiving antenna at both end  
 d) All of the above
- 7) Satellite multiple access techniques are \_\_\_\_\_.  
 a) Frequency  
 b) Time  
 c) Space  
 d) All of the above

- 8) The angle b/w incident ray & normal to the plane is \_\_\_\_\_.  
a) Angle of reflection                      b) Angle of Incident  
c) Angle of coefficient                      d) None of these
- 9) In second generation, wavelength of multimode fiber is \_\_\_\_\_.  
a) 1310 nm                                      b) 850 nm  
c) 1420 nm                                      d) 1550 nm
- 10) If  $P_i$  is incident power  $P_f$  is forward power  $P_b$  is back power then coupling factor (c) is given by \_\_\_\_\_.  
a)  $c=10\log_{10}P_i/P_f$                       b)  $c=20\log_{10}P_i/P_f$   
c)  $c=10\log_{10}P_f/P_i$                       d)  $c=10\log_{10}P_i/P_b$
- 11) A Duplexer is used to \_\_\_\_\_.  
a) couple two antennas to a transmitter without interference  
b) isolate the antenna from the local oscillator  
c) prevent interference between two antennas connected to a receiver  
d) use an antenna for reception or transmission without interference
- 12) The drift space converts \_\_\_\_\_ modulation into \_\_\_\_\_ modulation.  
a) Low level, High level                      b) Current, Velocity  
c) Velocity, Current                              d) High level, Low level
- 13) A microwave junction is supposed to be matched at all ports if in the S matrix \_\_\_\_\_.  
a) all the diagonal elements are zero  
b) all the diagonal elements are equal but not zero  
c) all the diagonal elements are complex  
d) is Hermitian
- 14) MESFETS are \_\_\_\_\_.  
a) Bipolar microwave transistor              b) Tripolar microwave transistor  
c) Unipolar microwave transistor              d) None

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**Fourth. Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Advanced Communication Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any two of the following question. 12**

- a) Explain construction and working of two cavity Klystron. State its performance parameters.
- b) Draw block diagram of Pulse radar system and explain its working principle.
- c) Explain construction and working two-hole directional coupler. Derive its S-matrix.

**Q.3 Attempt any four of the following question. 16**

- a) With suitable Diagram explain working of Circulator.
- b) Explain radar system. State its advantages and disadvantages.
- c) Write a note on Phased array Radar.
- d) Explain construction and working of TRAPATT diode.
- e) Explain factors affecting range of radar.

**Section – II**

**Q.4 Attempt any two of the following question. 12**

- a) With suitable block diagrams explain Attitude and orbital control system.
- b) Explain construction and working of LASER diode.
- c) Explain working of GPS system.

**Q.5 Attempt any four of the following question. 16**

- a) Draw the block diagram of optical fiber communication.
- b) State range and application of LEO, MEO and GEO satellites.
- c) Explain basic antenna types used for satellite.
- d) Write a note on multiple accesses in satellite.
- e) Explain different losses in optical fiber.

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- 10)** Moving Picture Experts Group (MPEG-2), was designed for high-quality DVD with a data rate of \_\_\_\_\_.  
a) 3 to 6 Mbps                      b) 4 to 6 Mbps  
c) 5 to 6 Mbps                      d) 6 to 8 Mbps
- 11)** Raster images are also known as \_\_\_\_\_.  
a) Bitmap images                  b) Vector images  
c) Clip art images                d) Multimedia images
- 12)** The two new signals generated in PAL system are \_\_\_\_\_.  
a) (B - Y) and (R - Y)          b) R and B  
c) I and Q                          d) U and V
- 13)** Paint programs and image editors are used for creating and editing \_\_\_\_\_.  
a) Text                                b) Vector images  
c) Bitmap images                 d) HTML codes
- 14)** Rooms vibrate and respond most readily to \_\_\_\_\_.  
a) Low frequencies                b) High frequencies  
c) Mid frequencies                d) None of the above

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Audio Video Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any four of the following question. 16**

- Define Amplitude, Frequency, Phase, and Wavelength for a sound wave.
- Write down step by step procedure for producing records.
- Discuss why FM is preferred to AM for sound signal transmission.
- Synchronizing pulses transmitted along with the picture signal justify the statement.
- How is the illusion of continuity created in television pictures? Why has the frame reception rate been chosen to be 25 and not 24 as in motion pictures?

**Q.3 Attempt any two of the following question. 12**

- If the gap width is 6 microns and the speed of tape is 4.75cm/s, calculate the maximum frequency of recording. What will happen if the tape speed is increased to 19cm/s? Comment for video frequencies.
- Discuss the factors which influence the choice of sub-carrier frequency in a colour TV system. Justify the choice of 3.579545 MHz as the subcarrier frequency in the NTSC system. How does it affect the line and field frequencies?
- Explain with a suitable block diagram the encoding process in the PAL colour system. Why is the colour burst signal transmitted after each scanning line?

**Section – II**

**Q.4 Attempt any four of the following question. 16**

- Discuss advantages of digital television.
- Explain how surround sound effect is produced in a digital TV system.
- Discuss different image data types and their file formats.
- List down different JPEG modes and discuss any one mode.
- Discuss the benefits offered by compression schemes in designing multimedia systems.

**Q.5 Attempt any two of the following question. 12**

- Draw a neat block diagram of a digital video transmitter and discuss the function of each block.
- Illustrate with a neat diagram the design for PA system for public meeting?
- Discuss bit allocation algorithm for MPEG-1 Layer 1 and Layer 2.

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- 9) The average rate of flow of sound energy through a cross-sectional area is called as \_\_\_\_\_.  
a) Intensity of sound                      b) Vibrations of sound  
c) Both a & b                                  d) None of above
- 10) \_\_\_\_\_ is the spectral purity of colour light.  
a) Luminance                                  b) Brightness  
c) Hue    d) Saturation
- 11) The phase of the colour subcarrier burst signal in PAL system is along the axis at \_\_\_\_\_.  
a)  $\pm 180^\circ$                                   b)  $\pm 45^\circ$   
c)  $180 \pm 45^\circ$                               d) None
- 12) In subtractive colour theory Cyan is formed by subtracting \_\_\_\_\_.  
a) White – Red                              b) White – Green  
c) White – Blue                              d) None of above
- 13) 625-B monochrome TV follows the interlaced scanning system, and each frame is divided into two fields, with \_\_\_\_\_.  
a) 312.5 lines/field                          b) 315 lines/field  
c) 625 lines/field                            d) 156 lines/field
- 14) The hue and saturation of a colour put together is known as \_\_\_\_\_.  
a) Colour mixing                            b) Chrominance  
c) Monochrome signal                      d) None of above

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Audio Video Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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 2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any four of the following question. 16**

- Define Amplitude, Frequency, Phase, and Wavelength for a sound wave.
- Write down step by step procedure for producing records.
- Discuss why FM is preferred to AM for sound signal transmission.
- Synchronizing pulses transmitted along with the picture signal justify the statement.
- How is the illusion of continuity created in television pictures? Why has the frame reception rate been chosen to be 25 and not 24 as in motion pictures?

**Q.3 Attempt any two of the following question. 12**

- If the gap width is 6 microns and the speed of tape is 4.75cm/s, calculate the maximum frequency of recording. What will happen if the tape speed is increased to 19cm/s? Comment for video frequencies.
- Discuss the factors which influence the choice of sub-carrier frequency in a colour TV system. Justify the choice of 3.579545 MHz as the subcarrier frequency in the NTSC system. How does it affect the line and field frequencies?
- Explain with a suitable block diagram the encoding process in the PAL colour system. Why is the colour burst signal transmitted after each scanning line?

**Section – II**

**Q.4 Attempt any four of the following question. 16**

- Discuss advantages of digital television.
- Explain how surround sound effect is produced in a digital TV system.
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- List down different JPEG modes and discuss any one mode.
- Discuss the benefits offered by compression schemes in designing multimedia systems.

**Q.5 Attempt any two of the following question. 12**

- Draw a neat block diagram of a digital video transmitter and discuss the function of each block.
- Illustrate with a neat diagram the design for PA system for public meeting?
- Discuss bit allocation algorithm for MPEG-1 Layer 1 and Layer 2.

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Audio Video Systems**

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

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- 10)** 625-B monochrome TV follows the interlaced scanning system, and each frame is divided into two fields, with \_\_\_\_\_.  
a) 312.5 lines/field                      b) 315 lines/field  
c) 625 lines/field                        d) 156 lines/field
- 11)** The hue and saturation of a colour put together is known as \_\_\_\_\_.  
a) Colour mixing                          b) Chrominance  
c) Monochrome signal                  d) None of above
- 12)** Joint Photographic Experts Group (JPEG) is used to compress \_\_\_\_\_.  
a) Music                                      b) Pictures  
c) Images                                     d) Frames
- 13)** A video consists of a sequence of \_\_\_\_\_.  
a) Frames                                    b) Signals  
c) Packets                                    d) Slots
- 14)** Moving Picture Experts Group (MPEG-2), was designed for high-quality DVD with a data rate of \_\_\_\_\_.  
a) 3 to 6 Mbps                              b) 4 to 6 Mbps  
c) 5 to 6 Mbps                              d) 6 to 8 Mbps

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov- 2022**  
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**Audio Video Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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 2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any four of the following question. 16**

- Define Amplitude, Frequency, Phase, and Wavelength for a sound wave.
- Write down step by step procedure for producing records.
- Discuss why FM is preferred to AM for sound signal transmission.
- Synchronizing pulses transmitted along with the picture signal justify the statement.
- How is the illusion of continuity created in television pictures? Why has the frame reception rate been chosen to be 25 and not 24 as in motion pictures?

**Q.3 Attempt any two of the following question. 12**

- If the gap width is 6 microns and the speed of tape is 4.75cm/s, calculate the maximum frequency of recording. What will happen if the tape speed is increased to 19cm/s? Comment for video frequencies.
- Discuss the factors which influence the choice of sub-carrier frequency in a colour TV system. Justify the choice of 3.579545 MHz as the subcarrier frequency in the NTSC system. How does it affect the line and field frequencies?
- Explain with a suitable block diagram the encoding process in the PAL colour system. Why is the colour burst signal transmitted after each scanning line?

**Section – II**

**Q.4 Attempt any four of the following question. 16**

- Discuss advantages of digital television.
- Explain how surround sound effect is produced in a digital TV system.
- Discuss different image data types and their file formats.
- List down different JPEG modes and discuss any one mode.
- Discuss the benefits offered by compression schemes in designing multimedia systems.

**Q.5 Attempt any two of the following question. 12**

- Draw a neat block diagram of a digital video transmitter and discuss the function of each block.
- Illustrate with a neat diagram the design for PA system for public meeting?
- Discuss bit allocation algorithm for MPEG-1 Layer 1 and Layer 2.



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Set **S**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Audio Video Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) 625-B monochrome TV follows the interlaced scanning system, and each frame is divided into two fields, with \_\_\_\_\_.  
 a) 312.5 lines/field                      b) 315 lines/field  
 c) 625 lines/field                        d) 156 lines/field
- 2) The hue and saturation of a colour put together is known as \_\_\_\_\_.  
 a) Colour mixing                        b) Chrominance  
 c) Monochrome signal                d) None of above
- 3) Joint Photographic Experts Group (JPEG) is used to compress \_\_\_\_\_.  
 a) Music                                      b) Pictures  
 c) Images                                    d) Frames
- 4) A video consists of a sequence of \_\_\_\_\_.  
 a) Frames                                    b) Signals  
 c) Packets                                   d) Slots
- 5) Moving Picture Experts Group (MPEG-2), was designed for high-quality DVD with a data rate of \_\_\_\_\_.  
 a) 3 to 6 Mbps                              b) 4 to 6 Mbps  
 c) 5 to 6 Mbps                              d) 6 to 8 Mbps
- 6) Raster images are also known as \_\_\_\_\_.  
 a) Bitmap images                        b) Vector images  
 c) Clip art images                        d) Multimedia images
- 7) The two new signals generated in PAL system are \_\_\_\_\_.  
 a) (B - Y) and (R - Y)                b) R and B  
 c) I and Q                                    d) U and V
- 8) Paint programs and image editors are used for creating and editing \_\_\_\_\_.  
 a) Text                                        b) Vector images  
 c) Bitmap images                        d) HTML codes
- 9) Rooms vibrate and respond most readily to \_\_\_\_\_.  
 a) Low frequencies                      b) High frequencies  
 c) Mid frequencies                        d) None of the above

- 10)** For a sound wave relationship between velocity and temperature is given by, \_\_\_\_\_.  
 a)  $V_2 = V_1 \sqrt{T_2/T_1}$                       b)  $V_1 = V_2 \sqrt{T_2/T_1}$   
 c)  $V_2 = V_1 \sqrt{T_1/T_2}$                       d)  $V_2 = V_1 \sqrt{T/T_1}$
- 11)** The average rate of flow of sound energy through a cross-sectional area is called as \_\_\_\_\_.  
 a) Intensity of sound                      b) Vibrations of sound  
 c) Both a & b                      d) None of above
- 12)** \_\_\_\_\_ is the spectral purity of colour light.  
 a) Luminance                      b) Brightness  
 c) Hue                      d) Saturation
- 13)** The phase of the colour subcarrier burst signal in PAL system is along the axis at \_\_\_\_\_.  
 a)  $\pm 180^\circ$                       b)  $\pm 45^\circ$   
 c)  $180 \pm 45^\circ$                       d) None
- 14)** In subtractive colour theory Cyan is formed by subtracting \_\_\_\_\_.  
 a) White – Red                      b) White – Green  
 c) White – Blue                      d) None of above

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS ENGINEERING**  
**Audio Video Systems**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any four of the following question. 16**

- Define Amplitude, Frequency, Phase, and Wavelength for a sound wave.
- Write down step by step procedure for producing records.
- Discuss why FM is preferred to AM for sound signal transmission.
- Synchronizing pulses transmitted along with the picture signal justify the statement.
- How is the illusion of continuity created in television pictures? Why has the frame reception rate been chosen to be 25 and not 24 as in motion pictures?

**Q.3 Attempt any two of the following question. 12**

- If the gap width is 6 microns and the speed of tape is 4.75cm/s, calculate the maximum frequency of recording. What will happen if the tape speed is increased to 19cm/s? Comment for video frequencies.
- Discuss the factors which influence the choice of sub-carrier frequency in a colour TV system. Justify the choice of 3.579545 MHz as the subcarrier frequency in the NTSC system. How does it affect the line and field frequencies?
- Explain with a suitable block diagram the encoding process in the PAL colour system. Why is the colour burst signal transmitted after each scanning line?

**Section – II**

**Q.4 Attempt any four of the following question. 16**

- Discuss advantages of digital television.
- Explain how surround sound effect is produced in a digital TV system.
- Discuss different image data types and their file formats.
- List down different JPEG modes and discuss any one mode.
- Discuss the benefits offered by compression schemes in designing multimedia systems.

**Q.5 Attempt any two of the following question. 12**

- Draw a neat block diagram of a digital video transmitter and discuss the function of each block.
- Illustrate with a neat diagram the design for PA system for public meeting?
- Discuss bit allocation algorithm for MPEG-1 Layer 1 and Layer 2.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) \_\_\_\_\_ assumes that the presence of a particular feature in a class is unrelated to the presence of any other feature.
 

a) Decision tree	b) Regression analysis
c) Naive Bayes classifier	d) all of these
- 2) Which of below is not a data mining model?
 

a) classification	b) transformation
c) clustering	d) regression
- 3) Take the odd man out: Lp norm, Jaccard index, dynamic time warping, window-based methods
 

a) Lp norm	b) Jaccard index
c) dynamic time warping	d) window based methods
- 4) The process of \_\_\_\_\_ divides the ranges of the numeric attribute into various ranges.
 

a) binarization	b) averaging
c) histogram	d) discretization
- 5) \_\_\_\_\_ focuses on a single attribute at a time.
 

a) classification	b) univariate analysis
c) predictive clustering	d) all of these
- 6) Distance functions are highly sensitive to \_\_\_\_\_.
 

a) data distribution	b) dimensionality
c) data type	d) all of these
- 7) Take odd man out: association rule mining, decision tree, support vector machine, regression analysis.
 

a) association rule mining	b) decision tree
c) support vector machine	d) regression analysis
- 8) For which type of data an appropriate feature can be extracted using Fourier Transform?
 

a) image	b) speech
c) ECG signal	d) all of these



<b>Seat No.</b>	
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two**

**12**

- a) Predicting electricity consumption is very challenging task in a city like Solapur. The total electricity consumption depends on attributes like time of the day, season and temperature. Past data 50,000 records is available. Describe a data analytic system which can predict electricity consumption of Solapur city given the features. Give detailed steps.
- b) Bank ABC wish to buy machine learning based software to decide whether to grant a business loan to customer or not. Bank already has complete data of past 20,000 records which consists of the features/attributes and correct outcome for each record. Design a scheme to check the performance of the software to be bought based on various performance parameters. Also evaluate the Type I and type II errors associated.
- c) Data set given: 10, 8, 20, 15, 17. Normalize it to {0 to 1} and {1 to 4} using min-max normalization.

**Q.3 Solve Any Four**

**16**

- a) With suitable example compare different types of feature subset selection
- b) Compare: data science, data analytics and machine learning.
- c) With suitable example describe how mining may help in marketing of a product.
- d) With suitable example compare Euclidean distance and Manhattan distance.
- e) With suitable example show how to calculate Jaccard Index for binary set data

## Section – II

## Q.4 Solve Any Two

12

- a) Given below transaction list at a supermarket, calculate how many '3 item item-set' can be found with support >33 % and confidence >50 % using association rule mining. Also find out confidence and support for the association rule 'a person who buys bread and butter also buys milk'.

Transaction List				
1	Milk	Egg	Bread	Butter
2	Milk	Butter	Egg	Ketch up
3	Bread	Butter	Ketchup	
4	Milk	Bread	Butter	
5	Bread	Butter	Cookies	
6	Milk	Bread	Butter	Cookies
7	Milk	Cookies		
8	Milk	Bread	Butter	
9	Bread	Butter	Egg	Cookies
10	Milk	Butter	Bread	
11	Milk	Bread	Butter	
12	Milk	Bread	Cookies	Ketch up

- b) Given below training data, using linear regression analysis method
- 1) Predict price of the house with age 30 years
  - 2) Calculate residual error for house with age 15 years

Age of House (X)	Price of House (\$,000) (Y)
10	350
15	250
20	300
20	240
25	225

- c) Compare OLTP and OLAP.

## Q.5 Solve Any Four

16

- Compare supervised learning and unsupervised learning.
- What are advantages and disadvantages of K Means Clustering?
- Compare different types of data warehouse.
- With suitable example discuss dimensionality reduction using axis rotation.
- With suitable example describe star schema.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) For which type of data an appropriate feature can be extracted using Fourier Transform?
  - a) image
  - b) speech
  - c) ECG signal
  - d) all of these
- 2) Take odd man out: range, variance, mean, standard deviation.
  - a) range
  - b) variance
  - c) mean
  - d) standard deviation
- 3) Two types of collaborative filtering are \_\_\_\_\_ & \_\_\_\_\_ based.
  - a) person, people
  - b) attribute, class
  - c) supervised, unsupervised
  - d) none of these
- 4) \_\_\_\_\_ merges the data from multiple data stores.
  - a) data store merger
  - b) data warehouse
  - c) ETL
  - d) all of these
- 5) Finding number of horizontal and vertical lines from raw image data for OCR is an example of feature \_\_\_\_\_.
  - a) transformation
  - b) selection
  - c) extraction
  - d) merging
- 6) If I am collecting data based on financial status of people across the city and wish to include sufficient samples of millionaires, the sampling method used is \_\_\_\_\_ sampling.
  - a) static
  - b) biased
  - c) stratified
  - d) reservoir
- 7) Categorizing customers according to their similarities can be done using \_\_\_\_\_.
  - a) decision tree
  - b) k means clustering
  - c) logistic regression
  - d) all of these
- 8) \_\_\_\_\_ assumes that the presence of a particular feature in a class is unrelated to the presence of any other feature.
  - a) Decision tree
  - b) Regression analysis
  - c) Naive Bayes classifier
  - d) all of these





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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two**

**12**

- a) Predicting electricity consumption is very challenging task in a city like Solapur. The total electricity consumption depends on attributes like time of the day, season and temperature. Past data 50,000 records is available. Describe a data analytic system which can predict electricity consumption of Solapur city given the features. Give detailed steps.
- b) Bank ABC wish to buy machine learning based software to decide whether to grant a business loan to customer or not. Bank already has complete data of past 20,000 records which consists of the features/attributes and correct outcome for each record. Design a scheme to check the performance of the software to be bought based on various performance parameters. Also evaluate the Type I and type II errors associated.
- c) Data set given: 10, 8, 20, 15, 17. Normalize it to {0 to 1} and {1 to 4} using min-max normalization.

**Q.3 Solve Any Four**

**16**

- a) With suitable example compare different types of feature subset selection
- b) Compare: data science, data analytics and machine learning.
- c) With suitable example describe how mining may help in marketing of a product.
- d) With suitable example compare Euclidean distance and Manhattan distance.
- e) With suitable example show how to calculate Jaccard Index for binary set data

**Section – II****Q.4 Solve Any Two****12**

- a) Given below transaction list at a supermarket, calculate how many '3 item item-set' can be found with support >33 % and confidence >50 % using association rule mining. Also find out confidence and support for the association rule 'a person who buys bread and butter also buys milk'.

Transaction List				
1	Milk	Egg	Bread	Butter
2	Milk	Butter	Egg	Ketch up
3	Bread	Butter	Ketchup	
4	Milk	Bread	Butter	
5	Bread	Butter	Cookies	
6	Milk	Bread	Butter	Cookies
7	Milk	Cookies		
8	Milk	Bread	Butter	
9	Bread	Butter	Egg	Cookies
10	Milk	Butter	Bread	
11	Milk	Bread	Butter	
12	Milk	Bread	Cookies	Ketch up

- b) Given below training data, using linear regression analysis method
- 1) Predict price of the house with age 30 years
  - 2) Calculate residual error for house with age 15 years

Age of House (X)	Price of House (\$,000) (Y)
10	350
15	250
20	300
20	240
25	225

- c) Compare OLTP and OLAP.

**Q.5 Solve Any Four****16**

- a) Compare supervised learning and unsupervised learning.
- b) What are advantages and disadvantages of K Means Clustering?
- c) Compare different types of data warehouse.
- d) With suitable example discuss dimensionality reduction using axis rotation.
- e) With suitable example describe star schema.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) \_\_\_\_\_ merges the data from multiple data stores.
 

a) data store merger	b) data warehouse
c) ETL	d) all of these
- 2) Finding number of horizontal and vertical lines from raw image data for OCR is an example of feature \_\_\_\_\_.
 

a) transformation	b) selection
c) extraction	d) merging
- 3) If I am collecting data based on financial status of people across the city and wish to include sufficient samples of millionaires, the sampling method used is \_\_\_\_\_ sampling.
 

a) static	b) biased
c) stratified	d) reservoir
- 4) Categorizing customers according to their similarities can be done using \_\_\_\_\_.
 

a) decision tree	b) k means clustering
c) logistic regression	d) all of these
- 5) \_\_\_\_\_ assumes that the presence of a particular feature in a class is unrelated to the presence of any other feature.
 

a) Decision tree	b) Regression analysis
c) Naive Bayes classifier	d) all of these
- 6) Which of below is not a data mining model?
 

a) classification	b) transformation
c) clustering	d) regression
- 7) Take the odd man out: Lp norm, Jaccard index, dynamic time warping, window-based methods
 

a) Lp norm	b) Jaccard index
c) dynamic time warping	d) window based methods
- 8) The process of \_\_\_\_\_ divides the ranges of the numeric attribute into various ranges.
 

a) binarization	b) averaging
c) histogram	d) discretization

- 9) \_\_\_\_\_ focuses on a single attribute at a time.  
a) classification  
b) univariate analysis  
c) predictive clustering  
d) all of these
- 10) Distance functions are highly sensitive to \_\_\_\_\_.  
a) data distribution  
b) dimensionality  
c) data type  
d) all of these
- 11) Take odd man out: association rule mining, decision tree, support vector machine, regression analysis.  
a) association rule mining  
b) decision tree  
c) support vector machine  
d) regression analysis
- 12) For which type of data an appropriate feature can be extracted using Fourier Transform?  
a) image  
b) speech  
c) ECG signal  
d) all of these
- 13) Take odd man out: range, variance, mean, standard deviation.  
a) range  
b) variance  
c) mean  
d) standard deviation
- 14) Two types of collaborative filtering are \_\_\_\_\_ & \_\_\_\_\_ based.  
a) person, people  
b) attribute, class  
c) supervised, unsupervised  
d) none of these

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two**

**12**

- a) Predicting electricity consumption is very challenging task in a city like Solapur. The total electricity consumption depends on attributes like time of the day, season and temperature. Past data 50,000 records is available. Describe a data analytic system which can predict electricity consumption of Solapur city given the features. Give detailed steps.
- b) Bank ABC wish to buy machine learning based software to decide whether to grant a business loan to customer or not. Bank already has complete data of past 20,000 records which consists of the features/attributes and correct outcome for each record. Design a scheme to check the performance of the software to be bought based on various performance parameters. Also evaluate the Type I and type II errors associated.
- c) Data set given: 10, 8, 20, 15, 17. Normalize it to {0 to 1} and {1 to 4} using min-max normalization.

**Q.3 Solve Any Four**

**16**

- a) With suitable example compare different types of feature subset selection
- b) Compare: data science, data analytics and machine learning.
- c) With suitable example describe how mining may help in marketing of a product.
- d) With suitable example compare Euclidean distance and Manhattan distance.
- e) With suitable example show how to calculate Jaccard Index for binary set data

**Section – II****Q.4 Solve Any Two****12**

- a) Given below transaction list at a supermarket, calculate how many '3 item item-set' can be found with support >33 % and confidence >50 % using association rule mining. Also find out confidence and support for the association rule 'a person who buys bread and butter also buys milk'.

Transaction List				
1	Milk	Egg	Bread	Butter
2	Milk	Butter	Egg	Ketch up
3	Bread	Butter	Ketchup	
4	Milk	Bread	Butter	
5	Bread	Butter	Cookies	
6	Milk	Bread	Butter	Cookies
7	Milk	Cookies		
8	Milk	Bread	Butter	
9	Bread	Butter	Egg	Cookies
10	Milk	Butter	Bread	
11	Milk	Bread	Butter	
12	Milk	Bread	Cookies	Ketch up

- b) Given below training data, using linear regression analysis method
- 1) Predict price of the house with age 30 years
  - 2) Calculate residual error for house with age 15 years

Age of House (X)	Price of House (\$,000) (Y)
10	350
15	250
20	300
20	240
25	225

- c) Compare OLTP and OLAP.

**Q.5 Solve Any Four****16**

- a) Compare supervised learning and unsupervised learning.
- b) What are advantages and disadvantages of K Means Clustering?
- c) Compare different types of data warehouse.
- d) With suitable example discuss dimensionality reduction using axis rotation.
- e) With suitable example describe star schema.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Distance functions are highly sensitive to \_\_\_\_\_.  
 a) data distribution                      b) dimensionality  
 c) data type                                  d) all of these
- 2) Take odd man out: association rule mining, decision tree, support vector machine, regression analysis.  
 a) association rule mining                  b) decision tree  
 c) support vector machine                  d) regression analysis
- 3) For which type of data an appropriate feature can be extracted using Fourier Transform?  
 a) image    b) speech  
 c) ECG signal                                  d) all of these
- 4) Take odd man out: range, variance, mean, standard deviation.  
 a) range    b) variance  
 c) mean    d) standard deviation
- 5) Two types of collaborative filtering are \_\_\_\_\_ & \_\_\_\_\_ based.  
 a) person, people                              b) attribute, class  
 c) supervised, unsupervised              d) none of these
- 6) \_\_\_\_\_ merges the data from multiple data stores.  
 a) data store merger                          b) data warehouse  
 c) ETL    d) all of these
- 7) Finding number of horizontal and vertical lines from raw image data for OCR is an example of feature \_\_\_\_\_.  
 a) transformation                              b) selection  
 c) extraction                                      d) merging
- 8) If I am collecting data based on financial status of people across the city and wish to include sufficient samples of millionaires, the sampling method used is \_\_\_\_\_ sampling.  
 a) static    b) biased  
 c) stratified    d) reservoir



- 9) Categorizing customers according to their similarities can be done using \_\_\_\_.
- a) decision tree
  - b) k means clustering
  - c) logistic regression
  - d) all of these
- 10) \_\_\_\_\_ assumes that the presence of a particular feature in a class is unrelated to the presence of any other feature.
- a) Decision tree
  - b) Regression analysis
  - c) Naive Bayes classifier
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- 11) Which of below is not a data mining model?
- a) classification
  - b) transformation
  - c) clustering
  - d) regression
- 12) Take the odd man out: Lp norm, Jaccord index, dynamic time warping, window-based methods
- a) Lp norm
  - b) Jaccord index
  - c) dynamic time warping
  - d) window based methods
- 13) The process of \_\_\_\_\_ divides the ranges of the numeric attribute into various ranges.
- a) binarization
  - b) averaging
  - c) histogram
  - d) discretization
- 14) \_\_\_\_\_ focuses on a single attribute at a time.
- a) classification
  - b) univariate analysis
  - c) predictive clustering
  - d) all of these

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two**

**12**

- a) Predicting electricity consumption is very challenging task in a city like Solapur. The total electricity consumption depends on attributes like time of the day, season and temperature. Past data 50,000 records is available. Describe a data analytic system which can predict electricity consumption of Solapur city given the features. Give detailed steps.
- b) Bank ABC wish to buy machine learning based software to decide whether to grant a business loan to customer or not. Bank already has complete data of past 20,000 records which consists of the features/attributes and correct outcome for each record. Design a scheme to check the performance of the software to be bought based on various performance parameters. Also evaluate the Type I and type II errors associated.
- c) Data set given: 10, 8, 20, 15, 17. Normalize it to {0 to 1} and {1 to 4} using min-max normalization.

**Q.3 Solve Any Four**

**16**

- a) With suitable example compare different types of feature subset selection
- b) Compare: data science, data analytics and machine learning.
- c) With suitable example describe how mining may help in marketing of a product.
- d) With suitable example compare Euclidean distance and Manhattan distance.
- e) With suitable example show how to calculate Jaccard Index for binary set data

## Section – II

## Q.4 Solve Any Two

12

- a) Given below transaction list at a supermarket, calculate how many '3 item item-set' can be found with support >33 % and confidence >50 % using association rule mining. Also find out confidence and support for the association rule 'a person who buys bread and butter also buys milk'.

Transaction List				
1	Milk	Egg	Bread	Butter
2	Milk	Butter	Egg	Ketch up
3	Bread	Butter	Ketchup	
4	Milk	Bread	Butter	
5	Bread	Butter	Cookies	
6	Milk	Bread	Butter	Cookies
7	Milk	Cookies		
8	Milk	Bread	Butter	
9	Bread	Butter	Egg	Cookies
10	Milk	Butter	Bread	
11	Milk	Bread	Butter	
12	Milk	Bread	Cookies	Ketch up

- b) Given below training data, using linear regression analysis method
- 1) Predict price of the house with age 30 years
  - 2) Calculate residual error for house with age 15 years

Age of House (X)	Price of House (\$,000) (Y)
10	350
15	250
20	300
20	240
25	225

- c) Compare OLTP and OLAP.

## Q.5 Solve Any Four

16

- Compare supervised learning and unsupervised learning.
- What are advantages and disadvantages of K Means Clustering?
- Compare different types of data warehouse.
- With suitable example discuss dimensionality reduction using axis rotation.
- With suitable example describe star schema.

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC ENGINEERING**  
**Computer Architecture**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Computer architecture deals with \_\_\_\_\_.  
 a) The sizes of data types that are supported.  
 b) The sizes of data types and the types of operations that are supported  
 c) The types of operations  
 d) Interfaces to peripheral devices
- 2) In memory-mapped I/O \_\_\_\_\_.  
 a) The I/O devices and the memory share the same address space  
 b) The I/O devices have a separate address space  
 c) The memory and I/O devices have an associated address space  
 d) A part of the memory is specifically set aside for the I/O operation
- 3) The advantage of I/O mapped devices to memory mapped is \_\_\_\_\_.  
 a) The former offers faster transfer of data  
 b) The devices connected using I/O mapping have a bigger buffer space  
 c) The devices have to deal with fewer address lines  
 d) No advantage as such
- 4) The method of accessing the I/O devices by repeatedly checking the status flags is \_\_\_\_\_.  
 a) Program-controlled I/O                      b) Memory-mapped I/O  
 c) I/O mapped                                      d) Interrupt driven I/O
- 5) Which of the following is a type of architecture used in the computers nowadays?  
 a) Micro architecture                      b) Harvard Architecture  
 c) Von-Neumann Architecture              d) System Design
- 6) If the decimal point is placed to the right of the first significant digit, then the number is called \_\_\_\_\_.  
 a) Orthogonal                                      b) Normalized  
 c) Determinate                                    d) None of the mentioned
- 7) \_\_\_\_\_ constitute the representation of the floating number.  
 a) Sign digit                                      b) Significant digits  
 c) Exponent digits                              d) All of the mentioned

- Page 2 of 12

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC ENGINEERING**  
**Computer Architecture**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Solve any four** **16**
- a) Explain the levels of machines in the computer hierarchy.
  - b) Explain fixed point number representation in detail.
  - c) Convert  $(23.375)_{10}$  to base 2 number.
  - d) Explain hardware components of instruction set architecture.
  - e) Draw and explain functional behavior of RAM cell.
- Q.3 Solve any two** **12**
- a) Explain IEEE 754 standard format used to store floating point number in memory.
  - b) What is fetch execute cycle? Draw and explain an example of data path.
  - c) Explain methods for managing the IO devices.

**Section – II**

- Q.4 Solve any four** **16**
- a) Explain main stream classes of computing environment.
  - b) Explain the classes of parallelism and parallel architecture.
  - c) Explain basic compiler techniques for exposing instruction level parallelism.
  - d) Draw and explain basic structure of centralized shared memory multiprocessor based on multi core chip.
  - e) Explain hardware-based speculation.
- Q.5 Solve any two** **12**
- a) Explain the impact of time, volume, commoditization on a cost of computing system.
  - b) Explain challenges of parallel processing.
  - c) Explain basic schemes for enforcing coherence.

<b>Seat No.</b>	
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- 9) In memory-mapped I/O \_\_\_\_\_.  
a) The I/O devices and the memory share the same address space  
b) The I/O devices have a separate address space  
c) The memory and I/O devices have an associated address space  
d) A part of the memory is specifically set aside for the I/O operation
- 10) The advantage of I/O mapped devices to memory mapped is \_\_\_\_\_.  
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b) The devices connected using I/O mapping have a bigger buffer space  
c) The devices have to deal with fewer address lines  
d) No advantage as such
- 11) The method of accessing the I/O devices by repeatedly checking the status flags is \_\_\_\_\_.  
a) Program-controlled I/O                      b) Memory-mapped I/O  
c) I/O mapped                                      d) Interrupt driven I/O
- 12) Which of the following is a type of architecture used in the computers nowadays?  
a) Micro architecture                      b) Harvard Architecture  
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- 13) If the decimal point is placed to the right of the first significant digit, then the number is called \_\_\_\_\_.  
a) Orthogonal                                      b) Normalized  
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- 14) \_\_\_\_\_ constitute the representation of the floating number.  
a) Sign digit                                      b) Significant digits  
c) Exponent digits                                      d) All of the mentioned



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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC ENGINEERING**  
**Computer Architecture**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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**Section – I**

- Q.2 Solve any four** **16**
- a) Explain the levels of machines in the computer hierarchy.
  - b) Explain fixed point number representation in detail.
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- a) Explain IEEE 754 standard format used to store floating point number in memory.
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**Section – II**

- Q.4 Solve any four** **16**
- a) Explain main stream classes of computing environment.
  - b) Explain the classes of parallelism and parallel architecture.
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- a) Explain the impact of time, volume, commoditization on a cost of computing system.
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  - c) Explain basic schemes for enforcing coherence.

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- 8) The method of accessing the I/O devices by repeatedly checking the status flags is \_\_\_\_\_.  
a) Program-controlled I/O                      b) Memory-mapped I/O  
c) I/O mapped                                      d) Interrupt driven I/O
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a) Micro architecture                      b) Harvard Architecture  
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a) Orthogonal                                      b) Normalized  
c) Determinate                                      d) None of the mentioned
- 11) \_\_\_\_\_ constitute the representation of the floating number.  
a) Sign digit                                      b) Significant digits  
c) Exponent digits                                      d) All of the mentioned
- 12) Execution of several activities at the same time \_\_\_\_\_.  
a) processing                                      b) parallel processing  
c) serial processing                                      d) multitasking
- 13) A term for simultaneous access to a resource, physical or logical \_\_\_\_\_.  
a) Multiprogramming                      b) Multitasking  
c) Threads                                      d) Concurrency
- 14) \_\_\_\_\_ leads to concurrency.  
a) Serialization                                      b) Parallelism  
c) Serial processing                                      d) Distribution

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC ENGINEERING**  
**Computer Architecture**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Solve any four** **16**
- a) Explain the levels of machines in the computer hierarchy.
  - b) Explain fixed point number representation in detail.
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- a) Explain IEEE 754 standard format used to store floating point number in memory.
  - b) What is fetch execute cycle? Draw and explain an example of data path.
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**Section – II**

- Q.4 Solve any four** **16**
- a) Explain main stream classes of computing environment.
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  - c) Explain basic compiler techniques for exposing instruction level parallelism.
  - d) Draw and explain basic structure of centralized shared memory multiprocessor based on multi core chip.
  - e) Explain hardware-based speculation.
- Q.5 Solve any two** **12**
- a) Explain the impact of time, volume, commoditization on a cost of computing system.
  - b) Explain challenges of parallel processing.
  - c) Explain basic schemes for enforcing coherence.

Max. Marks: 70

- 10) Computer architecture deals with \_\_\_\_\_.  
a) The sizes of data types that are supported.  
b) The sizes of data types and the types of operations that are supported  
c) The types of operations  
d) Interfaces to peripheral devices
- 11) In memory-mapped I/O \_\_\_\_\_.  
a) The I/O devices and the memory share the same address space  
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c) The devices have to deal with fewer address lines  
d) No advantage as such
- 13) The method of accessing the I/O devices by repeatedly checking the status flags is \_\_\_\_\_.  
a) Program-controlled I/O                      b) Memory-mapped I/O  
c) I/O mapped                                      d) Interrupt driven I/O
- 14) Which of the following is a type of architecture used in the computers nowadays?  
a) Micro architecture                      b) Harvard Architecture  
c) Von-Neumann Architecture              d) System Design

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC ENGINEERING**  
**Computer Architecture**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Solve any four** **16**
- a) Explain the levels of machines in the computer hierarchy.
  - b) Explain fixed point number representation in detail.
  - c) Convert  $(23.375)_{10}$  to base 2 number.
  - d) Explain hardware components of instruction set architecture.
  - e) Draw and explain functional behavior of RAM cell.
- Q.3 Solve any two** **12**
- a) Explain IEEE 754 standard format used to store floating point number in memory.
  - b) What is fetch execute cycle? Draw and explain an example of data path.
  - c) Explain methods for managing the IO devices.

**Section – II**

- Q.4 Solve any four** **16**
- a) Explain main stream classes of computing environment.
  - b) Explain the classes of parallelism and parallel architecture.
  - c) Explain basic compiler techniques for exposing instruction level parallelism.
  - d) Draw and explain basic structure of centralized shared memory multiprocessor based on multi core chip.
  - e) Explain hardware-based speculation.
- Q.5 Solve any two** **12**
- a) Explain the impact of time, volume, commoditization on a cost of computing system.
  - b) Explain challenges of parallel processing.
  - c) Explain basic schemes for enforcing coherence.

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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The application/applications of Artificial Intelligence is/are
  - a) Expert Systems
  - b) Gaming
  - c) Vision System
  - d) All of these
- 2) Rational agent always does the right thing.
  - a) True
  - b) False
  - c) Either true or false
  - d) None of the above
- 3) Which of the following machines requires input from the humans but can interpret the outputs themselves?
  - a) Actuators
  - b) Sensor
  - c) Agents
  - d) AI system
- 4) In state-space, the set of actions for a given problem is expressed by the \_\_\_\_\_.
  - a) Intermediate States
  - b) Successor function that takes current action and returns next state
  - c) Initial States
  - d) None of the above
- 5) Consider the problem of preparing a schedule for a class of students. What type of problem is this?
  - a) Search Problem
  - b) Backtrack Problem
  - c) Constraint Satisfaction Problem
  - d) Planning Problem
- 6) First Order Logic is also known as \_\_\_\_\_.
  - a) Propositional Logic
  - b) Predicate Logic
  - c) Description Logic
  - d) None of the above



- 7) If according to the hypothesis, the result should be positive, but in fact it is negative, then it is known as \_\_\_\_\_.  
a) False Negative Hypothesis      b) False Positive Hypothesis  
c) Specialized Hypothesis      d) Consistent Hypothesis
- 8) Where does the Bayes rule can be used?  
a) Solving queries      b) Increasing complexity  
c) Decreasing complexity      d) Answering probabilistic query
- 9) A Bayesian network is a probabilistic graphical model that represents a set of variables and their conditional dependencies via \_\_\_\_\_.  
a) Directed acyclic graph      b) Cyclic graph  
c) Undirected graph      d) Linear graph
- 10) Which is true for Decision theory?  
a) Decision Theory = Probability theory + utility theory  
b) Decision Theory = Inference theory + utility theory  
c) Decision Theory = Uncertainty + utility theory  
d) Decision Theory = Probability theory + preference
- 11) There are various types of game models, which are based on  
a) The number of players participating  
b) The sum of gains or losses  
c) Both of the above  
d) None of the above
- 12) Which of the following is/are types of Machine Learning there?  
a) Supervised Learning      b) Unsupervised Learning  
c) Reinforcement Learning      d) All of the above
- 13) \_\_\_\_\_ reinforcement occurs due to a particular behavior, increasing the strength and the frequency of the behavior while \_\_\_\_\_ reinforcement is strengthening of a behavior because a negative condition is stopped or avoided.  
a) Positive, Positive      b) Negative, Negative  
c) Positive, Negative      d) Negative, Positive
- 14) Artificial Intelligence shares many concepts with \_\_\_\_\_ e.g. action, consciousness, epistemology, and even free will.  
a) Psychology      b) Philosophy  
c) Mentality      d) None of the above

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section - I**

- Q.2 Attempt any Three of the following. 12**
- a) Elaborate all the areas of scope for Artificial Intelligence.
  - b) Discuss the blind search algorithms and explain which is the best algorithm in them.
  - c) Explain A\* algorithm.
  - d) Write a note on reasoning with defaults
- Q.3 Attempt any Two of the following 16**
- a) Explain working of Minimax algorithm with the example. Elaborate properties and limitations of Minimax algorithm.
  - b) Write the note on first order logic. Explain with the example.
  - c) Write a note on Intelligent agents and their types with the example

**Section - II**

- Q.4 Attempt Any Three of the following. 12**
- a) Write a note on utility theory.
  - b) What are the types of algorithms used in supervised learning? Elaborate each of them.
  - c) Explain Q learning.
  - d) Write a case study on the past, present and future of AI.
- Q.5 Attempt Any Two of the following 16**
- a) Explain Bayes rule. What is the Bayesian network? Explain with examples.
  - b) Write a note on decision theory. Explain Markov decision process.
  - c) Differentiate between supervised learning and unsupervised learning. How is semi-supervised learning a mixture of these two?

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Where does the bayes rule can be used?
  - a) Solving queries
  - b) Increasing complexity
  - c) Decreasing complexity
  - d) Answering probabilistic query
- 2) A Bayesian network is a probabilistic graphical model that represents a set of variables and their conditional dependencies via \_\_\_\_\_.
  - a) Directed acyclic graph
  - b) Cyclic graph
  - c) Undirected graph
  - d) Linear graph
- 3) Which is true for Decision theory?
  - a) Decision Theory = Probability theory + utility theory
  - b) Decision Theory = Inference theory + utility theory
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- 4) There are various types of game models, which are based on
  - a) The number of players participating
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  - c) Both of the above
  - d) None of the above
- 5) Which of the following is/are types of Machine Learning there?
  - a) Supervised Learning
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- 6) \_\_\_\_\_ reinforcement occurs due to a particular behavior, increasing the strength and the frequency of the behavior while \_\_\_\_\_ reinforcement is strengthening of a behavior because a negative condition is stopped or avoided.
  - a) Positive, Positive
  - b) Negative, Negative
  - c) Positive, Negative
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- 7) Artificial Intelligence shares many concepts with \_\_\_\_\_ e.g. action, consciousness, epistemology, and even free will.
  - a) Psychology
  - b) Philosophy
  - c) Mentality
  - d) None of the above

- 8) The application/applications of Artificial Intelligence is/are
  - a) Expert Systems
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- 12) Consider the problem of preparing a schedule for a class of students. What type of problem is this?
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- 13) First Order Logic is also known as \_\_\_\_\_.
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- 14) If according to the hypothesis, the result should be positive, but in fact it is negative, then it is known as \_\_\_\_\_.
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<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section - I**

**Q.2 Attempt any Three of the following. 12**

- a) Elaborate all the areas of scope for Artificial Intelligence.
- b) Discuss the blind search algorithms and explain which is the best algorithm in them.
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**Q.3 Attempt any Two of the following 16**

- a) Explain working of Minimax algorithm with the example. Elaborate properties and limitations of Minimax algorithm.
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- c) Write a note on Intelligent agents and their types with the example

**Section - II**

**Q.4 Attempt Any Three of the following. 12**

- a) Write a note on utility theory.
- b) What are the types of algorithms used in supervised learning? Elaborate each of them.
- c) Explain Q learning.
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**Q.5 Attempt Any Two of the following 16**

- a) Explain Bayes rule. What is the Bayesian network? Explain with examples.
- b) Write a note on decision theory. Explain Markov decision process.
- c) Differentiate between supervised learning and unsupervised learning. How is semi-supervised learning a mixture of these two?

Seat No.	
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) There are various types of game models, which are based on
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- 14) Which is true for Decision theory?  
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c) Decision Theory = Uncertainty + utility theory  
d) Decision Theory = Probability theory + preference

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Three of the following. 12**

- a) Elaborate all the areas of scope for Artificial Intelligence.
- b) Discuss the blind search algorithms and explain which is the best algorithm in them.
- c) Explain A\* algorithm.
- d) Write a note on reasoning with defaults

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- a) Explain working of Minimax algorithm with the example. Elaborate properties and limitations of Minimax algorithm.
- b) Write the note on first order logic. Explain with the example.
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**Section - II**

**Q.4 Attempt Any Three of the following. 12**

- a) Write a note on utility theory.
- b) What are the types of algorithms used in supervised learning? Elaborate each of them.
- c) Explain Q learning.
- d) Write a case study on the past, present and future of AI.

**Q.5 Attempt Any Two of the following 16**

- a) Explain Bayes rule. What is the Bayesian network? Explain with examples.
- b) Write a note on decision theory. Explain Markov decision process.
- c) Differentiate between supervised learning and unsupervised learning. How is semi-supervised learning a mixture of these two?



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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) First Order Logic is also known as \_\_\_\_\_.
  - a) Propositional Logic
  - b) Predicate Logic
  - c) Description Logic
  - d) None of the above
- 2) If according to the hypothesis, the result should be positive, but in fact it is negative, then it is known as \_\_\_\_\_.
  - a) False Negative Hypothesis
  - b) False Positive Hypothesis
  - c) Specialized Hypothesis
  - d) Consistent Hypothesis
- 3) Where does the bayes rule can be used?
  - a) Solving queries
  - b) Increasing complexity
  - c) Decreasing complexity
  - d) Answering probabilistic query
- 4) A Bayesian network is a probabilistic graphical model that represents a set of variables and their conditional dependencies via \_\_\_\_\_.
  - a) Directed acyclic graph
  - b) Cyclic graph
  - c) Undirected graph
  - d) Linear graph
- 5) Which is true for Decision theory?
  - a) Decision Theory = Probability theory + utility theory
  - b) Decision Theory = Inference theory + utility theory
  - c) Decision Theory = Uncertainty + utility theory
  - d) Decision Theory = Probability theory + preference
- 6) There are various types of game models, which are based on
  - a) The number of players participating
  - b) The sum of gains or losses
  - c) Both of the above
  - d) None of the above
- 7) Which of the following is/are types of Machine Learning there?
  - a) Supervised Learning
  - b) Unsupervised Learning
  - c) Reinforcement Learning
  - d) All of the above

- 8) \_\_\_\_\_ reinforcement occurs due to a particular behavior, increasing the strength and the frequency of the behavior while \_\_\_\_\_ reinforcement is strengthening of a behavior because a negative condition is stopped or avoided.
- a) Positive, Positive
  - b) Negative, Negative
  - c) Positive, Negative
  - d) Negative, Positive
- 9) Artificial Intelligence shares many concepts with \_\_\_\_\_ e.g. action, consciousness, epistemology, and even free will.
- a) Psychology
  - b) Philosophy
  - c) Mentality
  - d) None of the above
- 10) The application/applications of Artificial Intelligence is/are
- a) Expert Systems
  - b) Gaming
  - c) Vision System
  - d) All of these
- 11) Rational agent always does the right thing.
- a) True
  - b) False
  - c) Either true or false
  - d) None of the above
- 12) Which of the following machines requires input from the humans but can interpret the outputs themselves?
- a) Actuators
  - b) Sensor
  - c) Agents
  - d) AI system
- 13) In state-space, the set of actions for a given problem is expressed by the\_\_\_\_\_.
- a) Intermediate States
  - b) Successor function that takes current action and returns next state
  - c) Initial States
  - d) None of the above
- 14) Consider the problem of preparing a schedule for a class of students. What type of problem is this?
- a) Search Problem
  - b) Backtrack Problem
  - c) Constraint Satisfaction Problem
  - d) Planning Problem

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Three of the following. 12**

- a) Elaborate all the areas of scope for Artificial Intelligence.
- b) Discuss the blind search algorithms and explain which is the best algorithm in them.
- c) Explain A\* algorithm.
- d) Write a note on reasoning with defaults

**Q.3 Attempt any Two of the following 16**

- a) Explain working of Minimax algorithm with the example. Elaborate properties and limitations of Minimax algorithm.
- b) Write the note on first order logic. Explain with the example.
- c) Write a note on Intelligent agents and their types with the example

**Section - II**

**Q.4 Attempt Any Three of the following. 12**

- a) Write a note on utility theory.
- b) What are the types of algorithms used in supervised learning? Elaborate each of them.
- c) Explain Q learning.
- d) Write a case study on the past, present and future of AI.

**Q.5 Attempt Any Two of the following 16**

- a) Explain Bayes rule. What is the Bayesian network? Explain with examples.
- b) Write a note on decision theory. Explain Markov decision process.
- c) Differentiate between supervised learning and unsupervised learning. How is semi-supervised learning a mixture of these two?

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Set

P

**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The state of a process is defined by \_\_\_\_\_.  
 a) the final activity of the process  
 b) the activity just executed by the process  
 c) next activity to be executed by the process  
 d) the current activity of the process
- 2) A solution to the problem of external fragmentation is \_\_\_\_\_.  
 a) compaction  
 b) larger memory space  
 c) smaller memory space  
 d) none of the mentioned
- 3) SPOOLING stands for \_\_\_\_\_.  
 a) Spontaneous primary operation online  
 b) Simultaneous peripheral operation online  
 c) Small peripheral operation online  
 d) None of these
- 4) The PCB of a process does not contain \_\_\_\_\_.  
 a) The value of the cpu registers  
 b) The process state  
 c) Memory management information  
 d) Context switch time
- 5) Process synchronization can be done at \_\_\_\_\_.  
 a) Hardware level  
 b) Software level  
 c) Both a) and b)  
 d) None of these
- 6) Which of the following do not belong to queues for processes?  
 a) Job queue  
 b) PCB queue  
 c) Device queue  
 d) Ready queue
- 7) Which of the following page replacement algorithms suffers from Belady's Anomaly  
 a) Optimal replacement  
 b) LRU  
 c) FIFO  
 d) Both optimal replacement and FIFO

- 8) Time quantum is defined in \_\_\_\_\_.  
a) SJF scheduling algorithm      b) FCFS scheduling algorithm  
c) RR scheduling algorithm      d) Priority scheduling algorithm
- 9) A solution to the critical section problem must satisfy which of the following condition?  
a) Mutual exclusion      b) Progress  
c) Bounded waiting      d) All of these
- 10) Which of the following is a synchronization tool?  
a) Pipe      b) Semaphore  
c) Socket      d) Thread
- 11) Which of the following is the address generated by CPU?  
a) Physical address      b) Absolute address  
c) Logical address      d) None of the above
- 12) Effective access time is directly proportional to \_\_\_\_\_.  
a) page fault rate      b) hit ratio  
c) memory access time      d) none of the mentioned
- 13) Which one of the following is the deadlock avoidance algorithm?  
a) Banker's algorithm      b) Round-robin algorithm  
c) Elevator algorithm      d) Karn's algorithm
- 14) The number of processes completed per unit time is known as \_\_\_\_\_.  
a) Output      b) Throughput  
c) Efficiency      d) Capacity

Seat No.	
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Set

P

**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any three (Each carries 4 marks) 12**

- Explain PCB with example.
- What is the major problem in Priority Scheduling? And how to solve it?
- What is a Semaphore? Explain its operations.
- What is spooling? Explain with example.

**Q.3 Attempt any two (Each carries 8 marks) 16**

- What is process scheduler? Describe long term, short term and medium term scheduler in detail.
- Consider the following set of processes, with the length of the cpu burst time given in milliseconds,

Process	Burst Time
P1	10
P2	1
P3	2
P4	1
P5	5

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0. Answer the following.

- Draw Gantt charts that illustrate the execution of these processes using FCFS and SJF - non preemptive.
  - What is average waiting time for both are scheduling algorithms in part (i)?
  - What is average turnaround time for both are scheduling algorithms in part (i)?
  - Which scheduling algorithm results in minimal average waiting time (over all process)?
- Represent waiting time and turnaround time for all processes in table.
- Explain classical problems of Synchronization in terms of Dining Philosopher problem.

**Section – II**

**Q.4 Attempt any three (Each carries 4 marks) 12**

- Explain the steps for page fault handling.
- Explain four essential conditions for the occurrence of deadlock.
- Explain swapping mechanism in paging.
- Write a note on DMA.

**Q.5 Attempt any two (Each carries 8 marks)**

- a) Explain deadlock prevention technique in detail.
- b) Let there be five processes (P1 to P5) and three resource types A, B and C. Resource type A has 10 instances. Resource type B has 5 instances. Resource type C has 7 instances. Suppose that at time,  $t_0$ , the following snapshot of the system has been taken:

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

- i) What is the content of need matrix?
- ii) Find the safe sequence. Is this system safe at time  $t_0$ ?
- iii) If process, P2 sends one additional request, can it be granted? Say P2 send the request of (1,0,2).
- c) Explain Paging in detail.

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Set Q
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Time quantum is defined in \_\_\_\_\_.  
 a) SJF scheduling algorithm                      b) FCFS scheduling algorithm  
 c) RR scheduling algorithm                      d) Priority scheduling algorithm
- 2) A solution to the critical section problem must satisfy which of the following condition?  
 a) Mutual exclusion                                      b) Progress  
 c) Bounded waiting                                      d) All of these
- 3) Which of the following is a synchronization tool?  
 a) Pipe    b) Semaphore  
 c) Socket    d) Thread
- 4) Which of the following is the address generated by CPU?  
 a) Physical address                                      b) Absolute address  
 c) Logical address                                      d) None of the above
- 5) Effective access time is directly proportional to \_\_\_\_\_.  
 a) page fault rate                                      b) hit ratio  
 c) memory access time                                      d) none of the mentioned
- 6) Which one of the following is the deadlock avoidance algorithm?  
 a) Banker's algorithm                                      b) Round-robin algorithm  
 c) Elevator algorithm                                      d) Karn's algorithm
- 7) The number of processes completed per unit time is known as \_\_\_\_\_.  
 a) Output    b) Throughput  
 c) Efficiency    d) Capacity
- 8) The state of a process is defined by \_\_\_\_\_.  
 a) the final activity of the process  
 b) the activity just executed by the process  
 c) next activity to be executed by the process  
 d) the current activity of the process





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Set Q
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any three (Each carries 4 marks) 12**

- Explain PCB with example.
- What is the major problem in Priority Scheduling? And how to solve it?
- What is a Semaphore? Explain its operations.
- What is spooling? Explain with example.

**Q.3 Attempt any two (Each carries 8 marks) 16**

- What is process scheduler? Describe long term, short term and medium term scheduler in detail.
- Consider the following set of processes, with the length of the cpu burst time given in milliseconds,

Process	Burst Time
P1	10
P2	1
P3	2
P4	1
P5	5

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0. Answer the following.

- Draw Gantt charts that illustrate the execution of these processes using FCFS and SJF - non preemptive.
  - What is average waiting time for both are scheduling algorithms in part (i)?
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  - Which scheduling algorithm results in minimal average waiting time (over all process)?
- Represent waiting time and turnaround time for all processes in table.
- Explain classical problems of Synchronization in terms of Dining Philosopher problem.

**Section – II**

**Q.4 Attempt any three (Each carries 4 marks) 12**

- Explain the steps for page fault handling.
- Explain four essential conditions for the occurrence of deadlock.
- Explain swapping mechanism in paging.
- Write a note on DMA.

**Q.5 Attempt any two (Each carries 8 marks)**

- a) Explain deadlock prevention technique in detail.
- b) Let there be five processes (P1 to P5) and three resource types A, B and C. Resource type A has 10 instances. Resource type B has 5 instances. Resource type C has 7 instances. Suppose that at time,  $t_0$ , the following snapshot of the system has been taken:

	Allocation			Max			Available		
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P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

- i) What is the content of need matrix?
- ii) Find the safe sequence. Is this system safe at time  $t_0$ ?
- iii) If process, P2 sends one additional request, can it be granted? Say P2 send the request of (1,0,2).
- c) Explain Paging in detail.

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is the address generated by CPU?
  - a) Physical address
  - b) Absolute address
  - c) Logical address
  - d) None of the above
- 2) Effective access time is directly proportional to \_\_\_\_\_.
  - a) page fault rate
  - b) hit ratio
  - c) memory access time
  - d) none of the mentioned
- 3) Which one of the following is the deadlock avoidance algorithm?
  - a) Banker's algorithm
  - b) Round-robin algorithm
  - c) Elevator algorithm
  - d) Karn's algorithm
- 4) The number of processes completed per unit time is known as \_\_\_\_\_.
  - a) Output
  - b) Throughput
  - c) Efficiency
  - d) Capacity
- 5) The state of a process is defined by \_\_\_\_\_.
  - a) the final activity of the process
  - b) the activity just executed by the process
  - c) next activity to be executed by the process
  - d) the current activity of the process
- 6) A solution to the problem of external fragmentation is \_\_\_\_\_.
  - a) compaction
  - b) larger memory space
  - c) smaller memory space
  - d) none of the mentioned
- 7) SPOOLING stands for \_\_\_\_\_.
  - a) Spontaneous primary operation online
  - b) Simultaneous peripheral operation online
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  - d) None of these
- 8) The PCB of a process does not contain \_\_\_\_\_.
  - a) The value of the cpu registers
  - b) The process state
  - c) Memory management information
  - d) Context switch time

- 9) Process synchronization can be done at \_\_\_\_\_.
  - a) Hardware level
  - b) Software level
  - c) Both a) and b)
  - d) None of these
- 10) Which of the following do not belong to queues for processes?
  - a) Job queue
  - b) PCB queue
  - c) Device queue
  - d) Ready queue
- 11) Which of the following page replacement algorithms suffers from Belady's Anomaly
  - a) Optimal replacement
  - b) LRU
  - c) FIFO
  - d) Both optimal replacement and FIFO
- 12) Time quantum is defined in \_\_\_\_\_.
  - a) SJF scheduling algorithm
  - b) FCFS scheduling algorithm
  - c) RR scheduling algorithm
  - d) Priority scheduling algorithm
- 13) A solution to the critical section problem must satisfy which of the following condition?
  - a) Mutual exclusion
  - b) Progress
  - c) Bounded waiting
  - d) All of these
- 14) Which of the following is a synchronization tool?
  - a) Pipe
  - b) Semaphore
  - c) Socket
  - d) Thread

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any three (Each carries 4 marks) 12**

- Explain PCB with example.
- What is the major problem in Priority Scheduling? And how to solve it?
- What is a Semaphore? Explain its operations.
- What is spooling? Explain with example.

**Q.3 Attempt any two (Each carries 8 marks) 16**

- What is process scheduler? Describe long term, short term and medium term scheduler in detail.
- Consider the following set of processes, with the length of the cpu burst time given in milliseconds,

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- Represent waiting time and turnaround time for all processes in table.
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**Section – II**

**Q.4 Attempt any three (Each carries 4 marks) 12**

- Explain the steps for page fault handling.
- Explain four essential conditions for the occurrence of deadlock.
- Explain swapping mechanism in paging.
- Write a note on DMA.

**Q.5 Attempt any two (Each carries 8 marks)**

- a) Explain deadlock prevention technique in detail.
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P5	0	0	2	4	3	3			

- i) What is the content of need matrix?
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- iii) If process, P2 sends one additional request, can it be granted? Say P2 send the request of (1,0,2).
- c) Explain Paging in detail.

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
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  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following do not belong to queues for processes?
  - a) Job queue
  - b) PCB queue
  - c) Device queue
  - d) Ready queue
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- 3) Time quantum is defined in \_\_\_\_\_.
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  - b) FCFS scheduling algorithm
  - c) RR scheduling algorithm
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- 4) A solution to the critical section problem must satisfy which of the following condition?
  - a) Mutual exclusion
  - b) Progress
  - c) Bounded waiting
  - d) All of these
- 5) Which of the following is a synchronization tool?
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  - b) Semaphore
  - c) Socket
  - d) Thread
- 6) Which of the following is the address generated by CPU?
  - a) Physical address
  - b) Absolute address
  - c) Logical address
  - d) None of the above
- 7) Effective access time is directly proportional to \_\_\_\_\_.
  - a) page fault rate
  - b) hit ratio
  - c) memory access time
  - d) none of the mentioned
- 8) Which one of the following is the deadlock avoidance algorithm?
  - a) Banker's algorithm
  - b) Round-robin algorithm
  - c) Elevator algorithm
  - d) Karn's algorithm



- 9) The number of processes completed per unit time is known as \_\_\_\_\_.
  - a) Output
  - b) Throughput
  - c) Efficiency
  - d) Capacity
- 10) The state of a process is defined by \_\_\_\_\_.
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  - c) next activity to be executed by the process
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  - d) Context switch time
- 14) Process synchronization can be done at \_\_\_\_\_.
  - a) Hardware level
  - b) Software level
  - c) Both a) and b)
  - d) None of these

Seat No.	
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Set	S
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any three (Each carries 4 marks) 12**

- Explain PCB with example.
- What is the major problem in Priority Scheduling? And how to solve it?
- What is a Semaphore? Explain its operations.
- What is spooling? Explain with example.

**Q.3 Attempt any two (Each carries 8 marks) 16**

- What is process scheduler? Describe long term, short term and medium term scheduler in detail.
- Consider the following set of processes, with the length of the cpu burst time given in milliseconds,

Process	Burst Time
P1	10
P2	1
P3	2
P4	1
P5	5

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0. Answer the following.

- Draw Gantt charts that illustrate the execution of these processes using FCFS and SJF - non preemptive.
  - What is average waiting time for both are scheduling algorithms in part (i)?
  - What is average turnaround time for both are scheduling algorithms in part (i)?
  - Which scheduling algorithm results in minimal average waiting time (over all process)?
- Represent waiting time and turnaround time for all processes in table.
- Explain classical problems of Synchronization in terms of Dining Philosopher problem.

**Section – II**

**Q.4 Attempt any three (Each carries 4 marks) 12**

- Explain the steps for page fault handling.
- Explain four essential conditions for the occurrence of deadlock.
- Explain swapping mechanism in paging.
- Write a note on DMA.

**Q.5 Attempt any two (Each carries 8 marks)**

- a) Explain deadlock prevention technique in detail.
- b) Let there be five processes (P1 to P5) and three resource types A, B and C. Resource type A has 10 instances. Resource type B has 5 instances. Resource type C has 7 instances. Suppose that at time,  $t_0$ , the following snapshot of the system has been taken:

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

- i) What is the content of need matrix?
- ii) Find the safe sequence. Is this system safe at time  $t_0$ ?
- iii) If process, P2 sends one additional request, can it be granted? Say P2 send the request of (1,0,2).
- c) Explain Paging in detail.

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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.

Marks: 14

14

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Set **P**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Base Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Answer any three questions. 12**

- Illustrate different Keys of DBMS.
- Compare Database management system over file storage system
- Classify different types of attributes.
- Construct the following SQL queries for *Bank Schema*
  - Find all customers of the bank who have an account but not a loan.
  - Find the names of all customers who live on the same street and in the same city as "Smith".

Bank Schema

branch ( <u>branch name</u> , branch city, assets) Customer ( <u>customer name</u> , customer street, customer city) Loan ( <u>loan number</u> , branch name, amount) Borrower ( <u>customer name</u> , <u>loan number</u> ) Account ( <u>account number</u> , branch name, balance) Depositor ( <u>customer name</u> , <u>account number</u> )
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**Q.3 Answer any two questions. 16**

- Find the highest normal form of a relation.
  - $R(A,B,C,D,E)$  with FD set  $\{A \rightarrow D, B \rightarrow A, BC \rightarrow D, AC \rightarrow BE\}$
  - $R(A,B,C,D,E)$  with FD set as  $\{BC \rightarrow D, AC \rightarrow BE, B \rightarrow E\}$
- Explain Various 'Joins' with example.
- Construct E-R Diagram for online movie ticket booking database.

**Section – II**

**Q.4 Answer any three questions. 12**

- Enlist different indexing technique with appropriate example.
- Explain Bitmap Indices with example.
- Draw and explain transaction state.
- Write various types of failures.

**Q.5 Answer any two questions. 16**

- What do you mean by concurrency control? Explain two-phase locking protocol.
- Explain deadlock detection and recovery from deadlock.
- Check whether the schedule is view serializable or not?  
 S: R2(B); R2(A); R1(A); R3(A); W1(B); W2(B); W3(B);

<b>Seat No.</b>	
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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.

Marks: 14

14

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Set 

Q
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Base Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Answer any three questions. 12**

- Illustrate different Keys of DBMS.
- Compare Database management system over file storage system
- Classify different types of attributes.
- Construct the following SQL queries for *Bank Schema*
  - Find all customers of the bank who have an account but not a loan.
  - Find the names of all customers who live on the same street and in the same city as "Smith".

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branch ( <u>branch name</u> , branch city, assets) Customer ( <u>customer name</u> , customer street, customer city) Loan ( <u>loan number</u> , branch name, amount) Borrower ( <u>customer name</u> , <u>loan number</u> ) Account ( <u>account number</u> , branch name, balance) Depositor ( <u>customer name</u> , <u>account number</u> )
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**Q.3 Answer any two questions. 16**

- Find the highest normal form of a relation.
  - $R(A,B,C,D,E)$  with FD set  $\{A \rightarrow D, B \rightarrow A, BC \rightarrow D, AC \rightarrow BE\}$
  - $R(A,B,C,D,E)$  with FD set as  $\{BC \rightarrow D, AC \rightarrow BE, B \rightarrow E\}$
- Explain Various 'Joins' with example.
- Construct E-R Diagram for online movie ticket booking database.

**Section – II**

**Q.4 Answer any three questions. 12**

- Enlist different indexing technique with appropriate example.
- Explain Bitmap Indices with example.
- Draw and explain transaction state.
- Write various types of failures.

**Q.5 Answer any two questions. 16**

- What do you mean by concurrency control? Explain two-phase locking protocol.
- Explain deadlock detection and recovery from deadlock.
- Check whether the schedule is view serializable or not?  
 S: R2(B); R2(A); R1(A); R3(A); W1(B); W2(B); W3(B);

Seat No.	
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Set 

R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Base Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Wrong statement about ORDER BY keyword is \_\_\_\_\_.
  - a) Used to sort the result-set in ascending or descending order
  - b) The ORDER BY keyword sorts the records in ascending order by default.
  - c) To sort the records in ascending order, use the ASC keyword.
  - d) To sort the records in descending order, use the DECENDING keyword.
- 2) Correct syntax query syntax to drop a column from a table is \_\_\_\_\_.
  - a) DELETE COLUMN *column\_name*;
  - b) DROP COLUMN *column\_name*;
  - c) ALTER TABLE *table\_\_name* DROP COLUMN *column\_name*;
  - d) None is correct
- 3) The primary indexes, secondary indexes and cluster indexes are all types of \_\_\_\_\_.
  - a) Ordered indexes
  - b) Unordered indexes
  - c) linear indexes
  - d) Relative search indexes
- 4) Which of the following is an operation of transactions?
  - a) Read
  - b) Write
  - c) Commit
  - d) All of the above
- 5) To include integrity constraint in an existing relation use \_\_\_\_\_.
  - a) Create table
  - b) Modify table
  - c) Alter table
  - d) Drop table
- 6) For each attribute of a relation, there is a set of permitted values, called the \_\_\_\_\_ of that attribute.
  - a) Domain
  - b) Relation
  - c) Set
  - d) Schema
- 7) Database \_\_\_\_\_ which is the logical design of the database, and the database \_\_\_\_\_ which is a snapshot of the data in the database at a given instant in time.
  - a) Instance, Schema
  - b) Relation, Schema
  - c) Relation, Domain
  - d) Schema, Instance

- 8) \_\_\_\_\_ expresses the number of entities to which another entity can be associated via a relationship set.
- a) Mapping Cardinality
  - b) Relational Cardinality
  - c) Participation Constraints
  - d) None of the mentioned
- 9) Identify the correct statement.
- a) Logical level Abstraction: hide details of data types.
  - b) Logical level Abstraction: describes how schema is stored in a data base.
  - c) Logical level Abstraction: describes how a record is stored.
  - d) Logical level Abstraction: describes accessibility of the database by an individual user
- 10) A relational database consists of a collection of \_\_\_\_\_.
- a) Tables
  - b) Fields
  - c) Records
  - d) Keys
- 11) In case of any failure, a log of each transaction can be recovered there from some \_\_\_\_\_ storage.
- a) Stable
  - b) Unstable
  - c) Recovery
  - d) System
- 12) In existing table, ALTER TABLE statement is used to \_\_\_\_\_.
- a) Add columns
  - b) Add constraints
  - c) Delete Columns
  - d) Delete constrains
  - e) All of the above
- 13) SQL Query to delete all rows in a table without deleting the table (structure, attributes, and indexes)
- a) DELETE FROM table\_name;
  - b) DELETE TABLE table\_name;
  - c) DROP TABLE table\_name;
  - d) NONE
- 14) Wrong statement about UPDATE keyword is \_\_\_\_\_.
- a) If WHERE clause is missing in statement the all records will be updated.
  - b) Only one record can be updated at a time using WHERE clause
  - c) Multiple records can be updated at a time using WHERE clause
  - d) None is wrong statement

Seat  
No.Set **R**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Base Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Answer any three questions.**

**12**

- Illustrate different Keys of DBMS.
- Compare Database management system over file storage system
- Classify different types of attributes.
- Construct the following SQL queries for *Bank* Schema
  - Find all customers of the bank who have an account but not a loan.
  - Find the names of all customers who live on the same street and in the same city as "Smith".

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**Q.3 Answer any two questions.**

**16**

- Find the highest normal form of a relation.
  - $R(A,B,C,D,E)$  with FD set  $\{A \rightarrow D, B \rightarrow A, BC \rightarrow D, AC \rightarrow BE\}$
  - $R(A,B,C,D,E)$  with FD set as  $\{BC \rightarrow D, AC \rightarrow BE, B \rightarrow E\}$
- Explain Various 'Joins' with example.
- Construct E-R Diagram for online movie ticket booking database.

**Section – II**

**Q.4 Answer any three questions.**

**12**

- Enlist different indexing technique with appropriate example.
- Explain Bitmap Indices with example.
- Draw and explain transaction state.
- Write various types of failures.

**Q.5 Answer any two questions.**

**16**

- What do you mean by concurrency control? Explain two-phase locking protocol.
- Explain deadlock detection and recovery from deadlock.
- Check whether the schedule is view serializable or not?  
 S: R2(B); R2(A); R1(A); R3(A); W1(B); W2(B); W3(B);

<b>Seat No.</b>	
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- 7) Correct syntax query syntax to drop a column from a table is \_\_\_\_\_.  
a) DELETE COLUMN *column\_name*;  
b) DROP COLUMN *column\_name*;  
c) ALTER TABLE *table\_name* DROP COLUMN *column\_name*;  
d) None is correct
- 8) The primary indexes, secondary indexes and cluster indexes are all types of \_\_\_\_\_.  
a) Ordered indexes  
b) Unordered indexes  
c) linear indexes  
d) Relative search indexes
- 9) Which of the following is an operation of transactions?  
a) Read  
b) Write  
c) Commit  
d) All of the above
- 10) To include integrity constraint in an existing relation use \_\_\_\_\_.  
a) Create table  
b) Modify table  
c) Alter table  
d) Drop table
- 11) For each attribute of a relation, there is a set of permitted values, called the \_\_\_\_\_ of that attribute.  
a) Domain  
b) Relation  
c) Set  
d) Schema
- 12) Database \_\_\_\_\_ which is the logical design of the database, and the database \_\_\_\_\_ which is a snapshot of the data in the database at a given instant in time.  
a) Instance, Schema  
b) Relation, Schema  
c) Relation, Domain  
d) Schema, Instance
- 13) \_\_\_\_\_ expresses the number of entities to which another entity can be associated via a relationship set.  
a) Mapping Cardinality  
b) Relational Cardinality  
c) Participation Constraints  
d) None of the mentioned
- 14) Identify the correct statement.  
a) Logical level Abstraction: hide details of data types.  
b) Logical level Abstraction: describes how schema is stored in a data base.  
c) Logical level Abstraction: describes how a record is stored.  
d) Logical level Abstraction: describes accessibility of the database by an individual user

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Set **S**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Base Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Answer any three questions. 12**

- Illustrate different Keys of DBMS.
- Compare Database management system over file storage system
- Classify different types of attributes.
- Construct the following SQL queries for *Bank Schema*
  - Find all customers of the bank who have an account but not a loan.
  - Find the names of all customers who live on the same street and in the same city as "Smith".

Bank Schema

branch (branch name, branch city, assets)  
 Customer (customer name, customer street, customer city)  
 Loan (loan number, branch name, amount)  
 Borrower (customer name, loan number)  
 Account (account number, branch name, balance)  
 Depositor (customer name, account number)

**Q.3 Answer any two questions. 16**

- Find the highest normal form of a relation.
  - $R(A,B,C,D,E)$  with FD set  $\{A \rightarrow D, B \rightarrow A, BC \rightarrow D, AC \rightarrow BE\}$
  - $R(A,B,C,D,E)$  with FD set as  $\{BC \rightarrow D, AC \rightarrow BE, B \rightarrow E\}$
- Explain Various 'Joins' with example.
- Construct E-R Diagram for online movie ticket booking database.

**Section – II**

**Q.4 Answer any three questions. 12**

- Enlist different indexing technique with appropriate example.
- Explain Bitmap Indices with example.
- Draw and explain transaction state.
- Write various types of failures.

**Q.5 Answer any two questions. 16**

- What do you mean by concurrency control? Explain two-phase locking protocol.
- Explain deadlock detection and recovery from deadlock.
- Check whether the schedule is view serializable or not?  
 $S: R_2(B); R_2(A); R_1(A); R_3(A); W_1(B); W_2(B); W_3(B);$





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Set 

P
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following case does not exist in complexity theory?
  - a) Best case
  - b) Worst case
  - c) Average case
  - d) Null case
- 2) If for an algorithm time complexity is given by  $O(1)$  then the complexity of it is \_\_\_\_\_.
  - a) constant
  - b) polynomial
  - c) exponential
  - d) none of the mentioned
- 3) What is the worst case complexity of binary search using recursion?
  - a)  $O(n \log n)$
  - b)  $O(\log n)$
  - c)  $O(n)$
  - d)  $O(n^2)$
- 4) Which of the following method is used for sorting in merge sort?
  - a) Merging
  - b) Partitioning
  - c) Selection
  - d) Exchanging
- 5) The result of the fractional knapsack is greater than or equal to 0/1 knapsack.
  - a) True
  - b) False
- 6) Which of the following statement about 0/1 knapsack and fractional knapsack problem is correct?
  - a) In 0/1 knapsack problem items are divisible and in fractional knapsack items are indivisible
  - b) Both are the same
  - c) 0/1 knapsack is solved using a greedy algorithm and fractional knapsack is solved using dynamic programming
  - d) In 0/1 knapsack problem items are indivisible and in fractional knapsack items are divisible
- 7) Dijkstra's Algorithm is used to solve \_\_\_\_\_ problems.
  - a) All pair shortest path
  - b) Single source shortest path
  - c) Network flow
  - d) Sorting

- 8) The correct matching for the following pairs is
- |                      |                        |
|----------------------|------------------------|
| A. Multistage graph  | 1. Greedy Method       |
| B. Kruskal Algorithm | 2. Dynamic Programming |
| C. Merge Sort        | 3. Backtracking        |
| D. Hamilton Cycle    | 4. Divide and Conquer  |
- a) A-3, B-2, C-4, D-1                      b) A-4, B-3, C-1, D-2  
c) A-2, B-1, C-4, D-3                      d) None
- 9) Floyd Warshall's Algorithm is used for solving \_\_\_\_\_.  
a) All pair shortest path problems  
b) Single Source shortest path problems  
c) Network flow problems  
d) Sorting problems
- 10) Which of the following problems is similar to that of a Hamiltonian path problem?  
a) knapsack problem                      b) closest pair problem  
c) travelling salesman problem        d) assignment problem
- 11) Backtracking algorithm is implemented by constructing a tree of choices called as?  
a) State-space tree                      b) State-chart tree  
c) Node tree                                d) Backtracking tree
- 12) Where is the n-queens problem implemented?  
a) Carom                                      b) Chess  
c) Ludo                                        d) Cards
- 13) \_\_\_\_\_ is the class of decision problems that can be solved by non-deterministic polynomial algorithms.  
a) NP    b) P  
c) Hard                                        d) Complete
- 14) Problems that can be solved in polynomial time are known as?  
a) intractable                                b) tractable  
c) decision                                    d) complete

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No.

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I****Q.2 Solve any three questions.****12**

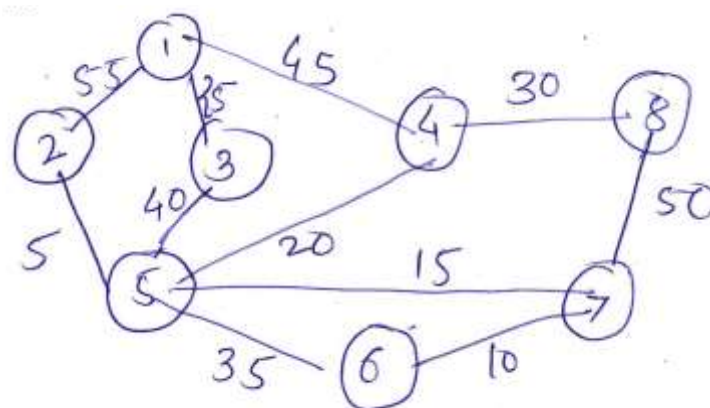
- Explain binary search and Write binary search algorithm
- Find time complexity using steps count method for following code.  
 Algorithm Add(a,b,c,m,n)  
 {  
   for i:=1 to m do  
     for j:=1 to n do  
       C[i,j]=a[i,j]+b[i,j]  
 }  
 }
- What are different specification of algorithm?
- Find an optimal solution to knapsack problem using greedy method.  
 M=60, n=5 (p<sub>1</sub>.....p<sub>5</sub>) = {15,25,40,20,36} and (w<sub>1</sub>.....w<sub>5</sub>) = {5,5,10,10,6}

**Q.3 Solve any one.****08**

- Write an algorithm based on divide and conquer methodology to sort algorithm using merge sort. And prove time complexity of Merge sort is  $O(n \log n)$ .

**OR**

- Explain optimal merge pattern in detail and find an optimal merge pattern for 8 files whose length (3,5,7,9,12,14,15,17). Calculate no of record move.

**Q.4 Find minimum weight /cost spanning tree using prim's algorithm & Kruskal algorithm.****08**

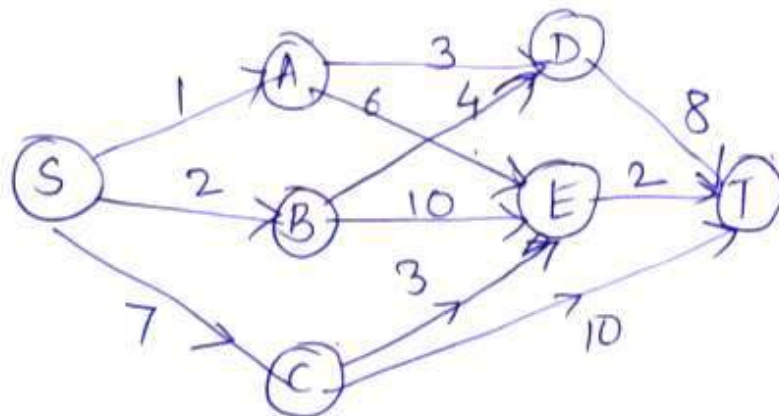
## Section – II

**Q.5 Solve any three questions.****12**

- Write a short note on flow shop scheduling.
- Design a three-stage system with device types D1, D2, D3. The cost are \$30, \$15, \$20 respectively. The cost of system is to be no more than \$105. The reliability of each device is 0.9, 0.8, 0.5 respectively.
- State and explain Graph coloring problem with example.
- Explain N queen problem. And explain N=4 Draw its portion of permutation tree.

**Q.6 Solve any one.****08**

- Find minimum cost path from s to t multistage graph using forward approach.

**OR**

- Write recursive algorithm for backtracking and explain it in detail.

**Q.7 Consider the following directed graph. Find optimal tour length of travelling sales person problem.****08**

$$\begin{bmatrix} 0 & 2 & 9 & 10 \\ 1 & 0 & 6 & 4 \\ 15 & 7 & 0 & 8 \\ 6 & 3 & 12 & 0 \end{bmatrix}$$

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The correct matching for the following pairs is
 

A. Multistage graph	1. Greedy Method
B. Kruskal Algorithm	2. Dynamic Programming
C. Merge Sort	3. Backtracking
D. Hamilton Cycle	4. Divide and Conquer

  - a) A-3, B-2, C-4, D-1
  - b) A-4, B-3, C-1, D-2
  - c) A-2, B-1, C-4, D-3
  - d) None
- 2) Floyd Warshall's Algorithm is used for solving \_\_\_\_\_.
  - a) All pair shortest path problems
  - b) Single Source shortest path problems
  - c) Network flow problems
  - d) Sorting problems
- 3) Which of the following problems is similar to that of a Hamiltonian path problem?
 

a) knapsack problem	b) closest pair problem
c) travelling salesman problem	d) assignment problem
- 4) Backtracking algorithm is implemented by constructing a tree of choices called as?
 

a) State-space tree	b) State-chart tree
c) Node tree	d) Backtracking tree
- 5) Where is the n-queens problem implemented?
 

a) Carom	b) Chess
c) Ludo	d) Cards
- 6) \_\_\_\_\_ is the class of decision problems that can be solved by non-deterministic polynomial algorithms.
 

a) NP	b) P
c) Hard	d) Complete
- 7) Problems that can be solved in polynomial time are known as?
 

a) intractable	b) tractable
c) decision	d) complete



Seat  
No.

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I****Q.2 Solve any three questions.****12**

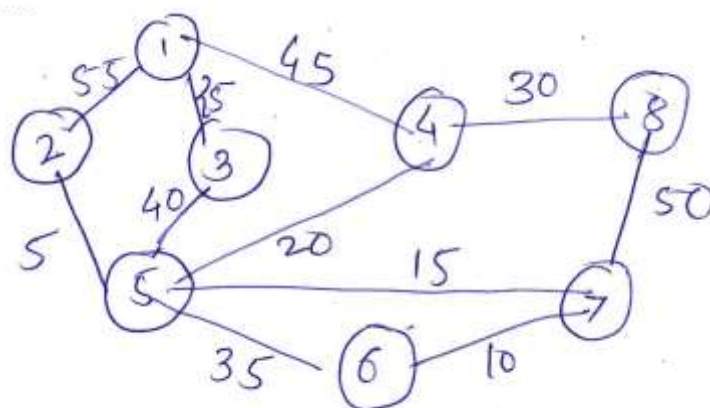
- Explain binary search and Write binary search algorithm
- Find time complexity using steps count method for following code.  
 Algorithm Add(a,b,c,m,n)  
 {  
   for i:=1 to m do  
     for j:=1 to n do  
       C[i,j]=a[i,j]+b[i,j]  
 }  
 }
- What are different specification of algorithm?
- Find an optimal solution to knapsack problem using greedy method.  
 M=60, n=5 (p1.....p5) = {15,25,40,20,36} and (w1.....w5) = {5,5,10,10,6}

**Q.3 Solve any one.****08**

- Write an algorithm based on divide and conquer methodology to sort algorithm using merge sort. And prove time complexity of Merge sort is  $O(n \log n)$ .

**OR**

- Explain optimal merge pattern in detail and find an optimal merge pattern for 8 files whose length (3,5,7,9,12,14,15,17). Calculate no of record move.

**Q.4 Find minimum weight /cost spanning tree using prim's algorithm & Kruskal algorithm.****08**

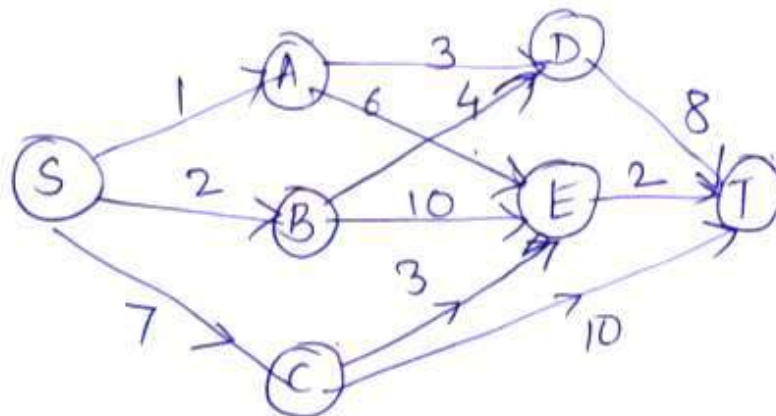
## Section – II

**Q.5 Solve any three questions.****12**

- Write a short note on flow shop scheduling.
- Design a three-stage system with device types D1, D2, D3. The cost are \$30, \$15, \$20 respectively. The cost of system is to be no more than \$105. The reliability of each device is 0.9, 0.8, 0.5 respectively.
- State and explain Graph coloring problem with example.
- Explain N queen problem. And explain N=4 Draw its portion of permutation tree.

**Q.6 Solve any one.****08**

- Find minimum cost path from s to t multistage graph using forward approach.

**OR**

- Write recursive algorithm for backtracking and explain it in detail.

**Q.7 Consider the following directed graph. Find optimal tour length of travelling sales person problem.****08**

$$\begin{bmatrix} 0 & 2 & 9 & 10 \\ 1 & 0 & 6 & 4 \\ 15 & 7 & 0 & 8 \\ 6 & 3 & 12 & 0 \end{bmatrix}$$



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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Backtracking algorithm is implemented by constructing a tree of choices called as?
 

a) State-space tree	b) State-chart tree
c) Node tree	d) Backtracking tree
- 2) Where is the n-queens problem implemented?
 

a) Carom	b) Chess
c) Ludo	d) Cards
- 3) \_\_\_\_\_ is the class of decision problems that can be solved by non-deterministic polynomial algorithms.
 

a) NP	b) P
c) Hard	d) Complete
- 4) Problems that can be solved in polynomial time are known as?
 

a) intractable	b) tractable
c) decision	d) complete
- 5) Which of the following case does not exist in complexity theory?
 

a) Best case	b) Worst case
c) Average case	d) Null case
- 6) If for an algorithm time complexity is given by  $O(1)$  then the complexity of it is \_\_\_\_\_.
 

a) constant	b) polynomial
c) exponential	d) none of the mentioned
- 7) What is the worst case complexity of binary search using recursion?
 

a) $O(n \log n)$	b) $O(\log n)$
c) $O(n)$	d) $O(n^2)$
- 8) Which of the following method is used for sorting in merge sort?
 

a) Merging	b) Partitioning
c) Selection	d) Exchanging
- 9) The result of the fractional knapsack is greater than or equal to 0/1 knapsack.
 

a) True	b) False
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- 10) Which of the following statement about 0/1 knapsack and fractional knapsack problem is correct?
- a) In 0/1 knapsack problem items are divisible and in fractional knapsack items are indivisible
  - b) Both are the same
  - c) 0/1 knapsack is solved using a greedy algorithm and fractional knapsack is solved using dynamic programming
  - d) In 0/1 knapsack problem items are indivisible and in fractional knapsack items are divisible
- 11) Dijkstra's Algorithm is used to solve \_\_\_\_\_ problems.
- a) All pair shortest path
  - b) Single source shortest path
  - c) Network flow
  - d) Sorting
- 12) The correct matching for the following pairs is
- |                      |                        |
|----------------------|------------------------|
| A. Multistage graph  | 1. Greedy Method       |
| B. Kruskal Algorithm | 2. Dynamic Programming |
| C. Merge Sort        | 3. Backtracking        |
| D. Hamilton Cycle    | 4. Divide and Conquer  |
- a) A-3, B-2, C-4, D-1
  - b) A-4, B-3, C-1, D-2
  - c) A-2, B-1, C-4, D-3
  - d) None
- 13) Floyd Warshall's Algorithm is used for solving \_\_\_\_\_.
- a) All pair shortest path problems
  - b) Single Source shortest path problems
  - c) Network flow problems
  - d) Sorting problems
- 14) Which of the following problems is similar to that of a Hamiltonian path problem?
- a) knapsack problem
  - b) closest pair problem
  - c) travelling salesman problem
  - d) assignment problem

Seat  
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any three questions.**

**12**

- Explain binary search and Write binary search algorithm
- Find time complexity using steps count method for following code.  
 Algorithm Add(a,b,c,m,n)  
 {  
   for i:=1 to m do  
     for j:=1 to n do  
       C[i,j]=a[i,j]+b[i,j]  
 }  
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- What are different specification of algorithm?
- Find an optimal solution to knapsack problem using greedy method.  
 M=60, n=5 (p<sub>1</sub>.....p<sub>5</sub>) = {15,25,40,20,36} and (w<sub>1</sub>.....w<sub>5</sub>) = {5,5,10,10,6}

**Q.3 Solve any one.**

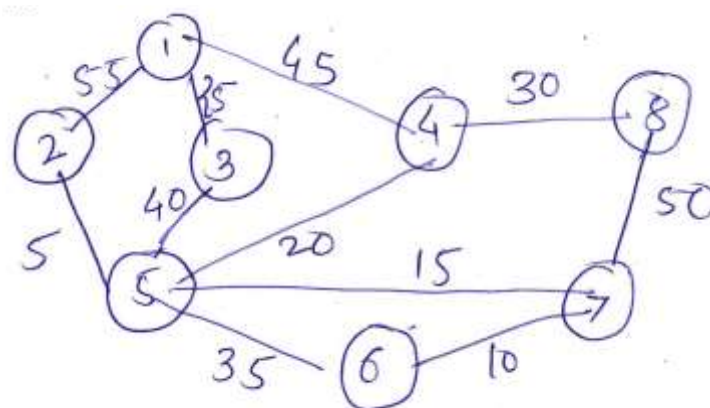
**08**

- Write an algorithm based on divide and conquer methodology to sort algorithm using merge sort. And prove time complexity of Merge sort is  $O(n \log n)$ .

**OR**

- Explain optimal merge pattern in detail and find an optimal merge pattern for 8 files whose length (3,5,7,9,12,14,15,17). Calculate no of record move.

**Q.4 Find minimum weight /cost spanning tree using prim's algorithm & Kruskal algorithm.**

**08**

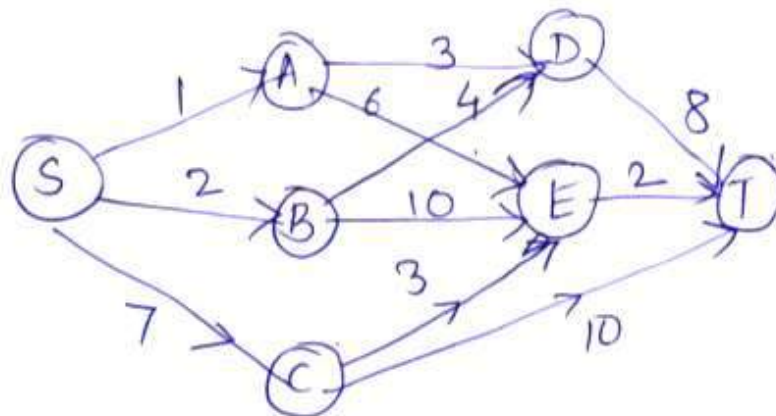
## Section – II

**Q.5 Solve any three questions.****12**

- Write a short note on flow shop scheduling.
- Design a three-stage system with device types D1, D2, D3. The cost are \$30, \$15, \$20 respectively. The cost of system is to be no more than \$105. The reliability of each device is 0.9, 0.8, 0.5 respectively.
- State and explain Graph coloring problem with example.
- Explain N queen problem. And explain N=4 Draw its portion of permutation tree.

**Q.6 Solve any one.****08**

- Find minimum cost path from s to t multistage graph using forward approach.

**OR**

- Write recursive algorithm for backtracking and explain it in detail.

**Q.7 Consider the following directed graph. Find optimal tour length of travelling sales person problem.****08**

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following statement about 0/1 knapsack and fractional knapsack problem is correct?
  - a) In 0/1 knapsack problem items are divisible and in fractional knapsack items are indivisible
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- 2) Dijkstra's Algorithm is used to solve \_\_\_\_\_ problems.
  - a) All pair shortest path
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  - c) Network flow
  - d) Sorting
- 3) The correct matching for the following pairs is
 

A. Multistage graph	1. Greedy Method
B. Kruskal Algorithm	2. Dynamic Programming
C. Merge Sort	3. Backtracking
D. Hamilton Cycle	4. Divide and Conquer

  - a) A-3, B-2, C-4, D-1
  - b) A-4, B-3, C-1, D-2
  - c) A-2, B-1, C-4, D-3
  - d) None
- 4) Floyd Warshall's Algorithm is used for solving \_\_\_\_\_.
  - a) All pair shortest path problems
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  - d) Sorting problems
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- 8) \_\_\_\_\_ is the class of decision problems that can be solved by non-deterministic polynomial algorithms.
- a) NP
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  - c) Hard
  - d) Complete
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  - c) decision
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- a)  $O(n \log n)$
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- 13) Which of the following method is used for sorting in merge sort?
- a) Merging
  - b) Partitioning
  - c) Selection
  - d) Exchanging
- 14) The result of the fractional knapsack is greater than or equal to 0/1 knapsack.
- a) True
  - b) False

Seat  
No.

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any three questions.**

**12**

- Explain binary search and Write binary search algorithm
- Find time complexity using steps count method for following code.  
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**Q.3 Solve any one.**

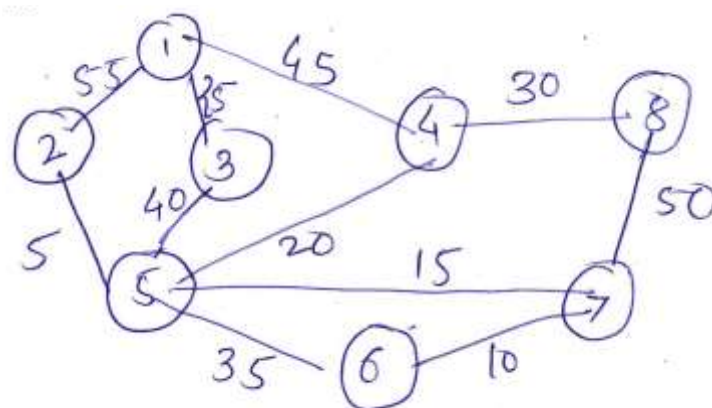
**08**

- Write an algorithm based on divide and conquer methodology to sort algorithm using merge sort. And prove time complexity of Merge sort is  $O(n \log n)$ .

**OR**

- Explain optimal merge pattern in detail and find an optimal merge pattern for 8 files whose length (3,5,7,9,12,14,15,17). Calculate no of record move.

**Q.4 Find minimum weight /cost spanning tree using prim's algorithm & Kruskal algorithm.**

**08**

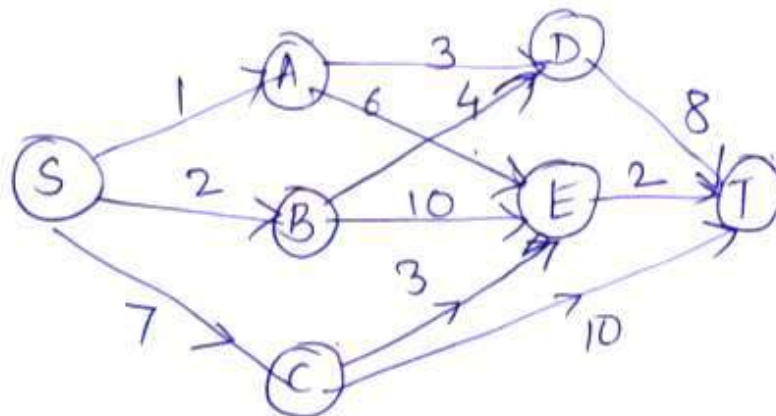
## Section – II

**Q.5 Solve any three questions.****12**

- Write a short note on flow shop scheduling.
- Design a three-stage system with device types D1, D2, D3. The cost are \$30, \$15, \$20 respectively. The cost of system is to be no more than \$105. The reliability of each device is 0.9, 0.8, 0.5 respectively.
- State and explain Graph coloring problem with example.
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- Find minimum cost path from s to t multistage graph using forward approach.

**OR**

- Write recursive algorithm for backtracking and explain it in detail.

**Q.7 Consider the following directed graph. Find optimal tour length of travelling sales person problem.****08**

$$\begin{bmatrix} 0 & 2 & 9 & 10 \\ 1 & 0 & 6 & 4 \\ 15 & 7 & 0 & 8 \\ 6 & 3 & 12 & 0 \end{bmatrix}$$



Seat No.	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Reinforcement learning is \_\_\_\_\_.  
 a) Unsupervised learning                      b) Supervised learning  
 c) Feedback based learning                      d) None of these
- 2) The multi-armed bandit problem is a generalized use case for \_\_\_\_\_.  
 a) Reinforcement learning                      b) Supervised learning  
 c) Unsupervised learning                      d) All of these
- 3) The key idea of using DP is the use of \_\_\_\_\_ to organize and structure the search for good policies.  
 a) Activation functions                      b) Value functions  
 c) Policy functions                      d) Discount factor
- 4) All the updates done in DP algorithms are called \_\_\_\_\_ because they are based on an expectation over all possible next states.  
 a) Predicted updates                      b) Sample updates  
 c) Expected updates                      d) Past updates
- 5) The process of making a new policy that improves on an original policy, by making it greedy with respect to the value function of the original policy, is called \_\_\_\_\_.  
 a) Policy prediction                      b) Policy process  
 c) Greedy Policy process                      d) Policy improvement
- 6) Any RL tasks composed of a set of states, actions and rewards that follows the \_\_\_\_\_ would be considered as MDP.  
 a) Markov property                      b) Backup policy  
 c) Bootstrap property                      d) Bellman equation
- 7) The use of a \_\_\_\_\_ to formalize the idea of a goal is one of the most distinctive features of reinforcement learning.  
 a) Policy                      b) Action  
 c) Reward signal                      d) State

- Page 2 of 12

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any THREE.** **12**
- What is reinforcement learning? Explain with diagram the steps in reinforcement learning.
  - What role do Exploration and Exploitation take w.r.t Reinforcement learning?
  - Explain the Multi armed bandit problem. List its applications.
  - What is the Markov property? Explain concept of MDP with its elements.
- Q.3 Attempt Any ONE.** **08**
- Explain policy and value function. Derive the bellman equation for value function and explain how it is used to find the optimal policy.
  - Explain the following Action-value methods along with their mathematical equations for computing action value in 10-armed bandit problem:
    - Sample-Averaging method
    - $\epsilon$ -greedy method
    - Incremental implementation method
- Q.4** Illustrate with diagram and equation the unified notation for episodic tasks and continuous task. **08**

**Section – II**

- Q.5 Attempt Any THREE.** **12**
- List the features of Temporal Difference Learning. Illustrate each of them.
  - Illustrate the working of SARSA (On-Policy TD control) method.
  - Explain the value iteration method in dynamic programming.
  - Differentiate between model based and model free learning
- Q.6 Attempt Any ONE.** **08**
- What is Samuel's Checkers Player? Explain its working in detail.
  - Write short notes:**
    - Dyna-Q
    - Monte Carlo method
- Q.7** What is Prioritized sweeping? Why it is needed? Explain it in detail. **08**

<b>Seat No.</b>	
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Seat No.	
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Set	Q
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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**Section – I**

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  - What is the Markov property? Explain concept of MDP with its elements.
- Q.3 Attempt Any ONE.** **08**
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  - Explain the following Action-value methods along with their mathematical equations for computing action value in 10-armed bandit problem:
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- Q.4** Illustrate with diagram and equation the unified notation for episodic tasks and continuous task. **08**

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- List the features of Temporal Difference Learning. Illustrate each of them.
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    - Dyna-Q
    - Monte Carlo method
- Q.7** What is Prioritized sweeping? Why it is needed? Explain it in detail. **08**

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ includes all the processes such as planning, acting, model-learning, and direct RL which occurs continually.
  - a) MDP
  - b) Dyna-Q
  - c) Q-learning
  - d) Monte Carlo
- 2) The motivation behind Dyna-Q+ is to give a \_\_\_\_\_ for actions that have not been tried for a long time, since there is a greater chance that the dynamics for that actions might have changed.
  - a) Bonus reward
  - b) Discounted reward
  - c) Punishment
  - d) None of these
- 3) TD learning is combines ideas from \_\_\_\_\_.
  - a) Monte Carlo and dynamic programming
  - b) Greedy method and Monte Carlo
  - c) Dynamic programming and Greedy method
  - d) None of these
- 4) In the given equation,  $\text{total\_reward} = R_1 + \gamma R_2 + \gamma^2 R_2 + \gamma^3 R_3 + \dots$ ,  $\gamma$  is called as \_\_\_\_\_.
  - a) Discount rate
  - b) Punishment value
  - c) Reward
  - d) State value
- 5) Reinforcement learning is \_\_\_\_\_.
  - a) Unsupervised learning
  - b) Supervised learning
  - c) Feedback based learning
  - d) None of these
- 6) The multi-armed bandit problem is a generalized use case for \_\_\_\_\_.
  - a) Reinforcement learning
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  - c) Unsupervised learning
  - d) All of these
- 7) The key idea of using DP is the use of \_\_\_\_\_ to organize and structure the search for good policies.
  - a) Activation functions
  - b) Value functions
  - c) Policy functions
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- 8) All the updates done in DP algorithms are called \_\_\_\_\_ because they are based on an expectation over all possible next states.
- a) Predicted updates
  - b) Sample updates
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- 9) The process of making a new policy that improves on an original policy, by making it greedy with respect to the value function of the original policy, is called \_\_\_\_\_.
- a) Policy prediction
  - b) Policy process
  - c) Greedy Policy process
  - d) Policy improvement
- 10) Any RL tasks composed of a set of states, actions and rewards that follows the \_\_\_\_\_ would be considered as MDP.
- a) Markov property
  - b) Backup policy
  - c) Bootstrap property
  - d) Bellman equation
- 11) The use of a \_\_\_\_\_ to formalize the idea of a goal is one of the most distinctive features of reinforcement learning.
- a) Policy
  - b) Action
  - c) Reward signal
  - d) State
- 12) In many cases the agent-environment interaction does not break naturally into identifiable episodes, but goes on continually without limit. We call these as \_\_\_\_\_.
- a) Episodic task
  - b) Continuous task
  - c) Both a) and b)
  - d) None of these
- 13) Methods for solving reinforcement learning problems that use models and planning are called \_\_\_\_\_.
- a) Model-free method
  - b) Model-based method
  - c) Both a) and b)
  - d) None of these
- 14) A \_\_\_\_\_ would produce all possible sums and their probabilities of occurring, whereas a \_\_\_\_\_ would produce an individual sum drawn according to this probability distribution.
- a) Distribution model, Sample model
  - b) Sample model, Distribution model
  - c) Sample model, Stochastic model
  - d) None of these



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

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**Section – II**

- Q.5 Attempt Any THREE.** **12**
- List the features of Temporal Difference Learning. Illustrate each of them.
  - Illustrate the working of SARSA (On-Policy TD control) method.
  - Explain the value iteration method in dynamic programming.
  - Differentiate between model based and model free learning
- Q.6 Attempt Any ONE.** **08**
- What is Samuel's Checkers Player? Explain its working in detail.
  - Write short notes:**
    - Dyna-Q
    - Monte Carlo method
- Q.7** What is Prioritized sweeping? Why it is needed? Explain it in detail. **08**

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Any RL tasks composed of a set of states, actions and rewards that follows the \_\_\_\_\_ would be considered as MDP.
  - a) Markov property
  - b) Backup policy
  - c) Bootstrap property
  - d) Bellman equation
- 2) The use of a \_\_\_\_\_ to formalize the idea of a goal is one of the most distinctive features of reinforcement learning.
  - a) Policy
  - b) Action
  - c) Reward signal
  - d) State
- 3) In many cases the agent-environment interaction does not break naturally into identifiable episodes, but goes on continually without limit. We call these as \_\_\_\_\_.
  - a) Episodic task
  - b) Continuous task
  - c) Both a) and b)
  - d) None of these
- 4) Methods for solving reinforcement learning problems that use models and planning are called \_\_\_\_\_.
  - a) Model-free method
  - b) Model-based method
  - c) Both a) and b)
  - d) None of these
- 5) A \_\_\_\_\_ would produce all possible sums and their probabilities of occurring, whereas a \_\_\_\_\_ would produce an individual sum drawn according to this probability distribution.
  - a) Distribution model, Sample model
  - b) Sample model, Distribution model
  - c) Sample model, Stochastic model
  - d) None of these
- 6) \_\_\_\_\_ includes all the processes such as planning, acting, model-learning, and direct RL which occurs continually.
  - a) MDP
  - b) Dyna-Q
  - c) Q-learning
  - d) Monte Carlo

- 7) The motivation behind Dyna-Q+ is to give a \_\_\_\_\_ for actions that have not been tried for a long time, since there is a greater chance that the dynamics for that actions might have changed.
- a) Bonus reward
  - b) Discounted reward
  - c) Punishment
  - d) None of these
- 8) TD learning is combines ideas from \_\_\_\_\_.
- a) Monte Carlo and dynamic programming
  - b) Greedy method and Monte Carlo
  - c) Dynamic programming and Greedy method
  - d) None of these
- 9) In the given equation,  $\text{total\_reward} = R_1 + \gamma R_2 + \gamma^2 R_2 + \gamma^3 R_3 + \dots$ ,  $\gamma$  is called as \_\_\_\_\_.
- a) Discount rate
  - b) Punishment value
  - c) Reward
  - d) State value
- 10) Reinforcement learning is \_\_\_\_\_.
- a) Unsupervised learning
  - b) Supervised learning
  - c) Feedback based learning
  - d) None of these
- 11) The multi-armed bandit problem is a generalized use case for \_\_\_\_\_.
- a) Reinforcement learning
  - b) Supervised learning
  - c) Unsupervised learning
  - d) All of these
- 12) The key idea of using DP is the use of \_\_\_\_\_ to organize and structure the search for good policies.
- a) Activation functions
  - b) Value functions
  - c) Policy functions
  - d) Discount factor
- 13) All the updates done in DP algorithms are called \_\_\_\_\_ because they are based on an expectation over all possible next states.
- a) Predicted updates
  - b) Sample updates
  - c) Expected updates
  - d) Past updates
- 14) The process of making a new policy that improves on an original policy, by making it greedy with respect to the value function of the original policy, is called \_\_\_\_\_.
- a) Policy prediction
  - b) Policy process
  - c) Greedy Policy process
  - d) Policy improvement

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any THREE. 12**
- What is reinforcement learning? Explain with diagram the steps in reinforcement learning.
  - What role do Exploration and Exploitation take w.r.t Reinforcement learning?
  - Explain the Multi armed bandit problem. List its applications.
  - What is the Markov property? Explain concept of MDP with its elements.
- Q.3 Attempt Any ONE. 08**
- Explain policy and value function. Derive the bellman equation for value function and explain how it is used to find the optimal policy.
  - Explain the following Action-value methods along with their mathematical equations for computing action value in 10-armed bandit problem:
    - Sample-Averaging method
    - $\epsilon$ -greedy method
    - Incremental implementation method
- Q.4 Illustrate with diagram and equation the unified notation for episodic tasks and continuous task. 08**

**Section – II**

- Q.5 Attempt Any THREE. 12**
- List the features of Temporal Difference Learning. Illustrate each of them.
  - Illustrate the working of SARSA (On-Policy TD control) method.
  - Explain the value iteration method in dynamic programming.
  - Differentiate between model based and model free learning
- Q.6 Attempt Any ONE. 08**
- What is Samuel's Checkers Player? Explain its working in detail.
  - Write short notes:**
    - Dyna-Q
    - Monte Carlo method
- Q.7 What is Prioritized sweeping? Why it is needed? Explain it in detail. 08**

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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

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3) Figures to the right indicates full marks.

Marks: 14

## 14

- 1) Which of the measures given here are based on every item of the series (uses all Observations)?
  - a) Range
  - b) Standard Deviation
  - c) Quartile Deviation
  - d) All of the above
- 2) Find the median of the following data:  
160, 180, 200, 280, 300, 320, 400
  - a) 140
  - b) 300
  - c) 180
  - d) 280
- 3) A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Which of the following statement is true in following case?
  - a) Feature F1 is an example of nominal variable.
  - b) Feature F1 is an example of ordinal variable.
  - c) It doesn't belong to any of the above category
  - d) Both of these
- 4) What are the benefits of Data Visualizations?
  - a) Better Analysis
  - b) Identifying patterns
  - c) Exploring Business Insights
  - d) All of the above
- 5) "The sum of squares of deviations of the values is least" when deviations are taken from \_\_\_\_\_.
  - a) Median
  - b) Mode
  - c) Arithmetic Mean
  - d) Geometric Mean
- 6) In a week the prices of a bag of rice were 350, 280, 340, 290, 320, 310, 300. The range is \_\_\_\_\_.
  - a) 60
  - b) 90
  - c) 70
  - d) 100

- 7) Taking mean centring for a given variable is achieved by:
- Taking the mean of all scores (ignoring from which variable they come) and subtracting each score from it.
  - Taking each score and subtracting from it the mean of all scores (for that variable).
  - Taking each score and dividing it by the mean of all scores (for that variable).
  - Taking each score, subtracting the mean and then dividing by the standard deviation.
- 8) The combined effect of two variables on another is known conceptually as \_\_\_\_\_, and in statistical terms as \_\_\_\_\_.
- Mediation, an interaction effect
  - Moderation, a direct effect
  - Moderation, an interaction effect
  - Mediation, a direct effect
- 9) Which of the following quantities does not affect the width of the confidence interval for a population proportion?
- Sample Proportion
  - Population Size
  - Sample size
  - Confidence level
- 10) Which of the following is true about hypothesis testing?
- Hypothesis are statements about the population(s)
  - Results are said to be statistically significant when the p-value is greater than the alpha level.
  - The test statistic is a population parameter
  - None of the above
- 11) What will be printed?
- ```
import numpy as np
a = np.array([1,2,3,5,8])
b = np.array([0,3,4,2,1])
c = a + b
c = c*a
print (c[2])
```
- 7
  - 12
  - 10
  - 21
- 12) A Tabular arrangement for classifying data into different groups is called \_\_\_\_.
- Standard deviation
  - frequency distribution
  - Secondary data
  - Arithmetic Mean
- 13) Which of the following ways to create a MultiIndex (multi-level index)?
- From a list of arrays using MultiIndex.from\_arrays()
  - From an array of tuples using MultiIndex.from\_tuples()
  - rom a crossed set of iterables using MultiIndex.from\_product()
  - All of the above
- 14) Amongst which of the following is a correct syntax for panda's dataframe?
- Pandas.DataFrame(data, index, dtype, copy)
  - pandas.DataFrame( data, index, columns, dtype, copy)
  - pandas.DataFrame(data, index, dtype, copy)
  - pandas.DataFrame( data, index, rows, dtype, copy)

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- a) Write a program to create an empty array of 3X4 and full array of 3X3 of INTEGER type?
  - b) What type of plot would you use if you need to demonstrate “relationship” between variables/parameters?
  - c) What is nominal variable and ordinal variable? Explain with examples.
  - d) What are ways of creating 1D, 2D and 3D arrays in NumPy?
  - e) How do you convert Pandas DataFrame to a NumPy array?
- Q.3 a) Define a Range? What are the Applications of Range? Explain the method of How to Find Range with example?** **06**
- b) Find the standard deviation of the average temperatures recorded over a five-day period last winter:** **06**
- 18,22,19,25,12

**Section – II**

- Q.4 Attempt Any FOUR:** **16**
- a) What is Data visualization? What are the advantages of Data Visualization?
  - b) Draw a diagram of Box plot representing multi-variate categorical variables.
  - c) Define a scatter plot? Write syntax of scatter plot and explain its parameter in the syntax.
  - d) Name any 4 libraries in Python used for Data Analysis and Scientific computations?
  - e) How can we visualize more than three dimensions of data in a single chart?
- Q.5 Attempt Any ONE:** **12**
- a) Describe in detail Three-Dimensional Plotting in Matplotlib.
  - b) What is a dynamic technique in data visualization? explain with Example.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The combined effect of two variables on another is known conceptually as \_\_\_\_\_, and in statistical terms as \_\_\_\_\_.  
 a) Mediation, an interaction effect  
 b) Moderation, a direct effect  
 c) Moderation, an interaction effect  
 d) Mediation, a direct effect
- 2) Which of the following quantities does not affect the width of the confidence interval for a population proportion?  
 a) Sample Proportion                      b) Population Size  
 c) Sample size                                d) Confidence level
- 3) Which of the following is true about hypothesis testing?  
 a) Hypothesis are statements about the population(s)  
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 c) The test statistic is a population parameter  
 d) None of the above
- 4) What will be printed?  
 import numpy as np  
 a = np.array([1,2,3,5,8])  
 b = np.array([0,3,4,2,1])  
 c = a + b  
 c = c\*a  
 print (c[2])  
 a) 7                                              b) 12  
 c) 10                                            d) 21
- 5) A Tabular arrangement for classifying data into different groups is called \_\_\_\_.  
 a) Standard deviation                      b) frequency distribution  
 c) Secondary data                            d) Arithmetic Mean



- 6) Which of the following ways to create a MultiIndex (multi-level index)?
- a) From a list of arrays using MultiIndex.from\_arrays()
  - b) From an array of tuples using MultiIndex.from\_tuples()
  - c) From a crossed set of iterables using MultiIndex.from\_product()
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- 7) Amongst which of the following is a correct syntax for panda's dataframe?
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- 8) Which of the measures given here are based on every item of the series (uses all Observations)?
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- 9) Find the median of the following data:  
160, 180, 200, 280, 300, 320, 400
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
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**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- Write a program to create an empty array of 3X4 and full array of 3X3 of INTEGER type?
  - What type of plot would you use if you need to demonstrate “relationship” between variables/parameters?
  - What is nominal variable and ordinal variable? Explain with examples.
  - What are ways of creating 1D, 2D and 3D arrays in NumPy?
  - How do you convert Pandas DataFrame to a NumPy array?
- Q.3 a)** Define a Range? What are the Applications of Range? Explain the method of How to Find Range with example? **06**
- b)** Find the standard deviation of the average temperatures recorded over a five-day period last winter: **06**  
 18,22,19,25,12

**Section – II**

- Q.4 Attempt Any FOUR:** **16**
- What is Data visualization? What are the advantages of Data Visualization?
  - Draw a diagram of Box plot representing multi-variate categorical variables.
  - Define a scatter plot? Write syntax of scatter plot and explain its parameter in the syntax.
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What will be printed?  

```
import numpy as np

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c = c*a
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```

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  - b) 12
  - c) 10
  - d) 21
- 2) A Tabular arrangement for classifying data into different groups is called \_\_\_\_\_.
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- 6) Find the median of the following data:  
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  - c) 180
  - d) 280

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- Write a program to create an empty array of 3X4 and full array of 3X3 of INTEGER type?
  - What type of plot would you use if you need to demonstrate “relationship” between variables/parameters?
  - What is nominal variable and ordinal variable? Explain with examples.
  - What are ways of creating 1D, 2D and 3D arrays in NumPy?
  - How do you convert Pandas DataFrame to a NumPy array?
- Q.3 a)** Define a Range? What are the Applications of Range? Explain the method of How to Find Range with example? **06**
- b)** Find the standard deviation of the average temperatures recorded over a five-day period last winter: **06**  
 18,22,19,25,12

**Section – II**

- Q.4 Attempt Any FOUR:** **16**
- What is Data visualization? What are the advantages of Data Visualization?
  - Draw a diagram of Box plot representing multi-variate categorical variables.
  - Define a scatter plot? Write syntax of scatter plot and explain its parameter in the syntax.
  - Name any 4 libraries in Python used for Data Analysis and Scientific computations?
  - How can we visualize more than three dimensions of data in a single chart?
- Q.5 Attempt Any ONE:** **12**
- Describe in detail Three-Dimensional Plotting in Matplotlib.
  - What is a dynamic technique in data visualization? explain with Example.

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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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Marks: 14

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- Page 11 of 12

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- Write a program to create an empty array of 3X4 and full array of 3X3 of INTEGER type?
  - What type of plot would you use if you need to demonstrate “relationship” between variables/parameters?
  - What is nominal variable and ordinal variable? Explain with examples.
  - What are ways of creating 1D, 2D and 3D arrays in NumPy?
  - How do you convert Pandas DataFrame to a NumPy array?
- Q.3 a)** Define a Range? What are the Applications of Range? Explain the method of How to Find Range with example? **06**
- b)** Find the standard deviation of the average temperatures recorded over a five-day period last winter: **06**  
 18,22,19,25,12

**Section – II**

- Q.4 Attempt Any FOUR:** **16**
- What is Data visualization? What are the advantages of Data Visualization?
  - Draw a diagram of Box plot representing multi-variate categorical variables.
  - Define a scatter plot? Write syntax of scatter plot and explain its parameter in the syntax.
  - Name any 4 libraries in Python used for Data Analysis and Scientific computations?
  - How can we visualize more than three dimensions of data in a single chart?
- Q.5 Attempt Any ONE:** **12**
- Describe in detail Three-Dimensional Plotting in Matplotlib.
  - What is a dynamic technique in data visualization? explain with Example.



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Network Security and Secure Coding**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly .

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is Cyber Security?
  - a) Cyber Security provides security against malware
  - b) Cyber Security provides security against cyber-terrorists
  - c) Cyber Security protects a system from cyber attacks
  - d) All of the mentioned
- 2) Which of the following is an objective of network security?
  - a) Confidentiality
  - b) Integrity
  - c) Availability
  - d) All of the above
- 3) Which of the following is a type of cyber attack?
  - a) Phishing
  - b) SQL Injections
  - c) Password Attack
  - d) All of the above
- 4) Which of the following act violates cyber security?
  - a) Exploit
  - b) Attack
  - c) Threat
  - d) Vulnerability
- 5) Which of the following do Cyber attackers commonly target for fetching IP address of a target or victim user?
  - a) ip tracker
  - b) emails
  - c) websites
  - d) web pages
- 6) Which of the following is an internet scam done by cyber-criminals where the user is convinced digitally to provide confidential information?
  - a) MiTM attack
  - b) Phishing attack
  - c) Website attack
  - d) DoS attack
- 7) \_\_\_\_\_ is the cyclic practice for identifying & classifying and then solving the vulnerabilities in a system.
  - a) Bug protection
  - b) Bug bounty
  - c) Vulnerability measurement
  - d) Vulnerability management

- 8) A \_\_\_\_\_ is a trusted third party that assigns a symmetric key to two parties.
- a) KDC
  - b) CA
  - c) KDD
  - d) None of above
- 9) In the \_\_\_\_\_ mode, IPSec protects the whole IP packet, including the original IP header.
- a) Transport
  - b) Tunnel
  - c) AH
  - d) ESP
- 10) In \_\_\_\_\_ the cryptographic algorithms and secrets are sent with the message.
- a) IPSec
  - b) SSL
  - c) TLS
  - d) PGP
- 11) \_\_\_\_\_ is a computer on a network which act as an intermediary for connections with other computers on the network.
- a) Proxy Server
  - b) Anonymizer
  - c) Both a & b
  - d) Neither a nor b
- 12) Phishing execute following sequential steps
- a) Planning, Collection, Setup, Attack
  - b) Planning, Setup, Collection, Attack
  - c) Planning, Setup, Attack, Collection
  - d) Collection, Planning, Setup, Attack
- 13) Following is the event dependent program executed only when certain event occur \_\_\_\_\_.
- a) Logic Bomb
  - b) Salami
  - c) Email Bombing
  - d) Trojan Horse
- 14) Financial motivation hacking coming under type of \_\_\_\_\_.
- a) Hungry for Recognition
  - b) Not interested in Recognition
  - c) The insider
  - d) The Outsider

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Network Security and Secure Coding**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- a) Explain Security Service.
  - b) Write a note on secure hash function.
  - c) Write a note on key management Kerberos.
  - d) Write a note on ARP attack.
  - e) Explain model of internetwork security.
- Q.3 Attempt any Two:** **12**
- a) Explain block cipher modes of operation with suitable diagram.
  - b) Explain approaches of message authentication.
  - c) Describe digital signature standard.

**Section – II**

- Q.4 Attempt Any Four:** **16**
- a) Explain viruses with their structure, type and nature in detail.
  - b) Write note of fuzzing.
  - c) Write a note on PGP.
  - d) Define the term:
    - i) E-mail bombing
    - ii) Salami attack
    - iii) Logic bomb
    - iv) Data diddling
  - e) Explain intrusion detection system.
- Q.5 Attempt Any Two:** **12**
- a) Write a note S/MIME.
  - b) Explain Encapsulating security payload.
  - c) Write a note on Firewall Design principal.

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above



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**Set Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |                                                                                          |               |
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| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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Set **R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.  
a) which can be only changed in the long run  
b) which can be changed in the short run  
c) which can be never be changed  
d) All of the above
- 10) Which one of the following is not the function of money?  
a) Medium of exchange  
b) Measure of Happiness  
c) Standard of deferred payment  
d) Store of value

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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |                                                                                          |               |
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| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-206**

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**Set S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850



- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- |              |               |
|--------------|---------------|
| a) Copyright | b) Patents    |
| c) Contracts | d) Trademarks |

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| <b>Set</b> | <b>P</b> |
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

|          |              |
|----------|--------------|
| a) Art   | b) Invention |
| c) Goods | d) Ideas     |
- 2) What is copyright meant for?
 

|              |                 |
|--------------|-----------------|
| a) Film work | b) Books        |
| c) Essay     | d) All of these |
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

|                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

|         |         |
|---------|---------|
| a) 1856 | b) 1880 |
| c) 1905 | d) 1850 |
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

|              |               |
|--------------|---------------|
| a) Copyright | b) Patents    |
| c) Contracts | d) Trademarks |
- 6) Which is not a type of intellectual property?
 

|                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 7) In which article is intellectual property rights outlined?
 

|               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |
- 8) How long does intellectual property last? (after the death of the author)
 

|           |           |
|-----------|-----------|
| a) 10 yrs | b) 30 yrs |
| c) 60 yrs | d) 70 yrs |
- 9) Which of the following can you copyright?
 

|                       |            |
|-----------------------|------------|
| a) Literary work      | b) Ideas   |
| c) Choreographic work | d) Fashion |

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

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**Set Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks:10

10

- Page 7 of 12

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works



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Set **S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

|                 |              |
|-----------------|--------------|
| a) August Comte | b) Srinivas  |
| c) Ghurye       | d) Aristotle |
- 2) What is culture?
 

|                 |                |
|-----------------|----------------|
| a) literature   | b) way of life |
| c) food rituals | d) fashions    |
- 3) What is social norm?
 

|                       |                |
|-----------------------|----------------|
| a) social conventions | b) social laws |
| c) dos and don'ts     | d) governance  |
- 4) What is demography?
 

|                          |                       |
|--------------------------|-----------------------|
| a) science of society    | b) study of migration |
| c) science of population | d) study of races     |
- 5) Which of the following is applicable to tribal community?
 

|             |                |
|-------------|----------------|
| a) Religion | b) Culture     |
| c) Songs    | d) Homogeneity |
- 6) Who was the leader of the Narmada bachao movement?
 

|                  |                 |
|------------------|-----------------|
| a) Anna Hajare   | b) Medha Patkar |
| c) H.N. Bahuguna | d) Kejriwal     |
- 7) Who is the founder of Satyashodhak samaj?
 

|                 |                     |
|-----------------|---------------------|
| a) Vinoba Bhave | b) Mahatma Phule    |
| c) M. Gandhi    | d) Rajaram Mohanroy |
- 8) Which is distinctive nature of family?
 

|                   |                    |
|-------------------|--------------------|
| a) Small family   | b) Large family    |
| c) Bilateral unit | d) Unilateral unit |
- 9) What is the percentage of potable water on the earth?
 

|       |       |
|-------|-------|
| a) 2% | b) 3% |
| c) 5% | d) 7% |
- 10) Which of the following is the reformist movement?
 

|                       |                             |
|-----------------------|-----------------------------|
| a) Chipko movement    | b) Non-cooperation movement |
| c) Anti-Sati movement | d) Freedom movement         |

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022

**COMPUTER SCIENCE & ENGINEERING****Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 2) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 3) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 4) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 5) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 6) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 7) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit



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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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Set **S**

T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022

**COMPUTER SCIENCE & ENGINEERING****Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 2) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 3) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 5) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 6) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 8) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 9) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 10) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

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**Set****P****T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022****COMPUTER SCIENCE & ENGINEERING****Stress and Coping**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |                                                                  |           |
|------------|------------------------------------------------------------------|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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## Max. Marks: 50

Marks: 10

## 10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above



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| <b>Set</b> | <b>Q</b> |
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**COMPUTER SCIENCE & ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |                                                                  |           |
|------------|------------------------------------------------------------------|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_.
- a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**COMPUTER SCIENCE & ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |                                                                  |           |
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| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

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|------------|------------------------------------------------------------------|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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## Max. Marks: 50

Marks:10

## 10

- Page 1 of 12



- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

- Page 5 of 12

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4 Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics



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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks:10

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- Page 10 of 12

- 9) Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture  
b) Value  
c) Society  
d) Moral
- 10) Virtues are \_\_\_\_\_.  
a) Moral  
b) Ethics  
c) Values  
d) Positive and preferred values

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**System Programming**

Day & Date: Saturday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The designer expresses the ideas in terms related to the \_\_\_\_\_.  
 a) application domain                      b) execution domain  
 c) all of the above                          d) none of the above
- 2) The semantic gap has many consequences like \_\_\_\_\_.  
 a) large development time                  b) large development efforts  
 c) poor quality of software                  d) all of the above
- 3) Program generation activities and program execution activities are the processing activities that come under \_\_\_\_\_.  
 a) Processing activities  
 b) Language processing activities  
 c) All of the above  
 d) None of the above
- 4) Which of the following might be used to convert high-level language instructions into machine language?  
 a) System software                          b) Applications software  
 c) An operating environment              d) An interpreter
- 5) Indicate which of the following is not true about an interpreter?  
 a) Interpreter generates an object program from the source program  
 b) Interpreter is a kind of translator  
 c) Interpreter analyses each source statement every time it is to be executed  
 d) All of the above
- 6) Which of the following program converts assembly language program to object programs?  
 a) Assembler                                  b) Compiler  
 c) Macro processor                          d) Linker
- 7) \_\_\_\_\_ converts the programs written in assembly language into machine instructions.  
 a) Machine compiler                          b) Interpreter  
 c) Assembler                                  d) Converter

- 8) A system program that sets up an executable program in main memory ready for execution
- a) Assembler
  - b) Linker
  - c) Loader
  - d) Load and go
- 9) During macro expansion each statement is replaced by \_\_\_\_\_.  
a) The original program  
b) The sequence of assembly statement  
c) By specific symbols  
d) None of the above
- 10) A macro can be defined at \_\_\_\_\_.  
a) Beginning of a program      b) End of a program  
c) After initialization of program      d) Anywhere in a program
- 11) Macro processor is an inbuilt function of -  
a) Assembler      b) Loader  
c) Linker      d) Editor
- 12) To overcome the problems of the assembler in dealing with branching code we use \_\_\_\_\_.  
a) Interpreter      b) Debugger  
c) Op-Assembler      d) Two-pass assemble
- 13) Compiler can check \_\_\_\_\_.  
a) Syntax Error      b) Logical Error  
c) Both Logical and Syntax Error      d) None of the above
- 14) Translator for low level programming language were termed as \_\_\_\_\_.  
a) Assembler      b) Compiler  
c) Linker      d) Loader

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**System Programming**

Day & Date: Saturday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Describe front end & back end of toy compiler with the help of examples.
- b) What is IR? Prepare an IR by making front end analysis of following program  
P : integer;  
Q, R: real;  
Q: = R + P;
- c) List and explain types of elements of assembly language programming.
- d) Classify the fundamental language processing activities.
- e) Define and Describe Nested macro call.
- f) Define macro definition, call and expansion in detail with the help of examples.

**Q.3 Attempt any One.** **06**

- a) Define Language processor? List and explain different types of language processor with example.
- b) Write down the tasks performed in the analysis phase and synthesis phase of Assembler.

**Q.4 Attempt the following.** **06**

- a) List major issues in code generation for expression. Explain operand & register Descriptor with example.

**Section – II**

**Q.5 Attempt any Four** **16**

- a) Explain aspects of compilation.
- b) What are triples, quadruples and indirect triples? Explain.
- c) Define linker? And what are binary programs & object modules used in linker?
- d) What is absolute loader? How it differs from relocating loader.
- e) What is Loader? Explain the four basic functions of any loader.
- f) Compare linking address & loading address.

**Q.6 Attempt any one.**

- a)** Compare the direct linking and self relocating loader.
- b)** List & explain the PL features used in implementation of aspects of compilation.

**Q.7 Attempt the following.**

Describe the working of direct linking loader & various data structures used in loader.

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**System Programming**

Day & Date: Saturday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A system program that sets up an executable program in main memory ready for execution
 

|              |                |
|--------------|----------------|
| a) Assembler | b) Linker      |
| c) Loader    | d) Load and go |
- 2) During macro expansion each statement is replaced by \_\_\_\_\_.
 

|                                       |
|---------------------------------------|
| a) The original program               |
| b) The sequence of assembly statement |
| c) By specific symbols                |
| d) None of the above                  |
- 3) A macro can be defined at \_\_\_\_\_.
 

|                                    |                          |
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| a) Beginning of a program          | b) End of a program      |
| c) After initialization of program | d) Anywhere in a program |
- 4) Macro processor is an inbuilt function of -
 

|              |           |
|--------------|-----------|
| a) Assembler | b) Loader |
| c) Linker    | d) Editor |
- 5) To overcome the problems of the assembler in dealing with branching code we use \_\_\_\_\_.
 

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| a) Interpreter  | b) Debugger          |
| c) Op-Assembler | d) Two-pass assemble |
- 6) Compiler can check \_\_\_\_\_.
 

|                                  |                      |
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| a) Syntax Error                  | b) Logical Error     |
| c) Both Logical and Syntax Error | d) None of the above |
- 7) Translator for low level programming language were termed as \_\_\_\_\_.
 

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| a) Assembler | b) Compiler |
| c) Linker    | d) Loader   |
- 8) The designer expresses the ideas in terms related to the \_\_\_\_\_.
 

|                       |                      |
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| a) application domain | b) execution domain  |
| c) all of the above   | d) none of the above |
- 9) The semantic gap has many consequences like \_\_\_\_\_.
 

|                             |                              |
|-----------------------------|------------------------------|
| a) large development time   | b) large development efforts |
| c) poor quality of software | d) all of the above          |



- 10)** Program generation activities and program execution activities are the processing activities that come under\_\_\_\_\_.
- a) Processing activities
  - b) Language processing activities
  - c) All of the above
  - d) None of the above
- 11)** Which of the following might be used to convert high-level language instructions into machine language?
- a) System software
  - b) Applications software
  - c) An operating environment
  - d) An interpreter
- 12)** Indicate which of the following is not true about an interpreter?
- a) Interpreter generates an object program from the source program
  - b) Interpreter is a kind of translator
  - c) Interpreter analyses each source statement every time it is to be executed
  - d) All of the above
- 13)** Which of the following program converts assembly language program to object programs?
- a) Assembler
  - b) Compiler
  - c) Macro processor
  - d) Linker
- 14)** \_\_\_\_\_ converts the programs written in assembly language into machine instructions.
- a) Machine compiler
  - b) Interpreter
  - c) Assembler
  - d) Converter

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**System Programming**

Day & Date: Saturday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Describe front end & back end of toy compiler with the help of examples.
- b) What is IR? Prepare an IR by making front end analysis of following program  
    P : integer;  
    Q, R: real;  
    Q: = R + P;
- c) List and explain types of elements of assembly language programming.
- d) Classify the fundamental language processing activities.
- e) Define and Describe Nested macro call.
- f) Define macro definition, call and expansion in detail with the help of examples.

**Q.3 Attempt any One.** **06**

- a) Define Language processor? List and explain different types of language processor with example.
- b) Write down the tasks performed in the analysis phase and synthesis phase of Assembler.

**Q.4 Attempt the following.** **06**

- a) List major issues in code generation for expression. Explain operand & register Descriptor with example.

**Section – II**

**Q.5 Attempt any Four** **16**

- a) Explain aspects of compilation.
- b) What are triples, quadruples and indirect triples? Explain.
- c) Define linker? And what are binary programs & object modules used in linker?
- d) What is absolute loader? How it differs from relocating loader.
- e) What is Loader? Explain the four basic functions of any loader.
- f) Compare linking address & loading address.

**Q.6 Attempt any one.**

- a)** Compare the direct linking and self relocating loader.
- b)** List & explain the PL features used in implementation of aspects of compilation.

**Q.7 Attempt the following.**

Describe the working of direct linking loader & various data structures used in loader.

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Day & Date: Saturday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Assume data wherever necessary.

Marks: 14

14

- Page 9 of 16

- 9) Indicate which of the following is not true about an interpreter?
- a) Interpreter generates an object program from the source program
  - b) Interpreter is a kind of translator
  - c) Interpreter analyses each source statement every time it is to be executed
  - d) All of the above
- 10) Which of the following program converts assembly language program to object programs?
- a) Assembler
  - b) Compiler
  - c) Macro processor
  - d) Linker
- 11) \_\_\_\_\_ converts the programs written in assembly language into machine instructions.
- a) Machine compiler
  - b) Interpreter
  - c) Assembler
  - d) Converter
- 12) A system program that sets up an executable program in main memory ready for execution
- a) Assembler
  - b) Linker
  - c) Loader
  - d) Load and go
- 13) During macro expansion each statement is replaced by \_\_\_\_\_.
- a) The original program
  - b) The sequence of assembly statement
  - c) By specific symbols
  - d) None of the above
- 14) A macro can be defined at \_\_\_\_\_.
- a) Beginning of a program
  - b) End of a program
  - c) After initialization of program
  - d) Anywhere in a program

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**System Programming**

Day & Date: Saturday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Describe front end & back end of toy compiler with the help of examples.
- b) What is IR? Prepare an IR by making front end analysis of following program  
     P : integer;  
     Q, R: real;  
     Q: = R + P;
- c) List and explain types of elements of assembly language programming.
- d) Classify the fundamental language processing activities.
- e) Define and Describe Nested macro call.
- f) Define macro definition, call and expansion in detail with the help of examples.

**Q.3 Attempt any One.** **06**

- a) Define Language processor? List and explain different types of language processor with example.
- b) Write down the tasks performed in the analysis phase and synthesis phase of Assembler.

**Q.4 Attempt the following.** **06**

- a) List major issues in code generation for expression. Explain operand & register Descriptor with example.

**Section – II**

**Q.5 Attempt any Four** **16**

- a) Explain aspects of compilation.
- b) What are triples, quadruples and indirect triples? Explain.
- c) Define linker? And what are binary programs & object modules used in linker?
- d) What is absolute loader? How it differs from relocating loader.
- e) What is Loader? Explain the four basic functions of any loader.
- f) Compare linking address & loading address.

**Q.6 Attempt any one.**

- a)** Compare the direct linking and self relocating loader.
- b)** List & explain the PL features used in implementation of aspects of compilation.

**Q.7 Attempt the following.**

Describe the working of direct linking loader & various data structures used in loader.

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**System Programming**

Day & Date: Saturday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following program converts assembly language program to object programs?
 

|                    |             |
|--------------------|-------------|
| a) Assembler       | b) Compiler |
| c) Macro processor | d) Linker   |
- 2) \_\_\_\_\_ converts the programs written in assembly language into machine instructions.
 

|                     |                |
|---------------------|----------------|
| a) Machine compiler | b) Interpreter |
| c) Assembler        | d) Converter   |
- 3) A system program that sets up an executable program in main memory ready for execution
 

|              |                |
|--------------|----------------|
| a) Assembler | b) Linker      |
| c) Loader    | d) Load and go |
- 4) During macro expansion each statement is replaced by \_\_\_\_\_.
 

|                                       |  |
|---------------------------------------|--|
| a) The original program               |  |
| b) The sequence of assembly statement |  |
| c) By specific symbols                |  |
| d) None of the above                  |  |
- 5) A macro can be defined at \_\_\_\_\_.
 

|                                    |                          |
|------------------------------------|--------------------------|
| a) Beginning of a program          | b) End of a program      |
| c) After initialization of program | d) Anywhere in a program |
- 6) Macro processor is an inbuilt function of -
 

|              |           |
|--------------|-----------|
| a) Assembler | b) Loader |
| c) Linker    | d) Editor |
- 7) To overcome the problems of the assembler in dealing with branching code we use \_\_\_\_\_.
 

|                 |                      |
|-----------------|----------------------|
| a) Interpreter  | b) Debugger          |
| c) Op-Assembler | d) Two-pass assemble |
- 8) Compiler can check \_\_\_\_\_.
 

|                                  |                      |
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| a) Syntax Error                  | b) Logical Error     |
| c) Both Logical and Syntax Error | d) None of the above |



- 9) Translator for low level programming language were termed as\_\_\_\_\_.
  - a) Assembler
  - b) Compiler
  - c) Linker
  - d) Loader
- 10) The designer expresses the ideas in terms related to the\_\_\_\_\_.
  - a) application domain
  - b) execution domain
  - c) all of the above
  - d) none of the above
- 11) The semantic gap has many consequences like \_\_\_\_\_.
  - a) large development time
  - b) large development efforts
  - c) poor quality of software
  - d) all of the above
- 12) Program generation activities and program execution activities are the processing activities that come under\_\_\_\_\_.
  - a) Processing activities
  - b) Language processing activities
  - c) All of the above
  - d) None of the above
- 13) Which of the following might be used to convert high-level language instructions into machine language?
  - a) System software
  - b) Applications software
  - c) An operating environment
  - d) An interpreter
- 14) Indicate which of the following is not true about an interpreter?
  - a) Interpreter generates an object program from the source program
  - b) Interpreter is a kind of translator
  - c) Interpreter analyses each source statement every time it is to be executed
  - d) All of the above

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**System Programming**

Day & Date: Saturday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
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**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Describe front end & back end of toy compiler with the help of examples.
- b) What is IR? Prepare an IR by making front end analysis of following program  
P : integer;  
Q, R: real;  
Q: = R + P;
- c) List and explain types of elements of assembly language programming.
- d) Classify the fundamental language processing activities.
- e) Define and Describe Nested macro call.
- f) Define macro definition, call and expansion in detail with the help of examples.

**Q.3 Attempt any One.** **06**

- a) Define Language processor? List and explain different types of language processor with example.
- b) Write down the tasks performed in the analysis phase and synthesis phase of Assembler.

**Q.4 Attempt the following.** **06**

- a) List major issues in code generation for expression. Explain operand & register Descriptor with example.

**Section – II**

**Q.5 Attempt any Four** **16**

- a) Explain aspects of compilation.
- b) What are triples, quadruples and indirect triples? Explain.
- c) Define linker? And what are binary programs & object modules used in linker?
- d) What is absolute loader? How it differs from relocating loader.
- e) What is Loader? Explain the four basic functions of any loader.
- f) Compare linking address & loading address.

**Q.6 Attempt any one.**

- a)** Compare the direct linking and self relocating loader.
- b)** List & explain the PL features used in implementation of aspects of compilation.

**Q.7 Attempt the following.**

Describe the working of direct linking loader & various data structures used in loader.

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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- Page 1 of 16

- 8) What is the reusable resource?
- a) that can be used by one process at a time and is not depleted that use
  - b) that can be used by more than one process at a time
  - c) that can be shared between various threads
  - d) none of the mentioned
- 9) Which one of the following is the deadlock avoidance algorithm?
- a) banker's algorithm
  - b) round-robin algorithm
  - c) elevator algorithm
  - d) kern's algorithm
- 10) CPI fetches the instruction from memory according to the value of
- a) program counter
  - b) status register
  - c) instruction register
  - d) program status word
- 11) Which one of the following is the address generated by CPU?
- a) physical address
  - b) absolute address
  - c) logical address
  - d) none of the mentioned
- 12) \_\_\_\_\_ is the concept in which a process is copied into main memory from the secondary memory according to the requirement.
- a) Paging
  - b) Demand paging
  - c) Segmentation
  - d) Swapping
- 13) In FIFO page replacement algorithm, when a page must be replaced \_\_\_\_\_.
- a) oldest page is chosen
  - b) newest page is chosen
  - c) random page is chosen
  - d) none of the mentioned
- 14) A \_\_\_\_\_ is a set of wires and a rigidly defined protocol that specifies a set of messages that can be sent on the wires.
- a) port
  - b) node
  - c) bus
  - d) none of the mentioned

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What is the major problem in Priority Scheduling? And how to solve it?
- What is a semaphore? Explain its operations.
- What is a process? Explain its state transition diagram.
- Explain Time-Sharing operating systems.
- Describe critical section problem. State the solution to CS problem.

**Q.3 Solve any two of the following questions. 16**

- Consider the following set of processes with arrival time and burst time in milliseconds as given below.

| P No. | AT | BT |
|-------|----|----|
| 1     | 0  | 7  |
| 2     | 1  | 5  |
| 3     | 2  | 3  |
| 4     | 3  | 1  |
| 5     | 4  | 2  |
| 6     | 5  | 1  |

- Draw Gantt chart that illustrate execution of processes in Pre-emptive SJF manner.
  - Calculate average waiting time for Pre-emptive SJF scheduling algorithm.
  - Calculate average Turnaround time for Pre-emptive SJF scheduling algorithm.
- What is process Scheduler? Describe long-term, short-term, and medium-term scheduler in detail.
  - Explain Monitor in detail.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- Explain deadlock prevention in detail
- Explain FIFO page replacement policy with example.
- Explain Swapping with the help of diagram.
- Write note on deadlock characterization.
- Write short note on application I/O interface.

**Q.6 Solve any two of the following questions.**

- a)** Write and explain Banker's algorithm for deadlock avoidance with the help of example.
- b)** Explain Paging in detail.
- c)** What is virtual memory? Explain demand paging in detail.

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) What is the reusable resource?
  - a) that can be used by one process at a time and is not depleted that use
  - b) that can be used by more than one process at a time
  - c) that can be shared between various threads
  - d) none of the mentioned
- 2) Which one of the following is the deadlock avoidance algorithm?
  - a) banker's algorithm
  - b) round-robin algorithm
  - c) elevator algorithm
  - d) kern's algorithm
- 3) CPI fetches the instruction from memory according to the value of
  - a) program counter
  - b) status register
  - c) instruction register
  - d) program status word
- 4) Which one of the following is the address generated by CPU?
  - a) physical address
  - b) absolute address
  - c) logical address
  - d) none of the mentioned
- 5) \_\_\_\_\_ is the concept in which a process is copied into main memory from the secondary memory according to the requirement.
  - a) Paging
  - b) Demand paging
  - c) Segmentation
  - d) Swapping
- 6) In FIFO page replacement algorithm, when a page must be replaced \_\_\_\_\_.
  - a) oldest page is chosen
  - b) newest page is chosen
  - c) random page is chosen
  - d) none of the mentioned
- 7) A \_\_\_\_\_ is a set of wires and a rigidly defined protocol that specifies a set of messages that can be sent on the wires.
  - a) port
  - b) node
  - c) bus
  - d) none of the mentioned





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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What is the major problem in Priority Scheduling? And how to solve it?
- What is a semaphore? Explain its operations.
- What is a process? Explain its state transition diagram.
- Explain Time-Sharing operating systems.
- Describe critical section problem. State the solution to CS problem.

**Q.3 Solve any two of the following questions. 16**

- Consider the following set of processes with arrival time and burst time in milliseconds as given below.

| P No. | AT | BT |
|-------|----|----|
| 1     | 0  | 7  |
| 2     | 1  | 5  |
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- Draw Gantt chart that illustrate execution of processes in Pre-emptive SJF manner.
  - Calculate average waiting time for Pre-emptive SJF scheduling algorithm.
  - Calculate average Turnaround time for Pre-emptive SJF scheduling algorithm.
- What is process Scheduler? Describe long-term, short-term, and medium-term scheduler in detail.
  - Explain Monitor in detail.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- Explain deadlock prevention in detail
- Explain FIFO page replacement policy with example.
- Explain Swapping with the help of diagram.
- Write note on deadlock characterization.
- Write short note on application I/O interface.

**Q.6 Solve any two of the following questions.**

- a)** Write and explain Banker's algorithm for deadlock avoidance with the help of example.
- b)** Explain Paging in detail.
- c)** What is virtual memory? Explain demand paging in detail.

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which one of the following is the address generated by CPU?
  - a) physical address
  - b) absolute address
  - c) logical address
  - d) none of the mentioned
- 2) \_\_\_\_\_ is the concept in which a process is copied into main memory from the secondary memory according to the requirement.
  - a) Paging
  - b) Demand paging
  - c) Segmentation
  - d) Swapping
- 3) In FIFO page replacement algorithm, when a page must be replaced \_\_\_\_\_.
  - a) oldest page is chosen
  - b) newest page is chosen
  - c) random page is chosen
  - d) none of the mentioned
- 4) A \_\_\_\_\_ is a set of wires and a rigidly defined protocol that specifies a set of messages that can be sent on the wires.
  - a) port
  - b) node
  - c) bus
  - d) none of the mentioned
- 5) The following C program:
 

```
main ()
{
fork(); fork(); printf("yes");
}
```

 prints yes:
  - a) only once
  - b) twice
  - c) four times
  - d) eight times
- 6) The state of a process is defined by :
  - a) the final activity of the process
  - b) the activity just executed by the process
  - c) next activity to be executed by the process
  - d) the current activity of the process
- 7) Which of the following do not belong to queues for processes?
  - a) Job Queue
  - b) PCB queue
  - c) Device Queue
  - d) Ready Queue



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Set **R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
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**Section – I**

**Q.2 Solve any three of the following questions.** **12**

- What is the major problem in Priority Scheduling? And how to solve it?
- What is a semaphore? Explain its operations.
- What is a process? Explain its state transition diagram.
- Explain Time-Sharing operating systems.
- Describe critical section problem. State the solution to CS problem.

**Q.3 Solve any two of the following questions.** **16**

- Consider the following set of processes with arrival time and burst time in milliseconds as given below.

| P No. | AT | BT |
|-------|----|----|
| 1     | 0  | 7  |
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- Draw Gantt chart that illustrate execution of processes in Pre-emptive SJF manner.
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- What is process Scheduler? Describe long-term, short-term, and medium-term scheduler in detail.
  - Explain Monitor in detail.

**Section – II**

**Q.4 Solve any three of the following questions.** **12**

- Explain deadlock prevention in detail
- Explain FIFO page replacement policy with example.
- Explain Swapping with the help of diagram.
- Write note on deadlock characterization.
- Write short note on application I/O interface.

**Q.6 Solve any two of the following questions.**

- a)** Write and explain Banker's algorithm for deadlock avoidance with the help of example.
- b)** Explain Paging in detail.
- c)** What is virtual memory? Explain demand paging in detail.

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The TestAndSet instruction is executed:
  - a) after a particular process
  - b) periodically
  - c) atomically
  - d) none of these
- 2) Round robin scheduling falls under the category of:
  - a) Non preemptive scheduling
  - b) Preemptive scheduling
  - c) None of these
  - d) Both (a) and (b)
- 3) What is the reusable resource?
  - a) that can be used by one process at a time and is not depleted that use
  - b) that can be used by more than one process at a time
  - c) that can be shared between various threads
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  - a) oldest page is chosen
  - b) newest page is chosen
  - c) random page is chosen
  - d) none of the mentioned



- 9) A \_\_\_\_\_ is a set of wires and a rigidly defined protocol that specifies a set of messages that can be sent on the wires.
- |         |                          |
|---------|--------------------------|
| a) port | b) node                  |
| c) bus  | d) none of the mentioned |
- 10) The following C program:
- ```
main ()  
{  
fork(); fork(); printf("yes");  
}
```
- prints yes:
- |               |                |
|---------------|----------------|
| a) only once  | b) twice       |
| c) four times | d) eight times |
- 11) The state of a process is defined by :
- |  |
|--|
| a) the final activity of the process           |
| b) the activity just executed by the process   |
| c) next activity to be executed by the process |
| d) the current activity of the process         |
- 12) Which of the following do not belong to queues for processes?
- |                 |                |
|-----------------|----------------|
| a) Job Queue    | b) PCB queue   |
| c) Device Queue | d) Ready Queue |
- 13) Mutual exclusion can be provided by the \_\_\_\_\_.
- |                     |                      |
|---------------------|----------------------|
| a) mutex locks      | b) binary semaphores |
| c) both (a) and (b) | d) none of the above |
- 14) Cascading termination refers to termination of all child processes before the parent terminates \_\_\_\_\_.
- |                           |                  |
|---------------------------|------------------|
| a) Normally               | b) Abnormally    |
| c) Normally or abnormally | d) None of these |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What is the major problem in Priority Scheduling? And how to solve it?
- What is a semaphore? Explain its operations.
- What is a process? Explain its state transition diagram.
- Explain Time-Sharing operating systems.
- Describe critical section problem. State the solution to CS problem.

**Q.3 Solve any two of the following questions. 16**

- Consider the following set of processes with arrival time and burst time in milliseconds as given below.

P No.	AT	BT
1	0	7
2	1	5
3	2	3
4	3	1
5	4	2
6	5	1

- Draw Gantt chart that illustrate execution of processes in Pre-emptive SJF manner.
  - Calculate average waiting time for Pre-emptive SJF scheduling algorithm.
  - Calculate average Turnaround time for Pre-emptive SJF scheduling algorithm.
- What is process Scheduler? Describe long-term, short-term, and medium-term scheduler in detail.
  - Explain Monitor in detail.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- Explain deadlock prevention in detail
- Explain FIFO page replacement policy with example.
- Explain Swapping with the help of diagram.
- Write note on deadlock characterization.
- Write short note on application I/O interface.

**Q.6 Solve any two of the following questions.**

- a)** Write and explain Banker's algorithm for deadlock avoidance with the help of example.
- b)** Explain Paging in detail.
- c)** What is virtual memory? Explain demand paging in detail.

Seat No.	
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Set P
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The second step in software development life cycle is \_\_\_\_\_.  
 a) System Design  
 b) Requirement analysis and specification  
 c) System Testing  
 d) Coding
- 2) SDLC stands for \_\_\_\_\_.  
 a) System Development Life cycle  
 b) Software Development Life cycle  
 c) Software Design Life Cycle  
 d) System Design Life Cycle
- 3) An SRS provides a reference for \_\_\_\_\_ of the final product.  
 a) Verification  
 b) Implementation  
 c) Validation  
 d) Justification
- 4) \_\_\_\_\_ is one of the characteristics of software process.  
 a) Maintainability  
 b) Efficiency  
 c) Reliability  
 d) Predictability
- 5) A \_\_\_\_\_ is a systematic approach to creating a design by applying of a set of techniques and guidelines.  
 a) design methodology  
 b) Validation  
 c) Testing  
 d) Coding
- 6) \_\_\_\_\_ coupling occurs due to methods of a class invoking methods of other classes.  
 a) Component  
 b) Interaction  
 c) Inheritance  
 d) Simple
- 7) \_\_\_\_\_ cohesion occurs when there is no meaningful relationship among the elements of a module.  
 a) Logical  
 b) Temporal  
 c) Coincidental  
 d) Sequential



<b>Seat No.</b>	
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**Set****P**

**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Engineering**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any three questions. 12**

- a) What are the different characteristics of a software process?
- b) What are the different components of SRS?
- c) Describe waterfall model of software development in detail.
- d) How design principles used in function and object-oriented design.
- e) What is cohesion? Describe all types of cohesion used in design.

**Q.3 Answer any two questions. 16**

- a) What is SRS? Explain different need and characteristics of SRS.
- b) Describe Spiral model of software development in detail.
- c) Explain design principles used in function and object-oriented design.

**Section – II**

**Q.4 Answer any three questions. 12**

- a) Describe about quality concept in software project.
- b) What is process capability baseline in project planning?
- c) Describe black box testing in detail.
- d) Explain Capability Maturity Model (CMM) in detail.
- e) Describe new management responsibilities in agile project management.

**Q.5 Answer any two questions. 16**

- a) How effort estimation and scheduling is applied in software project?
- b) Describe Adaptive project management life cycle in detail.
- c) Describe white box testing in detail.

<b>Seat No.</b>	
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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- Page 4 of 12

- 7) White Box Testing is also called as \_\_\_\_\_.  
a) functional testing                      b) structural testing  
c) stress testing                            d) interface testing
- 8) The second step in software development life cycle is \_\_\_\_\_.  
a) System Design  
b) Requirement analysis and specification  
c) System Testing  
d) Coding
- 9) SDLC stands for \_\_\_\_\_.  
a) System Development Life cycle  
b) Software Development Life cycle  
c) Software Design Life Cycle  
d) System Design Life Cycle
- 10) An SRS provides a reference for \_\_\_\_\_ of the final product.  
a) Verification                              b) Implementation  
c) Validation                                d) Justification
- 11) \_\_\_\_\_ is one of the characteristics of software process.  
a) Maintainability                          b) Efficiency  
c) Reliability                                d) Predictability
- 12) A \_\_\_\_\_ is a systematic approach to creating a design by applying of a set of techniques and guidelines.  
a) design methodology  
b) Validation  
c) Testing  
d) Coding
- 13) \_\_\_\_\_ coupling occurs due to methods of a class invoking methods of other classes.  
a) Component                              b) Interaction  
c) Inheritance                               d) Simple
- 14) \_\_\_\_\_ cohesion occurs when there is no meaningful relationship among the elements of a module.  
a) Logical                                      b) Temporal  
c) Coincidental                               d) Sequential



<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Engineering**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any three questions. 12**

- a) What are the different characteristics of a software process?
- b) What are the different components of SRS?
- c) Describe waterfall model of software development in detail.
- d) How design principles used in function and object-oriented design.
- e) What is cohesion? Describe all types of cohesion used in design.

**Q.3 Answer any two questions. 16**

- a) What is SRS? Explain different need and characteristics of SRS.
- b) Describe Spiral model of software development in detail.
- c) Explain design principles used in function and object-oriented design.

**Section – II**

**Q.4 Answer any three questions. 12**

- a) Describe about quality concept in software project.
- b) What is process capability baseline in project planning?
- c) Describe black box testing in detail.
- d) Explain Capability Maturity Model (CMM) in detail.
- e) Describe new management responsibilities in agile project management.

**Q.5 Answer any two questions. 16**

- a) How effort estimation and scheduling is applied in software project?
- b) Describe Adaptive project management life cycle in detail.
- c) Describe white box testing in detail.

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) CMM means \_\_\_\_\_.  
 a) Common Maturity Model  
 b) Cost Maturity Model  
 c) Capability Maturity Model  
 d) All
- 2) The weakness of the \_\_\_\_\_ model is it requires co-located teams in Agile Project Management.  
 a) Adaptive PMLC  
 b) Prototype  
 c) Linear  
 d) Iterative PMLC
- 3) \_\_\_\_\_ analysis is the key to learning from the past so to provide future improvements.  
 a) Project closure  
 b) Functional closure  
 c) Quality closure  
 d) Risk
- 4) White Box Testing is also called as \_\_\_\_\_.  
 a) functional testing  
 b) structural testing  
 c) stress testing  
 d) interface testing
- 5) The second step in software development life cycle is \_\_\_\_\_.  
 a) System Design  
 b) Requirement analysis and specification  
 c) System Testing  
 d) Coding
- 5) SDLC stands for \_\_\_\_\_.  
 a) System Development Life cycle  
 b) Software Development Life cycle  
 c) Software Design Life Cycle  
 d) System Design Life Cycle
- 7) An SRS provides a reference for \_\_\_\_\_ of the final product.  
 a) Verification  
 b) Implementation  
 c) Validation  
 d) Justification

- 8) \_\_\_\_\_ is one of the characteristics of software process.
- a) Maintainability
  - b) Efficiency
  - c) Reliability
  - d) Predictability
- 9) A \_\_\_\_\_ is a systematic approach to creating a design by applying of a set of techniques and guidelines.
- a) design methodology
  - b) Validation
  - c) Testing
  - d) Coding
- 10) \_\_\_\_\_ coupling occurs due to methods of a class invoking methods of other classes.
- a) Component
  - b) Interaction
  - c) Inheritance
  - d) Simple
- 11) \_\_\_\_\_ cohesion occurs when there is no meaningful relationship among the elements of a module.
- a) Logical
  - b) Temporal
  - c) Coincidental
  - d) Sequential
- 12) Black box testing is also called as \_\_\_\_\_.
- a) structural testing
  - b) interface testing
  - c) stress testing
  - d) Functional testing
- 13) A detailed project schedule is never \_\_\_\_\_.
- a) fixed
  - b) variable
  - c) dynamic
  - d) static
- 14) \_\_\_\_\_ is defined as the auditing and reporting procedures used to provide the stakeholders with data needed to make well-informed decisions.
- a) Quality control
  - b) Quality Assurance
  - c) Quality assessment
  - d) None of these

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Engineering**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any three questions. 12**

- a) What are the different characteristics of a software process?
- b) What are the different components of SRS?
- c) Describe waterfall model of software development in detail.
- d) How design principles used in function and object-oriented design.
- e) What is cohesion? Describe all types of cohesion used in design.

**Q.3 Answer any two questions. 16**

- a) What is SRS? Explain different need and characteristics of SRS.
- b) Describe Spiral model of software development in detail.
- c) Explain design principles used in function and object-oriented design.

**Section – II**

**Q.4 Answer any three questions. 12**

- a) Describe about quality concept in software project.
- b) What is process capability baseline in project planning?
- c) Describe black box testing in detail.
- d) Explain Capability Maturity Model (CMM) in detail.
- e) Describe new management responsibilities in agile project management.

**Q.5 Answer any two questions. 16**

- a) How effort estimation and scheduling is applied in software project?
- b) Describe Adaptive project management life cycle in detail.
- c) Describe white box testing in detail.

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) \_\_\_\_\_ coupling occurs due to methods of a class invoking methods of other classes.
 

a) Component	b) Interaction
c) Inheritance	d) Simple
- 2) \_\_\_\_\_ cohesion occurs when there is no meaningful relationship among the elements of a module.
 

a) Logical	b) Temporal
c) Coincidental	d) Sequential
- 3) Black box testing is also called as \_\_\_\_\_.
 

a) structural testing	b) interface testing
c) stress testing	d) Functional testing
- 4) A detailed project schedule is never \_\_\_\_\_.
 

a) fixed
b) variable
c) dynamic
d) static
- 5) \_\_\_\_\_ is defined as the auditing and reporting procedures used to provide the stakeholders with data needed to make well-informed decisions.
 

a) Quality control
b) Quality Assurance
c) Quality assessment
d) None of these
- 6) CMM means \_\_\_\_\_.
 

a) Common Maturity Model
b) Cost Maturity Model
c) Capability Maturity Model
d) All

- 7) The weakness of the \_\_\_\_\_ model is it requires co-located teams in Agile Project Management.
- a) Adaptive PMLC
  - b) Prototype
  - c) Linear
  - d) Iterative PMLC
- 8) \_\_\_\_\_ analysis is the key to learning from the past so to provide future improvements.
- a) Project closure
  - b) Functional closure
  - c) Quality closure
  - d) Risk
- 9) White Box Testing is also called as \_\_\_\_\_.
- a) functional testing
  - b) structural testing
  - c) stress testing
  - d) interface testing
- 10) The second step in software development life cycle is \_\_\_\_\_.
- a) System Design
  - b) Requirement analysis and specification
  - c) System Testing
  - d) Coding
- 11) SDLC stands for \_\_\_\_\_.
- a) System Development Life cycle
  - b) Software Development Life cycle
  - c) Software Design Life Cycle
  - d) System Design Life Cycle
- 12) An SRS provides a reference for \_\_\_\_\_ of the final product.
- a) Verification
  - b) Implementation
  - c) Validation
  - d) Justification
- 13) \_\_\_\_\_ is one of the characteristics of software process.
- a) Maintainability
  - b) Efficiency
  - c) Reliability
  - d) Predictability
- 14) A \_\_\_\_\_ is a systematic approach to creating a design by applying of a set of techniques and guidelines.
- a) design methodology
  - b) Validation
  - c) Testing
  - d) Coding

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Engineering**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any three questions. 12**

- a) What are the different characteristics of a software process?
- b) What are the different components of SRS?
- c) Describe waterfall model of software development in detail.
- d) How design principles used in function and object-oriented design.
- e) What is cohesion? Describe all types of cohesion used in design.

**Q.3 Answer any two questions. 16**

- a) What is SRS? Explain different need and characteristics of SRS.
- b) Describe Spiral model of software development in detail.
- c) Explain design principles used in function and object-oriented design.

**Section – II**

**Q.4 Answer any three questions. 12**

- a) Describe about quality concept in software project.
- b) What is process capability baseline in project planning?
- c) Describe black box testing in detail.
- d) Explain Capability Maturity Model (CMM) in detail.
- e) Describe new management responsibilities in agile project management.

**Q.5 Answer any two questions. 16**

- a) How effort estimation and scheduling is applied in software project?
- b) Describe Adaptive project management life cycle in detail.
- c) Describe white box testing in detail.

Seat No.	
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Set

P

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**\$ Database Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A view of database that appears to an application program is known as:
  - a) Schema
  - b) Subschema
  - c) Virtual table
  - d) None of the above
- 2) An abstraction concept for building composite object from their component is called:
  - a) Specialization
  - b) Normalization
  - c) Generalization
  - d) Aggregation
- 3) Let  $R = (A, B, C, D)$  and  $F = \{A \rightarrow B, A \rightarrow C, BC \rightarrow D\}$  then  $A \rightarrow D$  is in  $F^+$ . Then which of following is correct?
  - a)  $A \rightarrow D$  in  $F^+$  is always true
  - b)  $A \rightarrow D$  is in  $F^+$  but for that  $D \rightarrow A$  must be satisfied
  - c)  $A \rightarrow D$  is not in  $F^+$
  - d) None of these
- 4) The output of Data Definition Language (DDL) is stored in
  - a) Relation
  - b) Cache
  - c) Data dictionary
  - d) E-R diagram
- 5) Rename is binary operation
  - a) True
  - b) False
- 6) We say that a relation schema  $R$  is in first normal form (1 NF) if \_\_\_\_\_.
  - a) The domains of all attributes of  $R$  are atomic
  - b) The relation schema do not allow NULL values
  - c) The relation schema do not allow NULL attributes
  - d) The relation schema has a foreign key
- 7) In SQL, which command is used to remove rows from a table?
  - a) DELETE
  - b) REMOVE
  - c) TRUNCATE
  - d) Both a and c



- 8) \_\_\_\_\_ index has an index entry search key value in the data file.
- a) Sparse
  - b) Dense
  - c) Both a and b
  - d) None
- 9) Consider two statements for two-phase locking protocol
- S1: In growing phase a transaction may obtain locks
- S2: In growing phase a transaction may not release any lock
- a) Both S1 and S2 are true
  - b) Only S1 is true
  - c) Only S2 is true
  - d) Both S1 and S2 are false
- 10) Which of the log is not in transaction state?
- a) Start
  - b) Write
  - c) Rollback
  - d) Commit
- 11) Check-point are used for
- a) Transaction recovery
  - b) Transaction concurrency control
  - c) Designing serializable schedule
  - d) Designing optimized query
- 12) For the B+ tree, following is true
- a) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $n^2$  children
  - b) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $\lceil n/4 \rceil$  children
  - c) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $n$  children
  - d) Each no-leaf node has same number of children
- 13) Which of the following scenarios lead to an non-recoverable schedule?
- a) A transaction writes a data item after it is read by an uncommitted transaction
  - b) A transaction reads a data item after it is read by an uncommitted transaction
  - c) A transaction reads a data item after it is written by an committed transaction
  - d) A transaction reads a data item after it is written by an uncommitted transaction
- 14) In a two-phase locking protocol, a transaction \_\_\_\_\_downgrade a write lock to a read lock.
- a) Cannot, in the growing phase only
  - b) Can under all circumstances
  - c) Can in the shrinking phase only
  - d) Cannot in the shrinking phase only

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**\$ Database Engineering**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any three from the following. 12**

- a) Explain with example various attributes types in ER model.
- b) Explain with example Generalization and Specialization.
- c) Explain with example dependency preservation.
- d) Explain with example Third Normal Form (3NF).
- e) Explain cardinality constraints and participating constraints.

**Q.3 Attempt any two from the following. 16**

- a) What is functional dependency? Explain the way to find closure of a set of functional dependency.
- b) Explain fundamental relational algebra operations with examples.
- c) List and explain drawbacks of file processing system.

**Section – II**

**Q.4 Attempt any three from the following. 12**

- a) Explain transaction model with example.
- b) Explain the concept of shadow paging.
- c) Explain deferred database modifications with example.
- d) Explain Dense and Sparse Indexing with suitable diagram.
- e) Give difference between Ordered indices and Hashing with one example. Which is better to use.

**Q.5 Attempt any two from the following. 16**

- a) Explain two-phase protocol in detail.
- b) List the ACID properties and explain each property in detail with a suitable example.
- c) Explain in detail the concept of check points in recovery systems.

Seat No.	
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Set Q
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**\$ Database Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ index has an index entry search key value in the data file.
  - a) Sparse
  - b) Dense
  - c) Both a and b
  - d) None
- 2) Consider two statements for two-phase locking protocol  
 S1: In growing phase a transaction may obtain locks  
 S2: In growing phase a transaction may not release any lock
  - a) Both S1 and S2 are true
  - b) Only S1 is true
  - c) Only S2 is true
  - d) Both S1 and S2 are false
- 3) Which of the log is not in transaction state?
  - a) Start
  - b) Write
  - c) Rollback
  - d) Commit
- 4) Check-point are used for
  - a) Transaction recovery
  - b) Transaction concurrency control
  - c) Designing serializable schedule
  - d) Designing optimized query
- 5) For the B+ tree, following is true
  - a) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $n^2$  children
  - b) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $\lceil n/4 \rceil$  children
  - c) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $n$  children
  - d) Each no-leaf node has same number of children
- 6) Which of the following scenarios lead to an non-recoverable schedule?
  - a) A transaction writes a data item after it is read by an uncommitted transaction
  - b) A transaction reads a data item after it is read by an uncommitted transaction
  - c) A transaction reads a data item after it is written by an committed transaction
  - d) A transaction reads a data item after it is written by an uncommitted transaction

- 7) In a two-phase locking protocol, a transaction \_\_\_\_\_downgrade a write lock to a read lock.
- a) Cannot, in the growing phase only
  - b) Can under all circumstances
  - c) Can in the shrinking phase only
  - d) Cannot in the shrinking phase only
- 8) A view of database that appears to an application program is known as:
- a) Schema
  - b) Subschema
  - c) Virtual table
  - d) None of the above
- 9) An abstraction concept for building composite object from their component is called:
- a) Specialization
  - b) Normalization
  - c) Generalization
  - d) Aggregation
- 10) Let  $R = (A, B, C, D)$  and  $F = \{A \rightarrow B, A \rightarrow C, BC \rightarrow D\}$  then  $A \rightarrow D$  is in  $F^+$ . Then which of following is correct?
- a)  $A \rightarrow D$  in  $F^+$  is always true
  - b)  $A \rightarrow D$  is in  $F^+$  but for that  $D \rightarrow A$  must be satisfied
  - c)  $A \rightarrow D$  is not in  $F^+$
  - d) None of these
- 11) The output of Data Definition Language (DDL) is stored in
- a) Relation
  - b) Cache
  - c) Data dictionary
  - d) E-R diagram
- 12) Rename is binary operation
- a) True
  - b) False
- 13) We say that a relation schema  $R$  is in first normal form (1 NF) if \_\_\_\_\_
- a) The domains of all attributes of  $R$  are atomic
  - b) The relation schema do not allow NULL values
  - c) The relation schema do not allow NULL attributes
  - d) The relation schema has a foreign key
- 14) In SQL, which command is used to remove rows from a table?
- a) DELETE
  - b) REMOVE
  - c) TRUNCATE
  - d) Both a and c

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**\$ Database Engineering**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any three from the following. 12**

- a) Explain with example various attributes types in ER model.
- b) Explain with example Generalization and Specialization.
- c) Explain with example dependency preservation.
- d) Explain with example Third Normal Form (3NF).
- e) Explain cardinality constraints and participating constraints.

**Q.3 Attempt any two from the following. 16**

- a) What is functional dependency? Explain the way to find closure of a set of functional dependency.
- b) Explain fundamental relational algebra operations with examples.
- c) List and explain drawbacks of file processing system.

**Section – II**

**Q.4 Attempt any three from the following. 12**

- a) Explain transaction model with example.
- b) Explain the concept of shadow paging.
- c) Explain deferred database modifications with example.
- d) Explain Dense and Sparse Indexing with suitable diagram.
- e) Give difference between Ordered indices and Hashing with one example. Which is better to use.

**Q.5 Attempt any two from the following. 16**

- a) Explain two-phase protocol in detail.
- b) List the ACID properties and explain each property in detail with a suitable example.
- c) Explain in detail the concept of check points in recovery systems.

Seat No.	
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Set R
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**\$ Database Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Check-point are used for
  - a) Transaction recovery
  - b) Transaction concurrency control
  - c) Designing serializable schedule
  - d) Designing optimized query
- 2) For the B+ tree, following is true
  - a) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $n^2$  children
  - b) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $\lceil n/4 \rceil$  children
  - c) Each no-leaf node has between  $\lceil n/2 \rceil$  to  $n$  children
  - d) Each no-leaf node has same number of children
- 3) Which of the following scenarios lead to an non-recoverable schedule?
  - a) A transaction writes a data item after it is read by an uncommitted transaction
  - b) A transaction reads a data item after it is read by an uncommitted transaction
  - c) A transaction reads a data item after it is written by an committed transaction
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- 4) In a two-phase locking protocol, a transaction \_\_\_\_\_downgrade a write lock to a read lock.
  - a) Cannot, in the growing phase only
  - b) Can under all circumstances
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- 5) A view of database that appears to an application program is known as:
  - a) Schema
  - b) Subschema
  - c) Virtual table
  - d) None of the above

- 6) An abstraction concept for building composite object from their component is called:
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  - b) Normalization
  - c) Generalization
  - d) Aggregation
- 7) Let  $R = (A, B, C, D)$  and  $F = \{A \rightarrow B, A \rightarrow C, BC \rightarrow D\}$  then  $A \rightarrow D$  is in  $F^+$ . Then which of following is correct?
- a)  $A \rightarrow D$  in  $F^+$  is always true
  - b)  $A \rightarrow D$  is in  $F^+$  but for that  $D \rightarrow A$  must be satisfied
  - c)  $A \rightarrow D$  is not in  $F^+$
  - d) None of these
- 8) The output of Data Definition Language (DDL) is stored in
- a) Relation
  - b) Cache
  - c) Data dictionary
  - d) E-R diagram
- 9) Rename is binary operation
- a) True
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- 10) We say that a relation schema  $R$  is in first normal form (1 NF) if \_\_\_\_\_
- a) The domains of all attributes of  $R$  are atomic
  - b) The relation schema do not allow NULL values
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  - d) The relation schema has a foreign key
- 11) In SQL, which command is used to remove rows from a table?
- a) DELETE
  - b) REMOVE
  - c) TRUNCATE
  - d) Both a and c
- 12) \_\_\_\_\_ index has an index entry search key value in the data file.
- a) Sparse
  - b) Dense
  - c) Both a and b
  - d) None
- 13) Consider two statements for two-phase locking protocol
- S1: In growing phase a transaction may obtain locks
- S2: In growing phase a transaction may not release any lock
- a) Both S1 and S2 are true
  - b) Only S1 is true
  - c) Only S2 is true
  - d) Both S1 and S2 are false
- 14) Which of the log is not in transaction state?
- a) Start
  - b) Write
  - c) Rollback
  - d) Commit

Seat No.	
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**\$ Database Engineering**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any three from the following. 12**

- Explain with example various attributes types in ER model.
- Explain with example Generalization and Specialization.
- Explain with example dependency preservation.
- Explain with example Third Normal Form (3NF).
- Explain cardinality constraints and participating constraints.

**Q.3 Attempt any two from the following. 16**

- What is functional dependency? Explain the way to find closure of a set of functional dependency.
- Explain fundamental relational algebra operations with examples.
- List and explain drawbacks of file processing system.

**Section – II**

**Q.4 Attempt any three from the following. 12**

- Explain transaction model with example.
- Explain the concept of shadow paging.
- Explain deferred database modifications with example.
- Explain Dense and Sparse Indexing with suitable diagram.
- Give difference between Ordered indices and Hashing with one example. Which is better to use.

**Q.5 Attempt any two from the following. 16**

- Explain two-phase protocol in detail.
- List the ACID properties and explain each property in detail with a suitable example.
- Explain in detail the concept of check points in recovery systems.



Seat No.	
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**\$ Database Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) We say that a relation schema R is in first normal form (1 NF) if \_\_\_\_\_  
 a) The domains of all attributes of R are atomic  
 b) The relation schema do not allow NULL values  
 c) The relation schema do not allow NULL attributes  
 d) The relation schema has a foreign key
- 2) In SQL, which command is used to remove rows from a table?  
 a) DELETE  
 b) REMOVE  
 c) TRUNCATE  
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 a) Sparse  
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 a) Both S1 and S2 are true  
 b) Only S1 is true  
 c) Only S2 is true  
 d) Both S1 and S2 are false
- 5) Which of the log is not in transaction state?  
 a) Start  
 b) Write  
 c) Rollback  
 d) Commit
- 6) Check-point are used for  
 a) Transaction recovery  
 b) Transaction concurrency control  
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 d) Designing optimized query
- 7) For the B+ tree, following is true  
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  - c)  $A \rightarrow D$  is not in  $F^+$
  - d) None of these
- 13) The output of Data Definition Language (DDL) is stored in
- a) Relation
  - b) Cache
  - c) Data dictionary
  - d) E-R diagram
- 14) Rename is binary operation
- a) True
  - b) False

Seat No.	
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**\$ Database Engineering**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any three from the following. 12**

- Explain with example various attributes types in ER model.
- Explain with example Generalization and Specialization.
- Explain with example dependency preservation.
- Explain with example Third Normal Form (3NF).
- Explain cardinality constraints and participating constraints.

**Q.3 Attempt any two from the following. 16**

- What is functional dependency? Explain the way to find closure of a set of functional dependency.
- Explain fundamental relational algebra operations with examples.
- List and explain drawbacks of file processing system.

**Section – II**

**Q.4 Attempt any three from the following. 12**

- Explain transaction model with example.
- Explain the concept of shadow paging.
- Explain deferred database modifications with example.
- Explain Dense and Sparse Indexing with suitable diagram.
- Give difference between Ordered indices and Hashing with one example. Which is better to use.

**Q.5 Attempt any two from the following. 16**

- Explain two-phase protocol in detail.
- List the ACID properties and explain each property in detail with a suitable example.
- Explain in detail the concept of check points in recovery systems.

Seat No.	
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Time Complexity is \_\_\_\_\_
  - a) Space required by program
  - b) Amount of machine time necessary for running program
  - c) Time required for programmer to code
  - d) All of above
- 2) Algorithm A is said to be \_\_\_\_\_ recursive if it call another algorithm which in turn calls A.
 

a) Indirect	b) Direct
c) Pointed	d) Related
- 3) \_\_\_\_\_ method is used for solving recurrence relation.
 

a) Division	b) Substitution
c) Replacement	d) None of these
- 4) For merging two sorted listed list of sizes m and n into sorted list of size m + n, we require comparison of \_\_\_\_\_.
 

a) $O(m + n)$	b) $O(m)$
c) $O(n)$	d) $O(\log m + \log n)$
- 5) Which of the following sorting algorithms has the lowest worst-case complexity?
 

a) Merge sort	b) Bubble sort
c) Quick sort	d) Selection sort
- 6) Job sequencing with deadlines is an example of \_\_\_\_\_ greedy method.
 

a) subset paradigm	b) ordering paradigm
c) both a) and c)	d) none of the above
- 7) In an optimal storage on tape problem if  $(\lambda_1, \lambda_2, \lambda_3) = (5, 10, 3)$  then the optimal ordering of program is
 

a) 1, 2, 3	b) 3, 1, 2
c) 2, 3, 1	d) 1, 3, 2
- 8) Which algorithm design technique is the most efficient one for solving the problem of real knapsack?
 

a) Enumerating strategy	b) Divide and conquer
c) Greedy strategy	d) Backtracking

- 9) Which one of the following algorithm design techniques is used in finding all pairs of shortest distance in Graph?
- a) Dynamic programming
  - b) Backtracking
  - c) Greedy method
  - d) Divide and conquer
- 10) \_\_\_\_\_ is a generated node which is too expanded further or all of whose children have been generated.
- a) Live node
  - b) E-node
  - c) Dead ode
  - d) Root Node
- 11) The smallest number of colors needed to color a graph G is called its \_\_\_\_
- a) Face number
  - b) Chromatic number
  - c) Edges number
  - d) Vertex number
- 12) If a problem Q is known to be NP-hard, then which of the following is true?
- a) If Q is in NP then Q is NP-complete
  - b) Q is not NP-complete
  - c) Q is not in NP
  - d) Not all problem is NP can be reduce to Q
- 13) A problem is NP-Complete if the problem is \_\_\_\_\_
- a) NP-Hard
  - b) P only
  - c) P Hard and in NP
  - d) NP Hard but not in NP
- 14) Which of the following statements are true?
- 1) The problem of determining whether there exists a cycle in an undirected graph is in P
  - 2) The problem of determining whether there exists a cycle in an undirected graph is in NP
  - 3) If a problem A is NP-complete, there exists a non-deterministic polynomial time algorithm to solve A
- a) 1, 2 and 3
  - b) 1 and 3
  - c) 2 only
  - d) 3 only

Seat  
No.

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**SECTION – I****Q.2 Solve any four questions.****20**

- Define space and time complexity with suitable example.
- State and prove time complexity of Merge sort.
- Explain Binary Search with suitable example.
- Using Greedy approach find maximum profit earned for the given Knapsack problem.

Profit = (12,10,8,11,14,7,9)

Weight = (4,6,5,7,3,1,6)

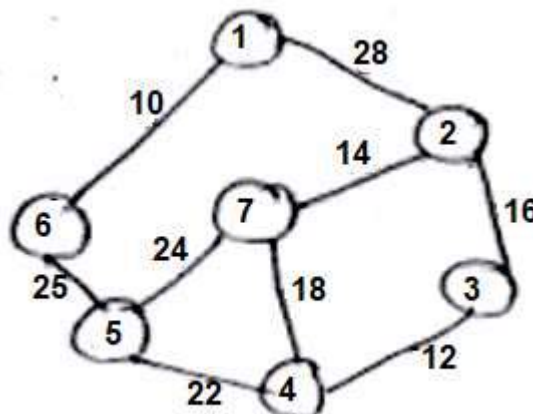
M=18

e)	Symbol	Frequency
	A	70 Million
	B	3 Million
	C	20 Million
	D	37 Million

Find decode tree and code for particular symbol.

**Q.3 Solve any One.****08**

- Sort following elements using Quick sort (Show each iteration).  
65, 70, 75, 80, 85, 60, 55, 50, 45
- Find the minimum cost spanning tree using Prims and Kruskals algorithm.  
(show each iteration)

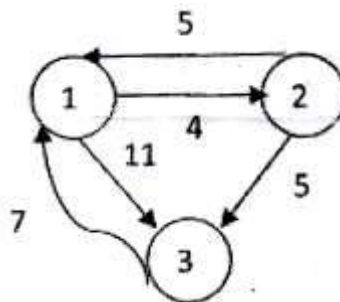


## SECTION – II

20

## Q.4 Attempt any Four.

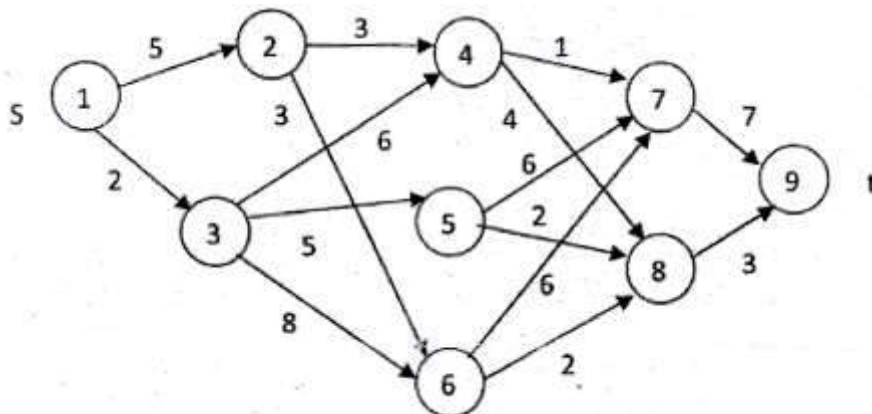
- Write a note on – Reliability design.
- Solve 0/1 Knapsack problem using Dynamic Programming  
 $N = 3$ ,  $m = 6$  profit =  $\{1, 2, 5\}$  and weight =  $\{2, 3, 4\}$
- Draw portion of solution space tree for 4- Queen problem using backtracking.
- Explain Hamilton cycle.
- Define P, NP, NP-hard problem.
- Find all pair shortest path using dynamic programming for following diagram



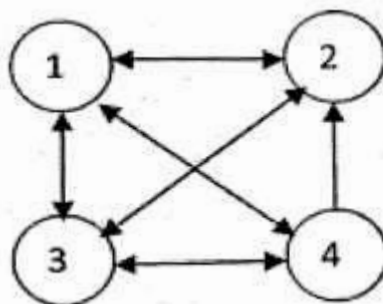
## Q.5 Attempt any One.

08

- Find the minimum cost from s to t in multistage graph using backward approach.



- Consider following directed graph and edge lengths are given by matrix. Find optimal tour travelling sales person.



0	10	15	20
5	0	9	10
6	13	0	12
8	8	9	0

Seat No.	
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Set Q
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Thursday, 09-02-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Which algorithm design technique is the most efficient one for solving the problem of real knapsack?
 

a) Enumerating strategy	b) Divide and conquer
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- 2) Which one of the following algorithm design techniques is used in finding all pairs of shortest distance in Graph?
 

a) Dynamic programming	b) Backtracking
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- 4) The smallest number of colors needed to color a graph G is called its \_\_\_\_
 

a) Face number	b) Chromatic number
c) Edges number	d) Vertex number
- 5) If a problem Q is known to be NP-hard, then which of the following is true?
 

a) If Q is in NP then Q is NP-complete
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c) Q is not in NP
d) Not all problem in NP can be reduce to Q
- 6) A problem is NP-Complete if the problem is \_\_\_\_
 

a) NP-Hard	b) P only
c) P Hard and in NP	d) NP Hard but not in NP





Seat  
No.

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
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Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

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- State and prove time complexity of Merge sort.
- Explain Binary Search with suitable example.
- Using Greedy approach find maximum profit earned for the given Knapsack problem.

Profit = (12,10,8,11,14,7,9)

Weight = (4,6,5,7,3,1,6)

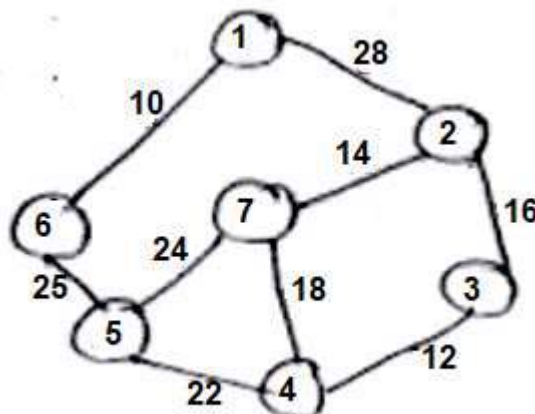
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e)	Symbol	Frequency
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	D	37 Million

Find decode tree and code for particular symbol.

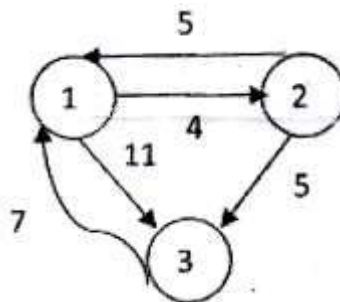
**Q.3 Solve any One.****08**

- Sort following elements using Quick sort (Show each iteration).  
65, 70, 75, 80, 85, 60, 55, 50, 45
- Find the minimum cost spanning tree using Prims and Kruskals algorithm.  
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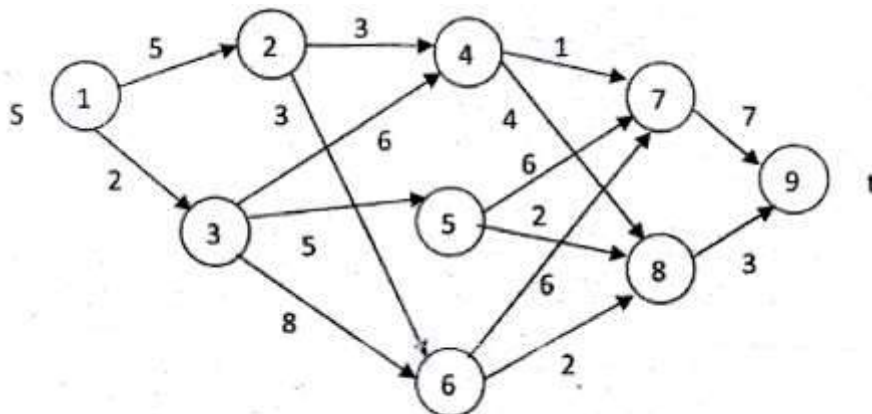


**SECTION – II****Q.4 Attempt any Four.****20**

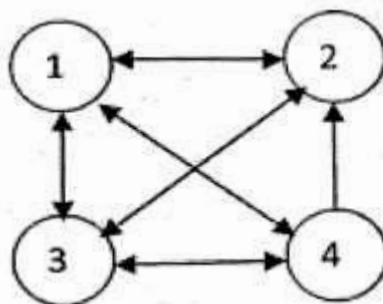
- Write a note on – Reliability design.
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- Draw portion of solution space tree for 4- Queen problem using backtracking.
- Explain Hamilton cycle.
- Define P, NP, NP-hard problem.
- Find all pair shortest path using dynamic programming for following diagram

**Q.5 Attempt any One.****08**

- Find the minimum cost from s to t in multistage graph using backward approach.



- Consider following directed graph and edge lengths are given by matrix. Find optimal tour travelling sales person.



0	10	15	20
5	0	9	10
6	13	0	12
8	8	9	0

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Design and Analysis of Algorithm**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The smallest number of colors needed to color a graph G is called its \_\_\_\_
  - a) Face number
  - b) Chromatic number
  - c) Edges number
  - d) Vertex number
- 2) If a problem Q is known to be NP-hard, then which of the following is true?
  - a) If Q is in NP then Q is NP-complete
  - b) Q is not NP-complete
  - c) Q is not in NP
  - d) Not all problem is NP can be reduce to Q
- 3) A problem is NP-Complete if the problem is \_\_\_\_
  - a) NP-Hard
  - b) P only
  - c) P Hard and in NP
  - d) NP Hard but not in NP
- 4) Which of the following statements are true?
  - 1) The problem of determining whether there exists a cycle in an undirected graph is in P
  - 2) The problem of determining whether there exists a cycle in an undirected graph is in NP
  - 3) If a problem A is NP-complete, there exists a non-deterministic polynomial time algorithm to solve A
  - a) 1, 2 and 3
  - b) 1 and 3
  - c) 2 only
  - d) 3 only
- 5) Time Complexity is \_\_\_\_
  - a) Space required by program
  - b) Amount of machine time necessary for running program
  - c) Time required for programmer to code
  - d) All of above
- 6) Algorithm A is said to be \_\_\_\_ recursive if it call another algorithm which in turn calls A.
  - a) Indirect
  - b) Direct
  - c) Pointed
  - d) Related
- 7) \_\_\_\_ method is used for solving recurrence relation.
  - a) Division
  - b) Substitution
  - c) Replacement
  - d) None of these

- 8) For merging two sorted lists of sizes  $m$  and  $n$  into a sorted list of size  $m + n$ , we require comparison of \_\_\_\_\_.  
a)  $O(m + n)$                                       b)  $O(m)$   
c)  $O(n)$     d)  $O(\log m + \log n)$
- 9) Which of the following sorting algorithms has the lowest worst-case complexity?  
a) Merge sort                                      b) Bubble sort  
c) Quick sort                                        d) Selection sort
- 10) Job sequencing with deadlines is an example of \_\_\_\_\_ greedy method.  
a) subset paradigm                                b) ordering paradigm  
c) both a) and c)                                 d) none of the above
- 11) In an optimal storage on tape problem if  $(\lambda_1, \lambda_2, \lambda_3) = (5, 10, 3)$  then the optimal ordering of program is  
a) 1, 2, 3    b) 3, 1, 2  
c) 2, 3, 1    d) 1, 3, 2
- 12) Which algorithm design technique is the most efficient one for solving the problem of real knapsack?  
a) Enumerating strategy                        b) Divide and conquer  
c) Greedy strategy                                d) Backtracking
- 13) Which one of the following algorithm design techniques is used in finding all pairs of shortest distance in Graph?  
a) Dynamic programming                      b) Backtracking  
c) Greedy method                                d) Divide and conquer
- 14) \_\_\_\_\_ is a generated node which is too expanded further or all of whose children have been generated.  
a) Live node                                        b) E-node  
c) Dead node                                        d) Root Node

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No.

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Day & Date: Thursday, 09-02-2023  
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Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**SECTION – I****Q.2 Solve any four questions.****20**

- Define space and time complexity with suitable example.
- State and prove time complexity of Merge sort.
- Explain Binary Search with suitable example.
- Using Greedy approach find maximum profit earned for the given Knapsack problem.

Profit = (12,10,8,11,14,7,9)

Weight = (4,6,5,7,3,1,6)

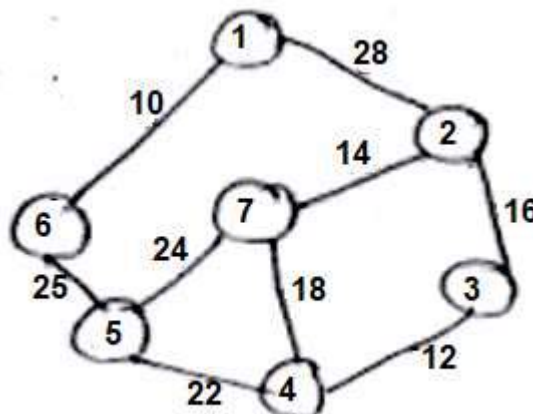
M=18

e)	Symbol	Frequency
	A	70 Million
	B	3 Million
	C	20 Million
	D	37 Million

Find decode tree and code for particular symbol.

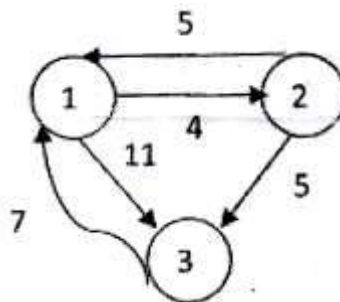
**Q.3 Solve any One.****08**

- Sort following elements using Quick sort (Show each iteration).  
65, 70, 75, 80, 85, 60, 55, 50, 45
- Find the minimum cost spanning tree using Prims and Kruskals algorithm.  
(show each iteration)

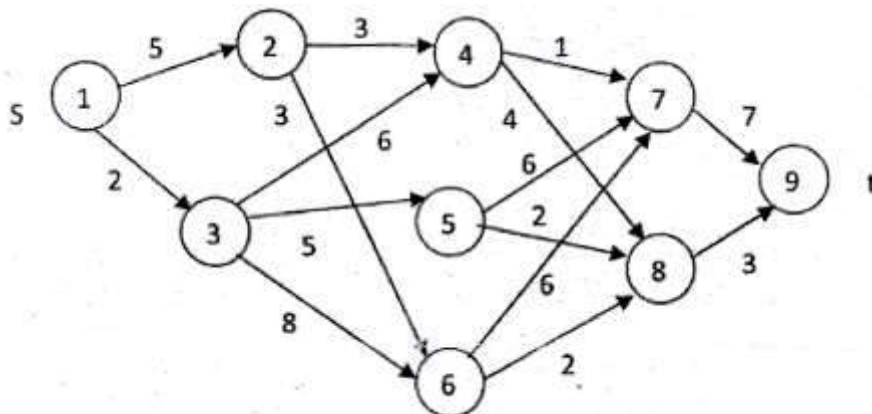


**SECTION – II****Q.4 Attempt any Four.****20**

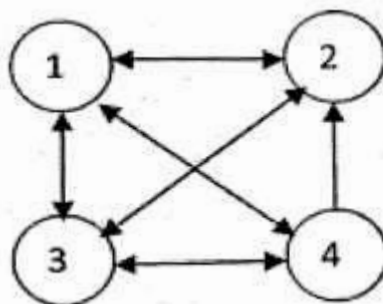
- Write a note on – Reliability design.
- Solve 0/1 Knapsack problem using Dynamic Programming  
 $N = 3$ ,  $m = 6$  profit = {1, 2, 5} and weight = {2, 3, 4}
- Draw portion of solution space tree for 4- Queen problem using backtracking.
- Explain Hamilton cycle.
- Define P, NP, NP-hard problem.
- Find all pair shortest path using dynamic programming for following diagram

**Q.5 Attempt any One.****08**

- Find the minimum cost from s to t in multistage graph using backward approach.



- Consider following directed graph and edge lengths are given by matrix. Find optimal tour travelling sales person.



0	10	15	20
5	0	9	10
6	13	0	12
8	8	9	0

Seat No.	
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Duration: 30 Minutes

Marks: 70

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**14**

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- 14) Which of the following sorting algorithms has the lowest worst-case complexity?
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  - c) Quick sort
  - d) Selection sort

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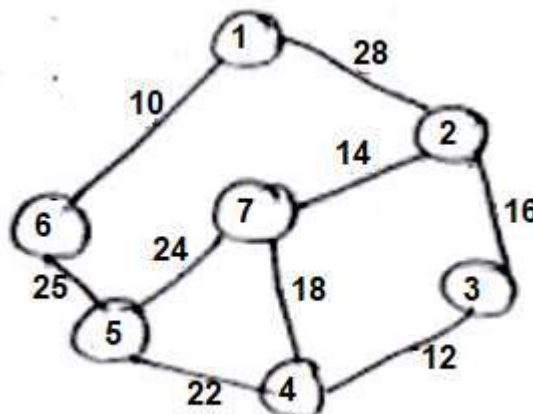
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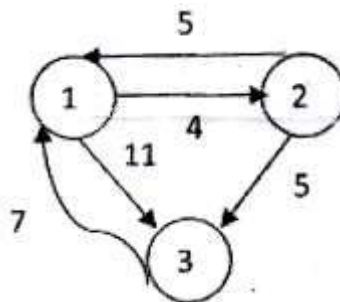


## SECTION – II

20

## Q.4 Attempt any Four.

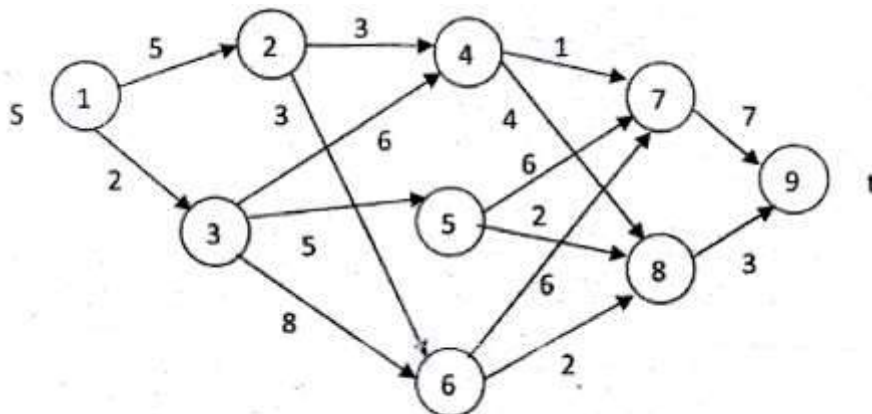
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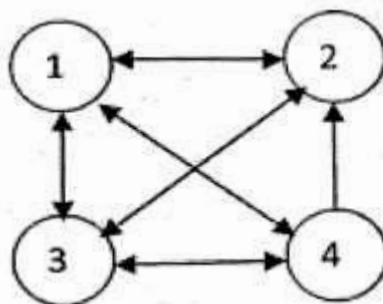
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5	0	9	10
6	13	0	12
8	8	9	0

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
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Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
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- 2) Variable factor means those factors of production \_\_\_\_\_.
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- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
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- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
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- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
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<b>Seat No.</b>	
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<b>Set Q</b>
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- |  |           |
|--|-----------|
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**Set R**

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  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-216**

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850



- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 2) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks
- 6) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 7) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 9) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

<b>Seat No.</b>	
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- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works



Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two)** **20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four)** **20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 2) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 3) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 4) What is culture?
 

a) literature	b) way of life
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- 5) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 6) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 7) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**

**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 2) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 3) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 5) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 6) Which is distinctive nature of family?
  - a) Small family
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  - c) Bilateral unit
  - d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
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- 8) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
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- 9) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 10) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

10

- 1) Anxiety can cause the following moods \_\_\_\_\_.  
a) Irritable                      b) Nervous  
c) Anxious                        d) All of the above
- 2) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
a) Role stagnation                b) Role Isolation  
c) Role erosion                    d) Role ambiguity
- 3) Stress is \_\_\_\_\_ related to performance.  
a) Positively                        b) Negatively  
c) Proportionately                d) None of these
- 4) Which one is not considered as Environmental stressors?  
a) Weather                          b) Traffic  
c) Financial problems             d) Substandard housing
- 5) The following are the characteristics of Positive Stress.  
a) It improves performance      b) It feels exciting  
c) It motivates                      d) All of the above
- 6) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
a) Draw tight                        b) Stimulus  
c) Force                                d) Attitude
- 7) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
a) Medical                            b) Psychological  
c) Behavioral                        d) None of these
- 8) When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later            b) Drink alcohol to relax  
c) Break it down into smaller task   d) Avoid the task
- 9) A good way to prevent stress is \_\_\_\_\_.  
a) Drinking beverages high in caffeine  
b) Sitting ideal doing nothing  
c) Overeating  
d) Taking time out for relaxation

- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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**Set****P**

**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |   |           |
|---|-----------|
| <b>Q.2</b> Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> Define Stress & explain current and historical status of stress. | <b>10</b> |

**Seat  
No.**

Max. Marks: 50

Marks: 10

10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_.
- a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |   |           |
|---|-----------|
| <b>Q.2</b> Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks:10

10

- Page 1 of 12



- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

- Page 5 of 12

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics



**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Max. Marks: 50

### MCQ/Objective Type Questions

Marks:10

10

- 1) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 2) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 4) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 5) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above
- 6) The objectives of professional ethics in engineering are
  - a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

- a) Culture
- c) Society

- b) Value  
d) Moral

- a) Moral  
c) Values

- b) Ethics
- d) Positive and preferred values

<b>Seat No.</b>	
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**Set**

<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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Set

P

**T. Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Compiler Construction**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Multiple choice questions**

**14**

- 1) A compiler for a high-level language that runs on one machine and produce code for different machine is called \_\_\_\_\_.  
 a) Optimizing compiler                      b) One pass compiler  
 c) Cross compiler                              d) Multipass compiler
- 2) Task of the lexical analysis is \_\_\_\_\_.  
 a) To scan the source program and generate the basic elements or tokens of the language  
 b) To support macro call  
 c) To report errors in source program  
 d) All of these
- 3) In operator precedence parsing, precedence relations are defined \_\_\_\_\_.  
 a) For all pair of non-terminals              b) For all pair of terminals  
 c) To delimit the handle                      d) All of these
- 4) Which concept of grammar is used in the compiler?  
 a) Parser    b) Lexical analysis  
 c) Code generation                              d) Code optimization
- 5) Synthesized attribute can be easily simulated by a \_\_\_\_\_.  
 a) LL grammar                                      b) LR grammar  
 c) Ambiguous grammar                        d) Operator grammar
- 6) Which of the following is not a feature of compiler?  
 a) Scan the entire program first and translate into machine code  
 b) To remove syntax errors  
 c) Slow for debugging  
 d) Execution time is more
- 7) A programmer by mistakes writes a program to multiply two numbers instead of dividing them, how can this error be detected?  
 a) Compiler    b) Interpreter  
 c) Compiler or interpreter                      d) None of the mentioned

- 8) Running time of a program depends on \_\_\_\_\_.  
a) Addressing mode                      b) Order of computations  
c) The usage of machine idioms      d) All of the mentioned
- 9) Peep Hole optimization is \_\_\_\_\_.  
a) Loop Optimization                      b) Local Optimization  
c) Constant folding                      d) Data Flow analysis
- 10) The graph that shows basic blocks and their successor relationship is called \_\_\_\_\_.  
a) Dag    b) Flow Graph  
c) Control Graph                          d) Hamilton Graph
- 11) The specific task storage manager performs \_\_\_\_\_.  
a) Allocation/ deal location of programs  
b) Protection of storage area assigned to the program  
c) Allocation/ deal location of programs & protection of storage area assigned to the program  
d) None of the mentioned
- 12) An intermediate code form is \_\_\_\_\_.  
a) Postfix notation                      b) Syntax trees  
c) Three address code                      d) All of these
- 13) Reduction in strength means \_\_\_\_\_.  
a) Replacing run time computation by compile time computation  
b) Removing loop invariant computation  
c) Removing common sub expression  
d) Replacing a costly operation by a relatively cheaper one
- 14) The optimization which avoids test at every iteration is \_\_\_\_\_.  
a) Loop jamming                              b) Loop unrolling  
c) Constant folding                              d) All of these

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**T. Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Compiler Construction**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following questions. 12**

- a) Explain the terms with example:
  - i) Tokens
  - ii) Lexeme
- b) What are compiler construction tools? Explain.
- c) Explain types of derivation with example.
- d) Explain L attributed definition of SDD with example.

**Q.3 Attempt any one of the following questions. 08**

- a) Explain SLR parser in detail with example.
- b) What is input buffering? Explain in detail with double buffer and sentinel concept.

**Q.4 Attempt any one of the following questions. 08**

- a) Explain bottom up evaluation of S- attributed definition with example.
- b) Explain process of compilation with various phases in detail.

**Section – II**

**Q.5 Attempt any three of the following questions. 12**

- a) Explain Activation record with its fields.
- b) Explain the terms with example:
  - i) Triple
  - ii) Quadruple
- c) What is DAG? Explain with example
- d) Explain common sub expression elimination.

**Q.6 Attempt any one of the following questions. 08**

- a) Write an algorithm for partitioning into basic blocks by considering following program code.  

```

prod = 0;

i = 1;
do
{
  prod=prod+a[i]*b[i];
  i=i+1;
}while(i<=10);

```

- b)** Explain translation of switch-case statement in 3 address code.

**Q.7 Attempt any one of the following questions.**

**08**

- a)** Explain storage allocation strategies in detail.
- b)** What is optimization? Explain peephole optimization techniques in detail.

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**T. Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Compiler Construction**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Multiple choice questions**

**14**

- 1) Running time of a program depends on \_\_\_\_\_.  
 a) Addressing mode                      b) Order of computations  
 c) The usage of machine idioms      d) All of the mentioned
- 2) Peep Hole optimization is \_\_\_\_\_.  
 a) Loop Optimization                      b) Local Optimization  
 c) Constant folding                      d) Data Flow analysis
- 3) The graph that shows basic blocks and their successor relationship is called \_\_\_\_\_.  
 a) Dag    b) Flow Graph  
 c) Control Graph                          d) Hamilton Graph
- 4) The specific task storage manager performs \_\_\_\_\_.  
 a) Allocation/ deal location of programs  
 b) Protection of storage area assigned to the program  
 c) Allocation/ deal location of programs & protection of storage area assigned to the program  
 d) None of the mentioned
- 5) An intermediate code form is \_\_\_\_\_.  
 a) Postfix notation                      b) Syntax trees  
 c) Three address code                      d) All of these
- 6) Reduction in strength means \_\_\_\_\_.  
 a) Replacing run time computation by compile time computation  
 b) Removing loop invariant computation  
 c) Removing common sub expression  
 d) Replacing a costly operation by a relatively cheaper one
- 7) The optimization which avoids test at every iteration is \_\_\_\_\_.  
 a) Loop jamming                      b) Loop unrolling  
 c) Constant folding                      d) All of these
- 8) A compiler for a high-level language that runs on one machine and produce code for different machine is called \_\_\_\_\_.  
 a) Optimizing compiler                      b) One pass compiler  
 c) Cross compiler                      d) Multipass compiler



- 9) Task of the lexical analysis is \_\_\_\_\_.  
a) To scan the source program and generate the basic elements or tokens of the language  
b) To support macro call  
c) To report errors in source program  
d) All of these
- 10) In operator precedence parsing, precedence relations are defined \_\_\_\_\_.  
a) For all pair of non-terminals      b) For all pair of terminals  
c) To delimit the handle              d) All of these
- 11) Which concept of grammar is used in the compiler?  
a) Parser                                      b) Lexical analysis  
c) Code generation                      d) Code optimization
- 12) Synthesized attribute can be easily simulated by a \_\_\_\_\_.  
a) LL grammar                              b) LR grammar  
c) Ambiguous grammar                  d) Operator grammar
- 13) Which of the following is not a feature of compiler?  
a) Scan the entire program first and translate into machine code  
b) To remove syntax errors  
c) Slow for debugging  
d) Execution time is more
- 14) A programmer by mistakes writes a program to multiply two numbers instead of dividing them, how can this error be detected?  
a) Compiler                                      b) Interpreter  
c) Compiler or interpreter                  d) None of the mentioned

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**T. Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Compiler Construction**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following questions. 12**

- a) Explain the terms with example:
  - i) Tokens
  - ii) Lexeme
- b) What are compiler construction tools? Explain.
- c) Explain types of derivation with example.
- d) Explain L attributed definition of SDD with example.

**Q.3 Attempt any one of the following questions. 08**

- a) Explain SLR parser in detail with example.
- b) What is input buffering? Explain in detail with double buffer and sentinel concept.

**Q.4 Attempt any one of the following questions. 08**

- a) Explain bottom up evaluation of S- attributed definition with example.
- b) Explain process of compilation with various phases in detail.

**Section – II**

**Q.5 Attempt any three of the following questions. 12**

- a) Explain Activation record with its fields.
- b) Explain the terms with example:
  - i) Triple
  - ii) Quadruple
- c) What is DAG? Explain with example
- d) Explain common sub expression elimination.

**Q.6 Attempt any one of the following questions. 08**

- a) Write an algorithm for partitioning into basic blocks by considering following program code.  

```

prod = 0;

i = 1;
do
{
  prod=prod+a[i]*b[i];
  i=i+1;
}while(i<=10);

```

- b)** Explain translation of switch-case statement in 3 address code.

**Q.7 Attempt any one of the following questions.**

**08**

- a)** Explain storage allocation strategies in detail.
- b)** What is optimization? Explain peephole optimization techniques in detail.

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**T. Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Compiler Construction**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Multiple choice questions**

**14**

- 1) The specific task storage manager performs \_\_\_\_\_.  
 a) Allocation/ deal location of programs  
 b) Protection of storage area assigned to the program  
 c) Allocation/ deal location of programs & protection of storage area assigned to the program  
 d) None of the mentioned
- 2) An intermediate code form is \_\_\_\_\_.  
 a) Postfix notation  
 b) Syntax trees  
 c) Three address code  
 d) All of these
- 3) Reduction in strength means \_\_\_\_\_.  
 a) Replacing run time computation by compile time computation  
 b) Removing loop invariant computation  
 c) Removing common sub expression  
 d) Replacing a costly operation by a relatively cheaper one
- 4) The optimization which avoids test at every iteration is \_\_\_\_\_.  
 a) Loop jamming  
 b) Loop unrolling  
 c) Constant folding  
 d) All of these
- 5) A compiler for a high-level language that runs on one machine and produce code for different machine is called \_\_\_\_\_.  
 a) Optimizing compiler  
 b) One pass compiler  
 c) Cross compiler  
 d) Multipass compiler
- 6) Task of the lexical analysis is \_\_\_\_\_.  
 a) To scan the source program and generate the basic elements or tokens of the language  
 b) To support macro call  
 c) To report errors in source program  
 d) All of these
- 7) In operator precedence parsing, precedence relations are defined \_\_\_\_\_.  
 a) For all pair of non-terminals  
 b) For all pair of terminals  
 c) To delimit the handle  
 d) All of these



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**T. Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Compiler Construction**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following questions. 12**

- a) Explain the terms with example:
  - i) Tokens
  - ii) Lexeme
- b) What are compiler construction tools? Explain.
- c) Explain types of derivation with example.
- d) Explain L attributed definition of SDD with example.

**Q.3 Attempt any one of the following questions. 08**

- a) Explain SLR parser in detail with example.
- b) What is input buffering? Explain in detail with double buffer and sentinel concept.

**Q.4 Attempt any one of the following questions. 08**

- a) Explain bottom up evaluation of S- attributed definition with example.
- b) Explain process of compilation with various phases in detail.

**Section – II**

**Q.5 Attempt any three of the following questions. 12**

- a) Explain Activation record with its fields.
- b) Explain the terms with example:
  - i) Triple
  - ii) Quadruple
- c) What is DAG? Explain with example
- d) Explain common sub expression elimination.

**Q.6 Attempt any one of the following questions. 08**

- a) Write an algorithm for partitioning into basic blocks by considering following program code.  

```

prod = 0;

i = 1;
do
{
  prod=prod+a[i]*b[i];
  i=i+1;
}while(i<=10);

```

- b)** Explain translation of switch-case statement in 3 address code.

**Q.7 Attempt any one of the following questions.**

**08**

- a)** Explain storage allocation strategies in detail.  
**b)** What is optimization? Explain peephole optimization techniques in detail.

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**T. Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Compiler Construction**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Multiple choice questions**

**14**

- 1) Which of the following is not a feature of compiler?
  - a) Scan the entire program first and translate into machine code
  - b) To remove syntax errors
  - c) Slow for debugging
  - d) Execution time is more
- 2) A programmer by mistakes writes a program to multiply two numbers instead of dividing them, how can this error be detected?
  - a) Compiler
  - b) Interpreter
  - c) Compiler or interpreter
  - d) None of the mentioned
- 3) Running time of a program depends on \_\_\_\_\_.
  - a) Addressing mode
  - b) Order of computations
  - c) The usage of machine idioms
  - d) All of the mentioned
- 4) Peep Hole optimization is \_\_\_\_\_.
  - a) Loop Optimization
  - b) Local Optimization
  - c) Constant folding
  - d) Data Flow analysis
- 5) The graph that shows basic blocks and their successor relationship is called \_\_\_\_\_.
  - a) Dag
  - b) Flow Graph
  - c) Control Graph
  - d) Hamilton Graph
- 6) The specific task storage manager performs \_\_\_\_\_.
  - a) Allocation/ deal location of programs
  - b) Protection of storage area assigned to the program
  - c) Allocation/ deal location of programs & protection of storage area assigned to the program
  - d) None of the mentioned
- 7) An intermediate code form is \_\_\_\_\_.
  - a) Postfix notation
  - b) Syntax trees
  - c) Three address code
  - d) All of these



- 8) Reduction in strength means \_\_\_\_\_.  
a) Replacing run time computation by compile time computation  
b) Removing loop invariant computation  
c) Removing common sub expression  
d) Replacing a costly operation by a relatively cheaper one
- 9) The optimization which avoids test at every iteration is \_\_\_\_\_.  
a) Loop jamming  
b) Loop unrolling  
c) Constant folding  
d) All of these
- 10) A compiler for a high-level language that runs on one machine and produce code for different machine is called \_\_\_\_\_.  
a) Optimizing compiler  
b) One pass compiler  
c) Cross compiler  
d) Multipass compiler
- 11) Task of the lexical analysis is \_\_\_\_\_.  
a) To scan the source program and generate the basic elements or tokens of the language  
b) To support macro call  
c) To report errors in source program  
d) All of these
- 12) In operator precedence parsing, precedence relations are defined \_\_\_\_\_.  
a) For all pair of non-terminals  
b) For all pair of terminals  
c) To delimit the handle  
d) All of these
- 13) Which concept of grammar is used in the compiler?  
a) Parser  
b) Lexical analysis  
c) Code generation  
d) Code optimization
- 14) Synthesized attribute can be easily simulated by a \_\_\_\_\_.  
a) LL grammar  
b) LR grammar  
c) Ambiguous grammar  
d) Operator grammar

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**T. Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE AND ENGINEERING**  
**Compiler Construction**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following questions. 12**

- Explain the terms with example:
  - Tokens
  - Lexeme
- What are compiler construction tools? Explain.
- Explain types of derivation with example.
- Explain L attributed definition of SDD with example.

**Q.3 Attempt any one of the following questions. 08**

- Explain SLR parser in detail with example.
- What is input buffering? Explain in detail with double buffer and sentinel concept.

**Q.4 Attempt any one of the following questions. 08**

- Explain bottom up evaluation of S- attributed definition with example.
- Explain process of compilation with various phases in detail.

**Section – II**

**Q.5 Attempt any three of the following questions. 12**

- Explain Activation record with its fields.
- Explain the terms with example:
  - Triple
  - Quadruple
- What is DAG? Explain with example
- Explain common sub expression elimination.

**Q.6 Attempt any one of the following questions. 08**

- Write an algorithm for partitioning into basic blocks by considering following program code.  

```

prod = 0;

i = 1;
do
{
  prod=prod+a[i]*b[i];
  i=i+1;
}while(i<=10);

```

- b)** Explain translation of switch-case statement in 3 address code.

**Q.7 Attempt any one of the following questions.**

**08**

- a)** Explain storage allocation strategies in detail.  
**b)** What is optimization? Explain peephole optimization techniques in detail.

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Unix Operating System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Kernel maintains the \_\_\_\_\_ of buffers that preserves the least recently used order.
 

a) First list	b) Queue
c) Tree	d) Stack
- 2) \_\_\_\_\_ algorithm is used for conversion of Byte offset to Block number in file system.
 

a) map	b) bmap
c) bread	d) none of these
- 3) \_\_\_\_\_ is used to write error messages to standard error file.
 

a) <	b) >
c) 2>	d) err
- 4) \_\_\_\_\_ algorithm is used for validity fault handler.
 

a) fault	b) vfault
c) bfault	d) mfault
- 5) \_\_\_\_\_ data structure is used for allocation of swap space.
 

a) malloc	b) map
c) region table	d) page table
- 6) The syntax of the system call chown is \_\_\_\_\_.
 

a) chown(pathname,owner)
b) chown(filename,owner)
c) chown(pathname,owner,group)
d) chown(filename,owner,group)
- 7) The state \_\_\_\_\_ is logically the same as ready to run in memory.
 

a) zombie	b) preempted
c) ready to run	d) sleeping
- 8) A \_\_\_\_\_ file type field indicates that disk inode is assigned.
 

a) zero	b) negative value
c) non-zero	d) none of these
- 9) \_\_\_\_\_ process is commonly called init because it is responsible for initializing of new process.
 

a) process 0	b) process1
c) Swapper	d) Superuser

- 10) A process can synchronize its execution with the termination of a child by executing \_\_\_\_\_ system call.
- |         |         |
|---------|---------|
| a) wait | b) exec |
| c) fork | d) exit |
- 11) The system call \_\_\_\_\_ creates special files in the system, including named pipes, device files and directories.
- |          |         |
|----------|---------|
| a) mknod | b) mkfs |
| c) creat | d) pipe |
- 12) Moving between kernel and user mode is called as \_\_\_\_\_.
- |                   |                   |
|-------------------|-------------------|
| a) change in mode | b) context switch |
| c) kernel running | d) none of above  |
- 13) \_\_\_\_\_ has access rights to all files in the system.
- |                 |                |
|-----------------|----------------|
| a) User process | b) User        |
| c) Superuser    | d) Group owner |
- 14) Algorithm used for handling signal is \_\_\_\_\_.
- |             |              |
|-------------|--------------|
| a) psig     | b) issig     |
| c) sigcatch | d) sighandle |

Seat No.	
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Set	P
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Unix Operating System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What are different Processor Execution Levels (PEL). What is the role of PEL in operating system?
- Consider that, block number 2 is the start block of the inode list and there are 8 inode per block. Calculate the block number for inode number 8 and calculate byte offset for the same. (Size of disk inode = 64 bytes)
- Describe different advantages and disadvantages of Buffer Cache.
- Write a short note on Pipe System call.

**Q.3 Solve any two of the following questions. 16**

- Explain architecture of Unix operating system with the help of block diagram of system kernel in detail.
- Describe in detail the scenario of *getblk* algorithm used to allocate buffer for a disk block.
- Explain how kernel allocates an inode to newly created file using *ialloc* algorithm and how it releases the inode using *ifree* algorithm.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- What is signal? Explain algorithm used for recognizing it.
- Describe system *boot* and *init* process in detail.
- Explain system calls used for time.
- Explain fork System call in detail.

**Q.5 Solve any two of the following questions. 16**

- What is Context of process? Explain components of context of process in detail.
- What are different data structures used by a system which supports demand paging? Explain in detail.
- Describe Process state transition diagram in detail.

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**Duration: 30 Minutes**

**Q.1 Choose the correct alternatives from the options.**

- 1) A \_\_\_\_\_ file type field indicates that disk inode is assigned.

a) zero	b) negative value
c) non-zero	d) none of these
- 2) \_\_\_\_\_ process is commonly called init because it is responsible for initializing of new process.

a) process 0	b) process1
c) Swapper	d) Superuser
- 3) A process can synchronize its execution with the termination of a child by executing \_\_\_\_\_ system call.

a) wait	b) exec
c) fork	d) exit
- 4) The system call \_\_\_\_\_ creates special files in the system, including named pipes, device files and directories.

a) mknod	b) mkfs
c) creat	d) pipe
- 5) Moving between kernel and user mode is called as \_\_\_\_\_.

a) change in mode	b) context switch
c) kernel running	d) none of above
- 6) \_\_\_\_\_ has access rights to all files in the system.

a) User process	b) User
c) Superuser	d) Group owner
- 7) Algorithm used for handling signal is \_\_\_\_\_.

a) psig	b) issig
c) sigcatch	d) sighandle
- 8) Kernel maintains the \_\_\_\_\_ of buffers that preserves the least recently used order.

a) First list	b) Queue
c) Tree	d) Stack
- 9) \_\_\_\_\_ algorithm is used for conversion of Byte offset to Block number in file system.

a) map	b) bmap
c) bread	d) none of these





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Set Q
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Unix Operating System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What are different Processor Execution Levels (PEL). What is the role of PEL in operating system?
- Consider that, block number 2 is the start block of the inode list and there are 8 inode per block. Calculate the block number for inode number 8 and calculate byte offset for the same. (Size of disk inode = 64 bytes)
- Describe different advantages and disadvantages of Buffer Cache.
- Write a short note on Pipe System call.

**Q.3 Solve any two of the following questions. 16**

- Explain architecture of Unix operating system with the help of block diagram of system kernel in detail.
- Describe in detail the scenario of *getblk* algorithm used to allocate buffer for a disk block.
- Explain how kernel allocates an inode to newly created file using *ialloc* algorithm and how it releases the inode using *ifree* algorithm.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- What is signal? Explain algorithm used for recognizing it.
- Describe system *boot* and *init* process in detail.
- Explain system calls used for time.
- Explain fork System call in detail.

**Q.5 Solve any two of the following questions. 16**

- What is Context of process? Explain components of context of process in detail.
- What are different data structures used by a system which supports demand paging? Explain in detail.
- Describe Process state transition diagram in detail.

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Unix Operating System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The system call \_\_\_\_\_ creates special files in the system, including named pipes, device files and directories.
 

a) mknod	b) mkfs
c) creat	d) pipe
- 2) Moving between kernel and user mode is called as \_\_\_\_\_.
 

a) change in mode	b) context switch
c) kernel running	d) none of above
- 3) \_\_\_\_\_ has access rights to all files in the system.
 

a) User process	b) User
c) Superuser	d) Group owner
- 4) Algorithm used for handling signal is \_\_\_\_\_.
 

a) psig	b) issig
c) sigcatch	d) sighandle
- 5) Kernel maintains the \_\_\_\_\_ of buffers that preserves the least recently used order.
 

a) First list	b) Queue
c) Tree	d) Stack
- 6) \_\_\_\_\_ algorithm is used for conversion of Byte offset to Block number in file system.
 

a) map	b) bmap
c) bread	d) none of these
- 7) \_\_\_\_\_ is used to write error messages to standard error file.
 

a) <	b) >
c) 2>	d) err
- 8) \_\_\_\_\_ algorithm is used for validity fault handler.
 

a) fault	b) vfault
c) bfault	d) mfault
- 9) \_\_\_\_\_ data structure is used for allocation of swap space.
 

a) malloc	b) map
c) region table	d) page table

- 10) The syntax of the system call `chown` is \_\_\_\_\_.  
a) `chown(pathname,owner)`  
b) `chown(filename,owner)`  
c) `chown(pathname,owner,group)`  
d) `chown(filename,owner,group)`
- 11) The state \_\_\_\_\_ is logically the same as ready to run in memory.  
a) zombie  
b) preempted  
c) ready to run  
d) sleeping
- 12) A \_\_\_\_\_ file type field indicates that disk inode is assigned.  
a) zero  
b) negative value  
c) non-zero  
d) none of these
- 13) \_\_\_\_\_ process is commonly called `init` because it is responsible for initializing of new process.  
a) process 0  
b) process1  
c) Swapper  
d) Superuser
- 14) A process can synchronize its execution with the termination of a child by executing \_\_\_\_\_ system call.  
a) `wait`  
b) `exec`  
c) `fork`  
d) `exit`

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Unix Operating System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What are different Processor Execution Levels (PEL). What is the role of PEL in operating system?
- Consider that, block number 2 is the start block of the inode list and there are 8 inode per block. Calculate the block number for inode number 8 and calculate byte offset for the same. (Size of disk inode = 64 bytes)
- Describe different advantages and disadvantages of Buffer Cache.
- Write a short note on Pipe System call.

**Q.3 Solve any two of the following questions. 16**

- Explain architecture of Unix operating system with the help of block diagram of system kernel in detail.
- Describe in detail the scenario of *getblk* algorithm used to allocate buffer for a disk block.
- Explain how kernel allocates an inode to newly created file using *ialloc* algorithm and how it releases the inode using *ifree* algorithm.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- What is signal? Explain algorithm used for recognizing it.
- Describe system *boot* and *init* process in detail.
- Explain system calls used for time.
- Explain fork System call in detail.

**Q.5 Solve any two of the following questions. 16**

- What is Context of process? Explain components of context of process in detail.
- What are different data structures used by a system which supports demand paging? Explain in detail.
- Describe Process state transition diagram in detail.

Seat No.	
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Set	S
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Unix Operating System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The syntax of the system call chown is \_\_\_\_\_.  
 a) chown(pathname,owner)  
 b) chown(filename,owner)  
 c) chown(pathname,owner,group)  
 d) chown(filename,owner,group)
- 2) The state \_\_\_\_\_ is logically the same as ready to run in memory.  
 a) zombie  
 b) preempted  
 c) ready to run  
 d) sleeping
- 3) A \_\_\_\_\_ file type field indicates that disk inode is assigned.  
 a) zero  
 b) negative value  
 c) non-zero  
 d) none of these
- 4) \_\_\_\_\_ process is commonly called init because it is responsible for initializing of new process.  
 a) process 0  
 b) process1  
 c) Swapper  
 d) Superuser
- 5) A process can synchronize its execution with the termination of a child by executing \_\_\_\_\_ system call.  
 a) wait  
 b) exec  
 c) fork  
 d) exit
- 6) The system call \_\_\_\_\_ creates special files in the system, including named pipes, device files and directories.  
 a) mknod  
 b) mkfs  
 c) creat  
 d) pipe
- 7) Moving between kernel and user mode is called as \_\_\_\_\_.  
 a) change in mode  
 b) context switch  
 c) kernel running  
 d) none of above
- 8) \_\_\_\_\_ has access rights to all files in the system.  
 a) User process  
 b) User  
 c) Superuser  
 d) Group owner
- 9) Algorithm used for handling signal is \_\_\_\_\_.  
 a) psig  
 b) issig  
 c) sigcatch  
 d) sighandle

- 10) Kernel maintains the \_\_\_\_\_ of buffers that preserves the least recently used order.
- |               |          |
|---------------|----------|
| a) First list | b) Queue |
| c) Tree       | d) Stack |
- 11) \_\_\_\_\_ algorithm is used for conversion of Byte offset to Block number in file system.
- |          |                  |
|----------|------------------|
| a) map   | b) bmap          |
| c) bread | d) none of these |
- 12) \_\_\_\_\_ is used to write error messages to standard error file.
- |       |        |
|-------|--------|
| a) <  | b) >   |
| c) 2> | d) err |
- 13) \_\_\_\_\_ algorithm is used for validity fault handler.
- |           |           |
|-----------|-----------|
| a) fault  | b) vfault |
| c) bfault | d) mfault |
- 14) \_\_\_\_\_ data structure is used for allocation of swap space.
- |                 |               |
|-----------------|---------------|
| a) malloc       | b) map        |
| c) region table | d) page table |

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Unix Operating System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What are different Processor Execution Levels (PEL). What is the role of PEL in operating system?
- Consider that, block number 2 is the start block of the inode list and there are 8 inode per block. Calculate the block number for inode number 8 and calculate byte offset for the same. (Size of disk inode = 64 bytes)
- Describe different advantages and disadvantages of Buffer Cache.
- Write a short note on Pipe System call.

**Q.3 Solve any two of the following questions. 16**

- Explain architecture of Unix operating system with the help of block diagram of system kernel in detail.
- Describe in detail the scenario of *getblk* algorithm used to allocate buffer for a disk block.
- Explain how kernel allocates an inode to newly created file using *ialloc* algorithm and how it releases the inode using *ifree* algorithm.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- What is signal? Explain algorithm used for recognizing it.
- Describe system *boot* and *init* process in detail.
- Explain system calls used for time.
- Explain fork System call in detail.

**Q.5 Solve any two of the following questions. 16**

- What is Context of process? Explain components of context of process in detail.
- What are different data structures used by a system which supports demand paging? Explain in detail.
- Describe Process state transition diagram in detail.

Seat No.	
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Set	P
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.  
 2) Don't forget to mention the Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.  
 4) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) SIMD represents an organization that \_\_\_\_\_.  
 a) refers to a computer system capable of processing several programs at the same time.  
 b) represents organization of single computer containing a control unit, processor unit and a memory unit.  
 c) includes many processing units under the supervision of a common control unit.  
 d) none of above
- 2) Floating point representation is used to store \_\_\_\_\_.  
 a) Boolean values  
 b) whole numbers  
 c) real integers  
 d) integer
- 3) In computers, subtraction is generally carried out by \_\_\_\_\_.  
 a) 9's complement  
 b) 10's complement  
 c) 1's complement  
 d) 2's complement
- 4) What characteristic of RAM memory makes it not suitable for permanent storage?  
 a) too slow  
 b) unreliable  
 c) it is volatile  
 d) too bulky
- 5) Computers use addressing mode techniques for \_\_\_\_\_.  
 a) giving programming versatility to the user by providing facilities as pointers to memory counters for loop control  
 b) to reduce no. of bits in the field of instruction  
 c) specifying rules for modifying or interpreting address field of the instruction  
 d) all the above
- 6) The circuit used to store one bit of data is known as \_\_\_\_\_.  
 a) Register  
 b) Encoder  
 c) Decoder  
 d) Flip Flop





<b>Seat No.</b>	
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**Set****P****T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022****COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Answer all the questions Section – I & Section - II.

1) Figures to the right indicates full marks

2) Assume suitable data wherever needed and mention it clearly.

**Section – I****Q.2 Attempt any three****12**

- a) Define Bus and explain system bus.
- b) Differentiate between RISC & CISC.
- c) Differentiate between SRAM & DRAM.
- d) Explain floating point numbers with example.
- e) Explain cache memory with dig.

**Q.3 Attempt any two****16**

- a) Explain memory Hierarchy with different levels of memory.
- b) Explain booths multiplication algorithm, with example.
- c) Explain generations of computer.

**Section – II****Q.4 Attempt any three****12**

- a) Explain pipelining with example.
- b) Differentiate between Memory mapped I/O & Isolated I/O.
- c) Differentiate between loosely coupled & tightly coupled multiprocessor.
- d) Explain direct memory access with dig.
- e) Explain shared memory.

**Q.5 Attempt any two****16**

- a) Describe asynchronous and synchronous model of pipelining.
- b) Explain Symmetric multiprocessor arch.
- c) Explain bus arbitration in DMA.

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.
- 2) Don't forget to mention the Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Assume suitable data wherever needed and mention it clearly.
- 4) Figures to the right indicate full marks.

## Marks: 14

- The addressing mode used in an instruction of the form ADD X Y, is \_\_\_\_\_.
  - Absolute
  - indirect
  - index
  - none of these
- Interrupts which are initiated by an instruction are \_\_\_\_\_.
  - internal
  - external
  - hardware
  - software
- Which memory unit has lowest access time?
  - Cache
  - Registers
  - Magnetic Disk
  - Main Memory
- The DMA differs from the interrupt mode by \_\_\_\_\_.
  - The involvement of the processor for the operation
  - The method accessing the I/O devices
  - The amount of data transfer possible
  - None of the mentioned
- The DMA transfers are performed by a control circuit called as \_\_\_\_\_.
  - Device interface
  - DMA controller
  - Data controller
  - Overlooked
- The pipelining process is also called as \_\_\_\_\_.
  - Superscalar operation
  - Assembly line operation
  - Von Neumann cycle
  - None of the mentioned
- Each stage in pipelining should be completed within \_\_\_\_\_ cycle.
  - 1
  - 2
  - 3
  - 4

- 8) SIMD represents an organization that \_\_\_\_\_.  
a) refers to a computer system capable of processing several programs at the same time.  
b) represents organization of single computer containing a control unit, processor unit and a memory unit.  
c) includes many processing units under the supervision of a common control unit.  
d) none of above
- 9) Floating point representation is used to store \_\_\_\_\_.  
a) Boolean values  
b) whole numbers  
c) real integers  
d) integer
- 10) In computers, subtraction is generally carried out by \_\_\_\_\_.  
a) 9's complement  
b) 10's complement  
c) 1's complement  
d) 2's complement
- 11) What characteristic of RAM memory makes it not suitable for permanent storage?  
a) too slow  
b) unreliable  
c) it is volatile  
d) too bulky
- 12) Computers use addressing mode techniques for \_\_\_\_\_.  
a) giving programming versatility to the user by providing facilities as pointers to memory counters for loop control  
b) to reduce no. of bits in the field of instruction  
c) specifying rules for modifying or interpreting address field of the instruction  
d) all the above
- 13) The circuit used to store one bit of data is known as \_\_\_\_\_.  
a) Register  
b) Encoder  
c) Decoder  
d) Flip Flop
- 14) (2FAOC) 16 is equivalent to \_\_\_\_\_.  
a) (195 084) 10  
b) (001011111010 0000 1100) 2  
c) Both (a) and (b)  
d) None of these

<b>Seat No.</b>	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Answer all the questions Section – I & Section - II.

1) Figures to the right indicates full marks

2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any three** **12**

- a) Define Bus and explain system bus.
- b) Differentiate between RISC & CISC.
- c) Differentiate between SRAM & DRAM.
- d) Explain floating point numbers with example.
- e) Explain cache memory with dig.

**Q.3 Attempt any two** **16**

- a) Explain memory Hierarchy with different levels of memory.
- b) Explain booths multiplication algorithm, with example.
- c) Explain generations of computer.

**Section – II**

**Q.4 Attempt any three** **12**

- a) Explain pipelining with example.
- b) Differentiate between Memory mapped I/O & Isolated I/O.
- c) Differentiate between loosely coupled & tightly coupled multiprocessor.
- d) Explain direct memory access with dig.
- e) Explain shared memory.

**Q.5 Attempt any two** **16**

- a) Describe asynchronous and synchronous model of pipelining.
- b) Explain Symmetric multiprocessor arch.
- c) Explain bus arbitration in DMA.

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.
- 2) Don't forget to mention the Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Assume suitable data wherever needed and mention it clearly.
- 4) Figures to the right indicate full marks.

Marks: 14

14

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Set	R
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Answer all the questions Section – I & Section - II.

1) Figures to the right indicates full marks

2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any three** **12**

- a) Define Bus and explain system bus.
- b) Differentiate between RISC & CISC.
- c) Differentiate between SRAM & DRAM.
- d) Explain floating point numbers with example.
- e) Explain cache memory with dig.

**Q.3 Attempt any two** **16**

- a) Explain memory Hierarchy with different levels of memory.
- b) Explain booths multiplication algorithm, with example.
- c) Explain generations of computer.

**Section – II**

**Q.4 Attempt any three** **12**

- a) Explain pipelining with example.
- b) Differentiate between Memory mapped I/O & Isolated I/O.
- c) Differentiate between loosely coupled & tightly coupled multiprocessor.
- d) Explain direct memory access with dig.
- e) Explain shared memory.

**Q.5 Attempt any two** **16**

- a) Describe asynchronous and synchronous model of pipelining.
- b) Explain Symmetric multiprocessor arch.
- c) Explain bus arbitration in DMA.



<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.
- 2) Don't forget to mention the Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Assume suitable data wherever needed and mention it clearly.
- 4) Figures to the right indicate full marks.

Duration: 30 Minutes

Marks: 14

## 14

- 1) The circuit used to store one bit of data is known as \_\_\_\_\_.  
a) Register                                      b) Encoder  
c) Decoder                                        d) Flip Flop
- 2) (2FAOC) 16 is equivalent to \_\_\_\_\_.  
a) (195 084) 10                                  b) (001011111010 0000 1100) 2  
c) Both (a) and (b)                              d) None of these
- 3) The addressing mode used in an instruction of the form ADD X Y, is \_\_\_\_\_.  
a) Absolute                                        b) indirect  
c) index     d) none of these
- 4) Interrupts which are initiated by an instruction are \_\_\_\_\_.  
a) internal    b) external  
c) hardware                                        d) software
- 5) Which memory unit has lowest access time?  
a) Cache    b) Registers  
c) Magnetic Disk                                  d) Main Memory
- 6) The DMA differs from the interrupt mode by \_\_\_\_\_.  
a) The involvement of the processor for the operation  
b) The method accessing the I/O devices  
c) The amount of data transfer possible  
d) None of the mentioned
- 7) The DMA transfers are performed by a control circuit called as \_\_\_\_\_.  
a) Device interface                                b) DMA controller  
c) Data controller                                  d) Overlooked
- 8) The pipelining process is also called as \_\_\_\_\_.  
a) Superscalar operation                        b) Assembly line operation  
c) Von Neumann cycle                           d) None of the mentioned

- 9) Each stage in pipelining should be completed within \_\_\_\_\_ cycle.
- a) 1
  - b) 2
  - c) 3
  - d) 4
- 10) SIMD represents an organization that \_\_\_\_\_.
- a) refers to a computer system capable of processing several programs at the same time.
  - b) represents organization of single computer containing a control unit, processor unit and a memory unit.
  - c) includes many processing units under the supervision of a common control unit.
  - d) none of above
- 11) Floating point representation is used to store \_\_\_\_\_.
- a) Boolean values
  - b) whole numbers
  - c) real integers
  - d) integer
- 12) In computers, subtraction is generally carried out by \_\_\_\_\_.
- a) 9's complement
  - b) 10's complement
  - c) 1's complement
  - d) 2's complement
- 13) What characteristic of RAM memory makes it not suitable for permanent storage?
- a) too slow
  - b) unreliable
  - c) it is volatile
  - d) too bulky
- 14) Computers use addressing mode techniques for \_\_\_\_\_.
- a) giving programming versatility to the user by providing facilities as pointers to memory counters for loop control
  - b) to reduce no. of bits in the field of instruction
  - c) specifying rules for modifying or interpreting address field of the instruction
  - d) all the above

<b>Seat No.</b>	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Answer all the questions Section – I & Section - II.

1) Figures to the right indicates full marks

2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any three** **12**

- a) Define Bus and explain system bus.
- b) Differentiate between RISC & CISC.
- c) Differentiate between SRAM & DRAM.
- d) Explain floating point numbers with example.
- e) Explain cache memory with dig.

**Q.3 Attempt any two** **16**

- a) Explain memory Hierarchy with different levels of memory.
- b) Explain booths multiplication algorithm, with example.
- c) Explain generations of computer.

**Section – II**

**Q.4 Attempt any three** **12**

- a) Explain pipelining with example.
- b) Differentiate between Memory mapped I/O & Isolated I/O.
- c) Differentiate between loosely coupled & tightly coupled multiprocessor.
- d) Explain direct memory access with dig.
- e) Explain shared memory.

**Q.5 Attempt any two** **16**

- a) Describe asynchronous and synchronous model of pipelining.
- b) Explain Symmetric multiprocessor arch.
- c) Explain bus arbitration in DMA.

Seat No.	
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Set 

P
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Artificial Intelligence is about \_\_\_\_\_.  
 a) Playing a game on Computer  
 b) Making a machine Intelligent  
 c) Programming on Machine with your Own Intelligence  
 d) Putting your intelligence in Machine
- 2) Select the most appropriate situation for that a blind search can be used.  
 a) Real-life situation  
 b) Small Search Space  
 c) Complex game  
 d) All of the above
- 3) Among the given options, which search algorithm requires less memory?  
 a) Optimal Search  
 b) Depth-firstsearch  
 c) Breadth-First Search  
 d) Linear Search
- 4) Which of the following is the branch of Artificial Intelligence?  
 a) Machine Learning  
 b) Cyber forensics  
 c) Full-Stack Developer  
 d) Network Design
- 5) Which of the following is a component of Artificial Intelligence?  
 a) Learning  
 b) Training  
 c) Designing cost  
 d) Puzzling
- 6) What is the function of an Artificial Intelligence "Agent"?  
 a) Mapping of goal sequence to an action  
 b) Work without the direct interference of the people  
 c) Mapping of precept sequence to an action  
 d) Mapping of environment sequence to an action
- 7) Which of the following machine requires input from humans but can interpret the outputs themselves?  
 a) Actuators  
 b) Sensor  
 c) Agents  
 d) AI system
- 8) Face Recognition system is based on which type of approach?  
 a) Weak AI approach  
 b) Applied AI approach  
 c) Cognitive AI approach  
 d) Strong AI approach

- 9) Which algorithm is used in the Game tree to make decisions of Win/Lose?
- a) Heuristic Search Algorithm
  - b) DFS/BFS algorithm
  - c) Greedy Search Algorithm
  - d) Min/Max algorithm
- 10) Among the given options, which is not the required property of Knowledge representation?
- a) Inferential Efficiency
  - b) Inferential Adequacy
  - c) Representational Verification
  - d) Representational Adequacy
- 11) What is the name of Artificial Intelligence which allows machines to handle vague information with a deftness that mimics human intuition?
- a) Human intelligence
  - b) Boolean logic
  - c) Functional logic
  - d) Fuzzy logic
- 12) The available ways to solve a problem of state-space-search.
- a) 1
  - b) 2
  - c) 3
  - d) 4
- 13) Which agent deals with the happy and unhappy state?
- a) Utility-based agent
  - b) Goal-based agent
  - c) Model-based agent
  - d) Learning agents
- 14) Automatic Reasoning tool is used in \_\_\_\_.
- a) Personal Computers
  - b) Microcomputers
  - c) LISP Machines
  - d) All of the above

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Attempt any five. 30**

- a) Give some real-world applications of AI
- b) How Artificial intelligence. Machine Learning, and Deep Learning differ from each other?
- c) What are the types of Machine Learning?
- d) What is NLP? What are the various components of NLP?
- e) What is Bayes rule explain Bayes rule with example?
- f) Explain Sequential decision problem with example.
- g) What is reinforcement learning? How does reinforcement learning work?

**Q.3 Attempt any two. 16**

- a) What is the difference between supervised and unsupervised learning in AI?
- b) Explain Game theory in AI. How many types of game theory in AI.
- c) Write a note BFS and DFS with example.

**Q.4 Solve any one. 10**

- a) Write a short note on AI in the present and in the future.
- b) i) Blind Search (Uninformed search)
  - 1) Iterative deepening search
  - 2) Bidirectional search
- ii) Informed Search

Seat No.	
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Set Q
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Face Recognition system is based on which type of approach?
  - a) Weak AI approach
  - b) Applied AI approach
  - c) Cognitive AI approach
  - d) Strong AI approach
- 2) Which algorithm is used in the Game tree to make decisions of Win/Lose?
  - a) Heuristic Search Algorithm
  - b) DFS/BFS algorithm
  - c) Greedy Search Algorithm
  - d) Min/Max algorithm
- 3) Among the given options, which is not the required property of Knowledge representation?
  - a) Inferential Efficiency
  - b) Inferential Adequacy
  - c) Representational Verification
  - d) Representational Adequacy
- 4) What is the name of Artificial Intelligence which allows machines to handle vague information with a deftness that mimics human intuition?
  - a) Human intelligence
  - b) Boolean logic
  - c) Functional logic
  - d) Fuzzy logic
- 5) The available ways to solve a problem of state-space-search.
  - a) 1
  - b) 2
  - c) 3
  - d) 4
- 6) Which agent deals with the happy and unhappy state?
  - a) Utility-based agent
  - b) Goal-based agent
  - c) Model-based agent
  - d) Learning agents
- 7) Automatic Reasoning tool is used in \_\_\_\_\_.
  - a) Personal Computers
  - b) Microcomputers
  - c) LISP Machines
  - d) All of the above

- 8) Artificial Intelligence is about \_\_\_\_\_.  
a) Playing a game on Computer  
b) Making a machine Intelligent  
c) Programming on Machine with your Own Intelligence  
d) Putting your intelligence in Machine
- 9) Select the most appropriate situation for that a blind search can be used.  
a) Real-life situation  
b) Small Search Space  
c) Complex game  
d) All of the above
- 10) Among the given options, which search algorithm requires less memory?  
a) Optimal Search  
b) Depth-firstsearch  
c) Breadth-First Search  
d) Linear Search
- 11) Which of the following is the branch of Artificial Intelligence?  
a) Machine Learning  
b) Cyber forensics  
c) Full-Stack Developer  
d) Network Design
- 12) Which of the following is a component of Artificial Intelligence?  
a) Learning  
b) Training  
c) Designing cost  
d) Puzzling
- 13) What is the function of an Artificial Intelligence “Agent”?  
a) Mapping of goal sequence to an action  
b) Work without the direct interference of the people  
c) Mapping of precept sequence to an action  
d) Mapping of environment sequence to an action
- 14) Which of the following machine requires input from humans but can interpret the outputs themselves?  
a) Actuators  
b) Sensor  
c) Agents  
d) AI system



<b>Seat No.</b>	
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**Set Q**

**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Attempt any five. 30**

- a) Give some real-world applications of AI
- b) How Artificial intelligence. Machine Learning, and Deep Learning differ from each other?
- c) What are the types of Machine Learning?
- d) What is NLP? What are the various components of NLP?
- e) What is Bayes rule explain Bayes rule with example?
- f) Explain Sequential decision problem with example.
- g) What is reinforcement learning? How does reinforcement learning work?

**Q.3 Attempt any two. 16**

- a) What is the difference between supervised and unsupervised learning in AI?
- b) Explain Game theory in AI. How many types of game theory in AI.
- c) Write a note BFS and DFS with example.

**Q.4 Solve any one. 10**

- a) Write a short note on AI in the present and in the future.
- b) i) Blind Search (Uninformed search)
  - 1) Iterative deepening search
  - 2) Bidirectional search
- ii) Informed Search

Seat No.	
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is the name of Artificial Intelligence which allows machines to handle vague information with a deftness that mimics human intuition?
  - a) Human intelligence
  - b) Boolean logic
  - c) Functional logic
  - d) Fuzzy logic
- 2) The available ways to solve a problem of state-space-search.
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- 3) Which agent deals with the happy and unhappy state?
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  - d) Learning agents
- 4) Automatic Reasoning tool is used in \_\_\_\_\_.
  - a) Personal Computers
  - b) Microcomputers
  - c) LISP Machines
  - d) All of the above
- 5) Artificial Intelligence is about \_\_\_\_\_.
  - a) Playing a game on Computer
  - b) Making a machine Intelligent
  - c) Programming on Machine with your Own Intelligence
  - d) Putting your intelligence in Machine
- 6) Select the most appropriate situation for that a blind search can be used.
  - a) Real-life situation
  - b) Small Search Space
  - c) Complex game
  - d) All of the above
- 7) Among the given options, which search algorithm requires less memory?
  - a) Optimal Search
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  - c) Breadth-First Search
  - d) Linear Search
- 8) Which of the following is the branch of Artificial Intelligence?
  - a) Machine Learning
  - b) Cyber forensics
  - c) Full-Stack Developer
  - d) Network Design

- 9) Which of the following is a component of Artificial Intelligence?
- a) Learning
  - b) Training
  - c) Designing cost
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- 10) What is the function of an Artificial Intelligence “Agent”?
- a) Mapping of goal sequence to an action
  - b) Work without the direct interference of the people
  - c) Mapping of precept sequence to an action
  - d) Mapping of environment sequence to an action
- 11) Which of the following machine requires input from humans but can interpret the outputs themselves?
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  - c) Agents
  - d) AI system
- 12) Face Recognition system is based on which type of approach?
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  - d) Min/Max algorithm
- 14) Among the given options, which is not the required property of Knowledge representation?
- a) Inferential Efficiency
  - b) Inferential Adequacy
  - c) Representational Verification
  - d) Representational Adequacy

<b>Seat No.</b>	
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**Set**

<b>R</b>
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Attempt any five. 30**

- a) Give some real-world applications of AI
- b) How Artificial intelligence, Machine Learning, and Deep Learning differ from each other?
- c) What are the types of Machine Learning?
- d) What is NLP? What are the various components of NLP?
- e) What is Bayes rule explain Bayes rule with example?
- f) Explain Sequential decision problem with example.
- g) What is reinforcement learning? How does reinforcement learning work?

**Q.3 Attempt any two. 16**

- a) What is the difference between supervised and unsupervised learning in AI?
- b) Explain Game theory in AI. How many types of game theory in AI.
- c) Write a note BFS and DFS with example.

**Q.4 Solve any one. 10**

- a) Write a short note on AI in the present and in the future.
- b) i) Blind Search (Uninformed search)
  - 1) Iterative deepening search
  - 2) Bidirectional search
- ii) Informed Search

Seat No.	
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is the function of an Artificial Intelligence "Agent"?
  - a) Mapping of goal sequence to an action
  - b) Work without the direct interference of the people
  - c) Mapping of precept sequence to an action
  - d) Mapping of environment sequence to an action
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  - b) Sensor
  - c) Agents
  - d) AI system
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  - b) Inferential Adequacy
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  - d) Representational Adequacy
- 6) What is the name of Artificial Intelligence which allows machines to handle vague information with a deftness that mimics human intuition?
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  - b) Boolean logic
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- 7) The available ways to solve a problem of state-space-search.
  - a) 1
  - b) 2
  - c) 3
  - d) 4

- 8) Which agent deals with the happy and unhappy state?
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  - b) Goal-based agent
  - c) Model-based agent
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- 9) Automatic Reasoning tool is used in \_\_\_\_.
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  - c) Programming on Machine with your Own Intelligence
  - d) Putting your intelligence in Machine
- 11) Select the most appropriate situation for that a blind search can be used.
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  - b) Small Search Space
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- 13) Which of the following is the branch of Artificial Intelligence?
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  - b) Cyber forensics
  - c) Full-Stack Developer
  - d) Network Design
- 14) Which of the following is a component of Artificial Intelligence?
- a) Learning
  - b) Training
  - c) Designing cost
  - d) Puzzling

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Intelligence**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Attempt any five. 30**

- a) Give some real-world applications of AI
- b) How Artificial intelligence. Machine Learning, and Deep Learning differ from each other?
- c) What are the types of Machine Learning?
- d) What is NLP? What are the various components of NLP?
- e) What is Bayes rule explain Bayes rule with example?
- f) Explain Sequential decision problem with example.
- g) What is reinforcement learning? How does reinforcement learning work?

**Q.3 Attempt any two. 16**

- a) What is the difference between supervised and unsupervised learning in AI?
- b) Explain Game theory in AI. How many types of game theory in AI.
- c) Write a note BFS and DFS with example.

**Q.4 Solve any one. 10**

- a) Write a short note on AI in the present and in the future.
- b) i) Blind Search (Uninformed search)
  - 1) Iterative deepening search
  - 2) Bidirectional search
- ii) Informed Search

Seat No.	
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P

**T.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Object Oriented Modeling & Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ characterize mainstream object-oriented language.
  - a) Identity
  - b) Classification
  - c) Polymorphism
  - d) All of the above
- 2) A \_\_\_\_\_ represents the specification of an asynchronous stimulus communicated between instances.
  - a) Event
  - b) Process
  - c) Thread
  - d) Signal
- 3) Aggregation is a \_\_\_\_\_ relationship.
  - a) "is a part of"
  - b) "is a Kind of"
  - c) "is a replica of"
  - d) "Has a"
- 4) The triangle notation for \_\_\_\_\_ to connect a super class to its subclasses.
  - a) Generalization
  - b) Composition
  - c) Aggregation
  - d) None of the above
- 5) A module is a logical construct for \_\_\_\_\_.
  - a) Grouping Classes
  - b) Generalization
  - c) Association
  - d) All of the above
- 6) \_\_\_\_\_ is a Building Blocks of the UML.
  - a) Things
  - b) Diagrams
  - c) Relationships
  - d) All of the option
- 7) Composition is a stronger form of \_\_\_\_\_.
  - a) Aggregation
  - b) Inheritance
  - c) Encapsulation
  - d) All of the above
- 8) In object-oriented design
  - a) Operations and methods are identical
  - b) Methods specify algorithms whereas operations only state what is to be done
  - c) Methods do not change values of attributes
  - d) Methods and constructor are same



- 9) The Unified Modeling Language:
- a) is a notation useful for graphically depicting an object-oriented analysis or design model.
  - b) allows one to capture design decisions of a system.
  - c) promotes communication among key personnel involved in development.
  - d) All of the above
- 10) A class is divided into \_\_\_\_\_.  
a) Name compartment                      b) Operation compartment  
c) Attribute compartment                d) All of the above
- 11) In Unified Modelling Language, diagrams that organize system elements into groups are classified as \_\_\_\_\_.  
a) Package diagrams                      b) System diagrams  
c) Organized diagram                      d) Class diagrams
- 12) Components can be represented by which of the following \_\_\_\_\_.  
a) Component symbols  
b) Stereotypes  
c) Rectangular boxes  
d) Both component symbols & Stereotypes
- 13) UML provides which of these levels of visibility that can be applied to attributes and operations?  
a) Public                                      b) Protected and private  
c) Package                                    d) All of the mentioned
- 14) Weak entities are represented in UML diagrams by using aggregations called  
a) Qualified segregation                      b) Non-qualified aggregation  
c) Non-qualified segregation                d) Qualified aggregation

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Object Oriented Modeling & Design**

Day & Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**SECTION – I**

**Q.2 Attempt any Three.** **12**

- a) Explain object, links and association with diagram.
- b) Explain the inheritance concept with example.
- c) Explain state, event and operations with suitable diagram.
- d) Explain elements of data flow diagram with diagram.

**Q.3 Attempt any two.** **16**

- a) Explain object-oriented Styles.
- b) Draw a class model for Railway Reservation System.
- c) Explain about object diagram compiler.

**SECTION – II**

**Q.4 Attempt any Three.** **12**

- a) Explain state Machine Diagram in UML
- b) Explain Activity diagram with example
- c) Explain Deployment Diagram with example
- d) Write note on Object Oriented Language features?

**Q.5 Attempt any Two.** **16**

- a) Explain Core Elements of use case diagram for Hospital Management System.
- b) Explain State chart diagrams and Nested State Chart diagram in UML with example.
- c) Explain steps for building a Sequence Diagram in UML. Elaborate with an Example

Seat No.	
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Set Q
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**T.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Object Oriented Modeling & Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) In object-oriented design
  - a) Operations and methods are identical
  - b) Methods specify algorithms whereas operations only state what is to be done
  - c) Methods do not change values of attributes
  - d) Methods and constructor are same
- 2) The Unified Modeling Language:
  - a) is a notation useful for graphically depicting an object-oriented analysis or design model.
  - b) allows one to capture design decisions of a system.
  - c) promotes communication among key personnel involved in development.
  - d) All of the above
- 3) A class is divided into \_\_\_\_\_.
 

a) Name compartment	b) Operation compartment
c) Attribute compartment	d) All of the above
- 4) In Unified Modelling Language, diagrams that organize system elements into groups are classified as \_\_\_\_\_.
 

a) Package diagrams	b) System diagrams
c) Organized diagram	d) Class diagrams
- 5) Components can be represented by which of the following \_\_\_\_\_.
  - a) Component symbols
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- 6) UML provides which of these levels of visibility that can be applied to attributes and operations?
 

a) Public	b) Protected and private
c) Package	d) All of the mentioned

- 7) Weak entities are represented in UML diagrams by using aggregations called
- a) Qualified segregation
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  - c) Non-qualified segregation
  - d) Qualified aggregation
- 8) \_\_\_\_\_ characterize mainstream object-oriented language.
- a) Identity
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- 11) The triangle notation for \_\_\_\_\_ to connect a super class to its subclasses.
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- 13) \_\_\_\_\_ is a Building Blocks of the UML.
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  - c) Relationships
  - d) All of the option
- 14) Composition is a stronger form of \_\_\_\_\_.
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  - b) Inheritance
  - c) Encapsulation
  - d) All of the above

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Object Oriented Modeling & Design**

Day & Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
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**SECTION – I**

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**SECTION – II**

**Q.4 Attempt any Three.** **12**

- a) Explain state Machine Diagram in UML
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- d) Write note on Object Oriented Language features?

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- a) Explain Core Elements of use case diagram for Hospital Management System.
- b) Explain State chart diagrams and Nested State Chart diagram in UML with example.
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<b>Seat No.</b>	
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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

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Marks: 14

1) In Unified Modelling Language, diagrams that organize system elements into groups are classified as \_\_\_\_\_.

- Page 7 of 12

- 9) A module is a logical construct for \_\_\_\_\_.  
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c) Association                              d) All of the above
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a) Things                                      b) Diagrams  
c) Relationships                              d) All of the option
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c) promotes communication among key personnel involved in development.  
d) All of the above
- 14) A class is divided into \_\_\_\_\_.  
a) Name compartment                      b) Operation compartment  
c) Attribute compartment                      d) All of the above

Seat No.	
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R
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**T.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Object Oriented Modeling & Design**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**SECTION – I****Q.2 Attempt any Three.** **12**

- a) Explain object, links and association with diagram.
- b) Explain the inheritance concept with example.
- c) Explain state, event and operations with suitable diagram.
- d) Explain elements of data flow diagram with diagram.

**Q.3 Attempt any two.** **16**

- a) Explain object-oriented Styles.
- b) Draw a class model for Railway Reservation System.
- c) Explain about object diagram compiler.

**SECTION – II****Q.4 Attempt any Three.** **12**

- a) Explain state Machine Diagram in UML
- b) Explain Activity diagram with example
- c) Explain Deployment Diagram with example
- d) Write note on Object Oriented Language features?

**Q.5 Attempt any Two.** **16**

- a) Explain Core Elements of use case diagram for Hospital Management System.
- b) Explain State chart diagrams and Nested State Chart diagram in UML with example.
- c) Explain steps for building a Sequence Diagram in UML. Elaborate with an Example



Seat No.	
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**T.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Object Oriented Modeling & Design**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ is a Building Blocks of the UML.
  - a) Things
  - b) Diagrams
  - c) Relationships
  - d) All of the option
- 2) Composition is a stronger form of \_\_\_\_\_.
  - a) Aggregation
  - b) Inheritance
  - c) Encapsulation
  - d) All of the above
- 3) In object-oriented design
  - a) Operations and methods are identical
  - b) Methods specify algorithms whereas operations only state what is to be done
  - c) Methods do not change values of attributes
  - d) Methods and constructor are same
- 4) The Unified Modeling Language:
  - a) is a notation useful for graphically depicting an object-oriented analysis or design model.
  - b) allows one to capture design decisions of a system.
  - c) promotes communication among key personnel involved in development.
  - d) All of the above
- 5) A class is divided into \_\_\_\_\_.
  - a) Name compartment
  - b) Operation compartment
  - c) Attribute compartment
  - d) All of the above
- 6) In Unified Modelling Language, diagrams that organize system elements into groups are classified as \_\_\_\_\_.
  - a) Package diagrams
  - b) System diagrams
  - c) Organized diagram
  - d) Class diagrams
- 7) Components can be represented by which of the following \_\_\_\_\_.
  - a) Component symbols
  - b) Stereotypes
  - c) Rectangular boxes
  - d) Both component symbols & Stereotypes

- 8) UML provides which of these levels of visibility that can be applied to attributes and operations?
- a) Public
  - b) Protected and private
  - c) Package
  - d) All of the mentioned
- 9) Weak entities are represented in UML diagrams by using aggregations called
- a) Qualified segregation
  - b) Non-qualified aggregation
  - c) Non-qualified segregation
  - d) Qualified aggregation
- 10) \_\_\_\_\_ characterize mainstream object-oriented language.
- a) Identity
  - b) Classification
  - c) Polymorphism
  - d) All of the above
- 11) A \_\_\_\_\_ represents the specification of an asynchronous stimulus communicated between instances.
- a) Event
  - b) Process
  - c) Thread
  - d) Signal
- 12) Aggregation is a \_\_\_\_\_ relationship.
- a) "is a part of"
  - b) "is a Kind of"
  - c) "is a replica of"
  - d) "Has a"
- 13) The triangle notation for \_\_\_\_\_ to connect a super class to its subclasses.
- a) Generalization
  - b) Composition
  - c) Aggregation
  - d) None of the above
- 14) A module is a logical construct for \_\_\_\_\_.
- a) Grouping Classes
  - b) Generalization
  - c) Association
  - d) All of the above

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Set **S**

**T.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Object Oriented Modeling & Design**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**SECTION – I****Q.2 Attempt any Three. 12**

- Explain object, links and association with diagram.
- Explain the inheritance concept with example.
- Explain state, event and operations with suitable diagram.
- Explain elements of data flow diagram with diagram.

**Q.3 Attempt any two. 16**

- Explain object-oriented Styles.
- Draw a class model for Railway Reservation System.
- Explain about object diagram compiler.

**SECTION – II****Q.4 Attempt any Three. 12**

- Explain state Machine Diagram in UML
- Explain Activity diagram with example
- Explain Deployment Diagram with example
- Write note on Object Oriented Language features?

**Q.5 Attempt any Two. 16**

- Explain Core Elements of use case diagram for Hospital Management System.
- Explain State chart diagrams and Nested State Chart diagram in UML with example.
- Explain steps for building a Sequence Diagram in UML. Elaborate with an Example

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P
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Neural Network**

Day & Date: Friday 24-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The application/applications of Artificial Intelligence is/are
  - a) Expert Systems
  - b) Gaming
  - c) Vision Systems
  - d) All of the above
- 2) Which agent deals with the happy and unhappy state?
  - a) Utility-based agent
  - b) Model-based agent
  - c) Goal-based Agent
  - d) Learning Agent
- 3) What are the compositions for agents in artificial intelligence?
  - a) Program
  - b) Architecture
  - c) Both Program and Architecture
  - d) None of the mentioned
- 4) How do you represent "All dogs have tails"?
  - a)  $\forall x: \text{dog}(x) \rightarrow \text{hastail}(x)$
  - b)  $\forall x: \text{dog}(x) \rightarrow \text{hastail}(y)$
  - c)  $\forall x: \text{dog}(y) \rightarrow \text{hastail}(x)$
  - d)  $\forall x: \text{dog}(x) \rightarrow \text{hasatail}(x)$
- 5) The process of removing detail from a given state representation is called
  - a) Extraction
  - b) Abstraction
  - c) Information Retrieval
  - d) Mining of data
- 6) Which of the Following problems can be modelled as CSP?
  - a) 8-Puzzle problem
  - b) 8-Queen problem
  - c) Map Coloring problem
  - d) All of the mentioned
- 7) Zero sum games are the one in which there are two agents whose actions must alternate and in which the utility values at the end of the game are always the same.
  - a) True
  - b) False
- 8) Where does the Baye's rule can be used?
  - a) Solving queries
  - b) Increasing complexity
  - c) Decreasing complexity
  - d) Answering probabilistic query



Seat No.	
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Set **P**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Neural Network**

Day & Date: Friday 24-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 56

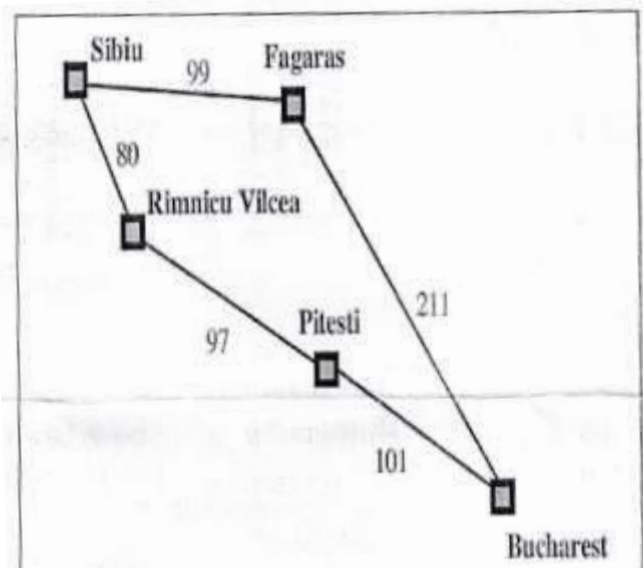
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Q.2 Answer the following (Any Five) 30**

- Describe the Components that define a well-defined search problem.
- Differentiate between informed and uninformed search algorithm.
- Explain A\* searching technique in detail with example. Discuss conditions for the optimality of this technique.
- With an example AND-OR Graph in detail.
- Write a note on Monotonic Reasoning and Non-Monotonic Reasoning with example.
- Differentiate between Supervised Learning and Unsupervised Learning.

**Q.3 Answer the following (Any Two) 16**

- For each of the following activities, give a PEAS description of the task environment and characterize it in terms of the properties listed in Section like
  - Interactive English Tutor
  - Taxi Driver
- Explain Uniform Cost Search Algorithm and find the shortest path between Sibiu and Bucharest using Uniform Cost Search Algorithm.



- With proper example explain Decision tree and the types of nodes in Decision tree.

**Q.4 Attempt the following.****Consider a vocabulary with the following symbols:**

- i) Occupation ( $p, o$ ): Predicate. Person  $p$  has occupation  $o$ .
- ii) Customer ( $p_1, p_2$ ): Predicate. Person  $p_1$  is a customer of person  $p_2$ .
- iii) Boss ( $p_1, p_2$ ): Predicate. Person  $p_1$  is a boss of person  $p_2$ .
- iv) Doctor, Surgeon, Lawyer, Actor: Constants denoting occupations.
- v) Emily, Joe: Constants denoting people.

**Use these symbols to write the following assertions in first-order logic:**

- a) Emily is either a surgeon or a lawyer.
- b) Joe is an actor, but he also holds another job.
- c) All surgeons are doctors.
- d) Joe does not have a lawyer (i.e., is not a customer of any lawyer).
- e) Emily has a boss who is a lawyer.
- f) There exists a lawyer all of whose customers are doctors.
- g) Every surgeon has a lawyer.

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Set Q
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Neural Network**

Day & Date: Friday 24-02-2023  
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Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Where does the Baye's rule can be used?
  - a) Solving queries
  - b) Increasing complexity
  - c) Decreasing complexity
  - d) Answering probabilistic query
- 2) Chance Nodes are represented by \_\_\_\_\_.
  - a) Disks
  - b) Squares
  - c) Circles
  - d) Triangles
- 3) Which of the following is also called as exploratory learning?
  - a) Supervised learning
  - b) Active learning
  - c) Unsupervised learning
  - d) Reinforcement learning
- 4) A\* is optimal if  $h(n)$  is an admissible heuristic-that is, provided that  $h(n)$  never underestimates the cost to reach the goal.
  - a) True
  - b) False
- 5) A\* algorithm is based on \_\_\_\_\_.
  - a) Breadth-First-Search
  - b) Depth-First -Search
  - c) Best-First-Search
  - d) Hill climbing
- 6) Which rule is applied for the Simple reflex agent?
  - a) Simple-action rule
  - b) Simple & Condition-action rule
  - c) Condition-action rule
  - d) None of the above
- 7) Which of the following uses machine-learning technology to become smarter and more capable of understanding natural language questions and requests?
  - a) Netflix
  - b) Siri
  - c) Cogito
  - d) Deepblue
- 8) The application/applications of Artificial Intelligence is/are
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- 10) What are the compositions for agents in artificial intelligence?
- a) Program
  - b) Architecture
  - c) Both Program and Architecture
  - d) None of the mentioned
- 11) How do you represent "All dogs have tails"?
- a)  $\forall x: \text{dog}(x) \rightarrow \text{hastail}(x)$
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- 12) The process of removing detail from a given state representation is called
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- 13) Which of the Following problems can be modelled as CSP?
- a) 8-Puzzle problem
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  - c) Map Coloring problem
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- a) True
  - b) False

Seat No.	
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Set **Q**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Neural Network**

Day & Date: Friday 24-02-2023  
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Max. Marks: 56

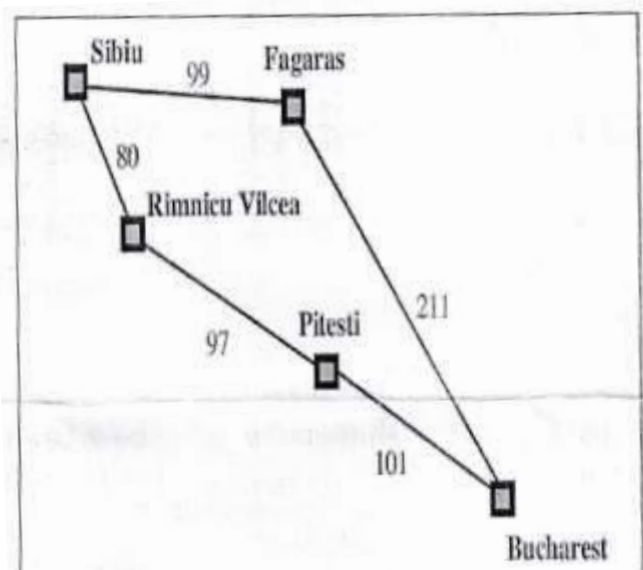
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**Q.2 Answer the following (Any Five)****30**

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- With an example AND-OR Graph in detail.
- Write a note on Monotonic Reasoning and Non-Monotonic Reasoning with example.
- Differentiate between Supervised Learning and Unsupervised Learning.

**Q.3 Answer the following (Any Two)****16**

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Day & Date: Friday 24-02-2023  
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Neural Network**

### MCQ/Objective Type Questions

Marks:14

14

- Page 9 of 16

- 9) The process of removing detail from a given state representation is called
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  - b) Active learning
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Neural Network**

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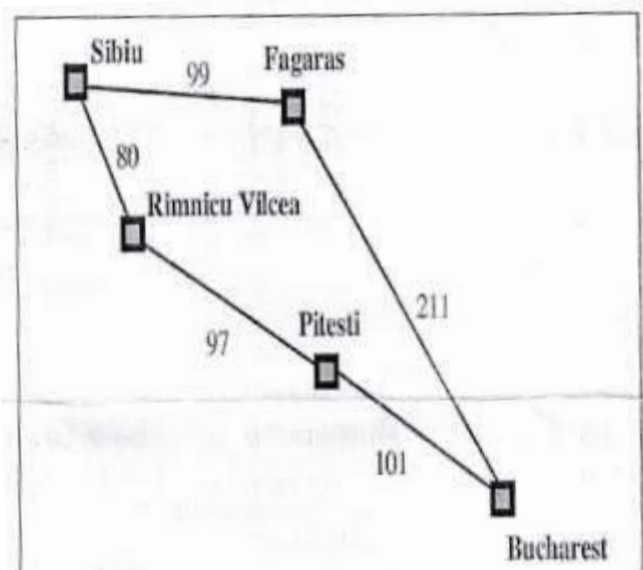
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**Q.3 Answer the following (Any Two)****16**

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Neural Network**

Day & Date: Friday 24-02-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

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- 2) Zero sum games are the one in which there are two agents whose actions must alternate and in which the utility values at the end of the game are always the same.  
 a) True    b) False
- 3) Where does the Baye's rule can be used?  
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- 9) Which of the following uses machine-learning technology to become smarter and more capable of understanding natural language questions and requests?
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  - b) Abstraction
  - c) Information Retrieval
  - d) Mining of data

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Set **S**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Artificial Neural Network**

Day & Date: Friday 24-02-2023  
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Max. Marks: 56

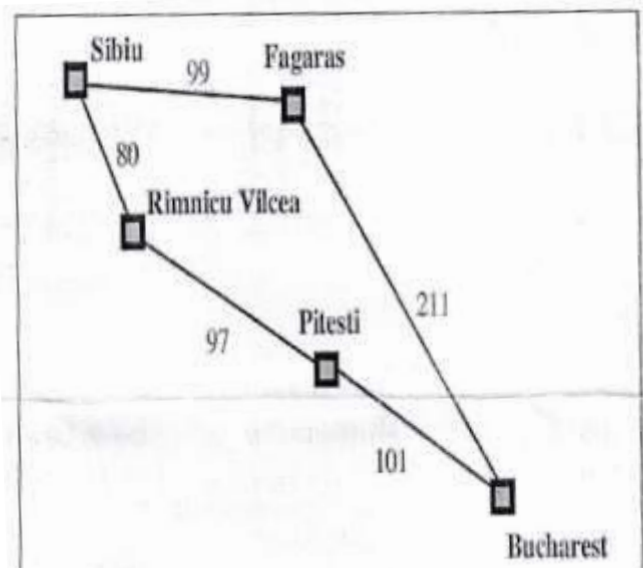
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- With proper example explain Decision tree and the types of nodes in Decision tree.

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- iii) Boss (p1, p2): Predicate. Person p1 is a boss of person p2.
- iv) Doctor, Surgeon, Lawyer, Actor: Constants denoting occupations.
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- e) Emily has a boss who is a lawyer.
- f) There exists a lawyer all of whose customers are doctors.
- g) Every surgeon has a lawyer.

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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Science**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not a supervised learning algorithm?
 

a) Decision Tree	b) Naive Bayesian
c) PCA	d) Linear Regression
- 2) A Data Scientist \_\_\_\_\_
 

a) Asks the right questions
b) Performs data wrangling and data visualization
c) Acquires data
d) All of the above
- 3) Mean, Mode, Median, Range, Variance are types of \_\_\_\_\_ statistic.
 

a) Inferential statistic	b) Descriptive statistic
c) Both a and b	d) None of the above
- 4) Which of the following sentence is FALSE regarding regression?
 

a) It is used for interpretation	b) It discovers casual relationship
c) It relates input to output	d) It is used for predication
- 5) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text Select one:
 

a) Linear Algebra	b) Statistics
c) Data mining	d) Natural Language Processing
- 6) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.
 

a) Under fitting	b) None
c) Over fitting	d) Cost function
- 7) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
 

a) matplotlib	b) sklearn
c) scipy	d) numpy

- 8) \_\_\_\_\_ method is used to avoid over fitting.
- a) Regularization
  - b) Dimensionality reduction
  - c) Rule based machine learning
  - d) Bayesian
- 9) Which of the following plots can be used to detect an outlier?
- a) Boxplot
  - b) Histogram
  - c) Scatter plot
  - d) All of the above
- 10) Can decision trees be used for performing clustering? State True/False
- a) True
  - b) False
- 11) Which of the following cannot be a component of time series data?
- a) Trend
  - b) Seasonality
  - c) Noise
  - d) None of the above
- 12) Tokenization, is a way to \_\_\_\_\_
- a) Find the grammar of the text
  - b) Split text data into words, phrases and idioms
  - c) Analyze the sentence structure
  - d) Find ambiguities
- 13) Which of the following is a branch of statistics?
- a) Inferential statistic
  - b) Descriptive statistic
  - c) Both a and b
  - d) None of the above
- 14) Which of the following library is use to plot Heatmap?
- a) Matplotlib
  - b) Seaborn
  - c) Scikit-learn
  - d) Nltk

Seat No.	
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Set	P
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Science**

Day & Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**SECTION – I**

**Q.2 Attempt any Three.** **12**

- a) Describe Data Science. Summarize the components of Data Science.
- b) What is NLTK? Explain the various functionality provided in NLTK.
- c) Illustrate why data visualization is needed in data analytics. In python how data visualization takes place.
- d) Explain Simpson's Paradox with example.

**Q.3 Attempt any Two.** **16**

- a) Define Web scrapping. Elaborate the process of web scrapping in detail. Write advantages of web scrapping.
- b) Describe Data preprocessing in data science, why it is important? Explain the steps involve in data preprocessing.
- c) What is statistics? Describe descriptive statistic with example.

**SECTION – II**

**Q.4 Attempt any Three.** **12**

- a) Describe Naïve Bayes classifier. Also example its applications.
- b) What is sentimental analysis example with their example.
- c) Write a short note on overfitting & underfitting.
- d) Elaborate the working of Support Vector Machine (SVM).

**Q.5 Attempt any Two.** **16**

- a) Define Machine Learning. Also describe the need of ML. Explain supervised machine learning with example
- b) Explain Decision Tree algorithm with example. List its advantages and disadvantages.
- c) Explain the K-Nearest Neighbours algorithm with suitable examples.

Seat No.	
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Set Q
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Science**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ method is used to avoid over fitting.
  - a) Regularization
  - b) Dimensionality reduction
  - c) Rule based machine learning
  - d) Bayesian
- 2) Which of the following plots can be used to detect an outlier?
  - a) Boxplot
  - b) Histogram
  - c) Scatter plot
  - d) All of the above
- 3) Can decision trees be used for performing clustering? State True/False
  - a) True
  - b) False
- 4) Which of the following cannot be a component of time series data?
  - a) Trend
  - b) Seasonality
  - c) Noise
  - d) None of the above
- 5) Tokenization, is a way to \_\_\_\_\_
  - a) Find the grammar of the text
  - b) Split text data into words, phrases and idioms
  - c) Analyze the sentence structure
  - d) Find ambiguities
- 6) Which of the following is a branch of statistics?
  - a) Inferential statistic
  - b) Descriptive statistic
  - c) Both a and b
  - d) None of the above
- 7) Which of the following library is use to plot Heatmap?
  - a) Matplotlib
  - b) Seaborn
  - c) Scikit-learn
  - d) Nltk
- 8) Which of the following is not a supervised learning algorithm?
  - a) Decision Tree
  - b) Naive Bayesian
  - c) PCA
  - d) Linear Regression

- 9) A Data Scientist \_\_\_\_\_  
a) Asks the right questions  
b) Performs data wrangling and data visualization  
c) Acquires data  
d) All of the above
- 10) Mean, Mode, Median, Range, Variance are types of \_\_\_\_\_ statistic.  
a) Inferential statistic                      b) Descriptive statistic  
c) Both a and b                                d) None of the above
- 11) Which of the following sentence is FALSE regarding regression?  
a) It is used for interpretation              b) It discovers casual relationship  
c) It relates input to output                d) It is used for predication
- 12) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text Select one:  
a) Linear Algebra                              b) Statistics  
c) Data mining                                 d) Natural Language Processing
- 13) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.  
a) Under fitting                                b) None  
c) Over fitting                                 d) Cost function
- 14) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.  
a) matplotlib                                    b) sklearn  
c) scipy    d) numpy



Seat No.	
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Science**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**SECTION – I****Q.2 Attempt any Three. 12**

- Describe Data Science. Summarize the components of Data Science.
- What is NLTK? Explain the various functionality provided in NLTK.
- Illustrate why data visualization is needed in data analytics. In python how data visualization takes place.
- Explain Simpson's Paradox with example.

**Q.3 Attempt any Two. 16**

- Define Web scrapping. Elaborate the process of web scrapping in detail. Write advantages of web scrapping.
- Describe Data preprocessing in data science, why it is important? Explain the steps involve in data preprocessing.
- What is statistics? Describe descriptive statistic with example.

**SECTION – II****Q.4 Attempt any Three. 12**

- Describe Naïve Bayes classifier. Also example its applications.
- What is sentimental analysis example with their example.
- Write a short note on overfitting & underfitting.
- Elaborate the working of Support Vector Machine (SVM).

**Q.5 Attempt any Two. 16**

- Define Machine Learning. Also describe the need of ML. Explain supervised machine learning with example
- Explain Decision Tree algorithm with example. List its advantages and disadvantages.
- Explain the K-Nearest Neighbours algorithm with suitable examples.

Seat No.	
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Set	R
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Science**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following cannot be a component of time series data?
  - a) Trend
  - b) Seasonality
  - c) Noise
  - d) None of the above
- 2) Tokenization, is a way to \_\_\_\_\_.
  - a) Find the grammar of the text
  - b) Split text data into words, phrases and idioms
  - c) Analyze the sentence structure
  - d) Find ambiguities
- 3) Which of the following is a branch of statistics?
  - a) Inferential statistic
  - b) Descriptive statistic
  - c) Both a and b
  - d) None of the above
- 4) Which of the following library is use to plot Heatmap?
  - a) Matplotlib
  - b) Seaborn
  - c) Scikit-learn
  - d) Nltk
- 5) Which of the following is not a supervised learning algorithm?
  - a) Decision Tree
  - b) Naive Bayesian
  - c) PCA
  - d) Linear Regression
- 6) A Data Scientist \_\_\_\_\_.
  - a) Asks the right questions
  - b) Performs data wrangling and data visualization
  - c) Acquires data
  - d) All of the above
- 7) Mean, Mode, Median, Range, Variance are types of \_\_\_\_\_ statistic.
  - a) Inferential statistic
  - b) Descriptive statistic
  - c) Both a and b
  - d) None of the above
- 8) Which of the following sentence is FALSE regarding regression?
  - a) It is used for interpretation
  - b) It discovers casual relationship
  - c) It relates input to output
  - d) It is used for predication

- 9) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text Select one:
- a) Linear Algebra
  - b) Statistics
  - c) Data mining
  - d) Natural Language Processing
- 10) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.
- a) Under fitting
  - b) None
  - c) Over fitting
  - d) Cost function
- 11) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
- a) matplotlib
  - b) sklearn
  - c) scipy
  - d) numpy
- 12) \_\_\_\_\_ method is used to avoid over fitting.
- a) Regularization
  - b) Dimensionality reduction
  - c) Rule based machine learning
  - d) Bayesian
- 13) Which of the following plots can be used to detect an outlier?
- a) Boxplot
  - b) Histogram
  - c) Scatter plot
  - d) All of the above
- 14) Can decision trees be used for performing clustering? State True/False
- a) True
  - b) False

Seat No.	
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Set	R
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Science**

Day & Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**SECTION – I**

**Q.2 Attempt any Three.** **12**

- a) Describe Data Science. Summarize the components of Data Science.
- b) What is NLTK? Explain the various functionality provided in NLTK.
- c) Illustrate why data visualization is needed in data analytics. In python how data visualization takes place.
- d) Explain Simpson's Paradox with example.

**Q.3 Attempt any Two.** **16**

- a) Define Web scrapping. Elaborate the process of web scrapping in detail. Write advantages of web scrapping.
- b) Describe Data preprocessing in data science, why it is important? Explain the steps involve in data preprocessing.
- c) What is statistics? Describe descriptive statistic with example.

**SECTION – II**

**Q.4 Attempt any Three.** **12**

- a) Describe Naïve Bayes classifier. Also example its applications.
- b) What is sentimental analysis example with their example.
- c) Write a short note on overfitting & underfitting.
- d) Elaborate the working of Support Vector Machine (SVM).

**Q.5 Attempt any Two.** **16**

- a) Define Machine Learning. Also describe the need of ML. Explain supervised machine learning with example
- b) Explain Decision Tree algorithm with example. List its advantages and disadvantages.
- c) Explain the K-Nearest Neighbours algorithm with suitable examples.

Seat No.	
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Science**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.
  - a) Under fitting
  - b) None
  - c) Over fitting
  - d) Cost function
- 2) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
  - a) matplotlib
  - b) sklearn
  - c) scipy
  - d) numpy
- 3) \_\_\_\_\_ method is used to avoid over fitting.
  - a) Regularization
  - b) Dimensionality reduction
  - c) Rule based machine learning
  - d) Bayesian
- 4) Which of the following plots can be used to detect an outlier?
  - a) Boxplot
  - b) Histogram
  - c) Scatter plot
  - d) All of the above
- 5) Can decision trees be used for performing clustering? State True/False
  - a) True
  - b) False
- 6) Which of the following cannot be a component of time series data?
  - a) Trend
  - b) Seasonality
  - c) Noise
  - d) None of the above
- 7) Tokenization, is a way to \_\_\_\_\_
  - a) Find the grammar of the text
  - b) Split text data into words, phrases and idioms
  - c) Analyze the sentence structure
  - d) Find ambiguities
- 8) Which of the following is a branch of statistics?
  - a) Inferential statistic
  - b) Descriptive statistic
  - c) Both a and b
  - d) None of the above
- 9) Which of the following library is use to plot Heatmap?
  - a) Matplotlib
  - b) Seaborn
  - c) Scikit-learn
  - d) Nltk

- 10)** Which of the following is not a supervised learning algorithm?
- |                  |                      |
|------------------|----------------------|
| a) Decision Tree | b) Naive Bayesian    |
| c) PCA           | d) Linear Regression |
- 11)** A Data Scientist \_\_\_\_\_
- |   |
|---|
| a) Asks the right questions                       |
| b) Performs data wrangling and data visualization |
| c) Acquires data                                  |
| d) All of the above                               |
- 12)** Mean, Mode, Median, Range, Variance are types of \_\_\_\_\_ statistic.
- |                          |                          |
|--------------------------|--------------------------|
| a) Inferential statistic | b) Descriptive statistic |
| c) Both a and b          | d) None of the above     |
- 13)** Which of the following sentence is FALSE regarding regression?
- |                                  |                                     |
|----------------------------------|-------------------------------------|
| a) It is used for interpretation | b) It discovers casual relationship |
| c) It relates input to output    | d) It is used for predication       |
- 14)** \_\_\_\_\_ is the ability to train computer to understand both human speech and written text Select one:
- |                   |                                |
|-------------------|--------------------------------|
| a) Linear Algebra | b) Statistics                  |
| c) Data mining    | d) Natural Language Processing |

Seat No.	
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Science**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**SECTION – I****Q.2 Attempt any Three. 12**

- Describe Data Science. Summarize the components of Data Science.
- What is NLTK? Explain the various functionality provided in NLTK.
- Illustrate why data visualization is needed in data analytics. In python how data visualization takes place.
- Explain Simpson's Paradox with example.

**Q.3 Attempt any Two. 16**

- Define Web scrapping. Elaborate the process of web scrapping in detail. Write advantages of web scrapping.
- Describe Data preprocessing in data science, why it is important? Explain the steps involve in data preprocessing.
- What is statistics? Describe descriptive statistic with example.

**SECTION – II****Q.4 Attempt any Three. 12**

- Describe Naïve Bayes classifier. Also example its applications.
- What is sentimental analysis example with their example.
- Write a short note on overfitting & underfitting.
- Elaborate the working of Support Vector Machine (SVM).

**Q.5 Attempt any Two. 16**

- Define Machine Learning. Also describe the need of ML. Explain supervised machine learning with example
- Explain Decision Tree algorithm with example. List its advantages and disadvantages.
- Explain the K-Nearest Neighbours algorithm with suitable examples.

Seat No.	
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Set	P
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**UI/UX/ Technology**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) All questions are compulsory.  
 2) Figure to right indicate full marks.  
 3) Assume suitable data if required and state it clearly.

**Q.1 Attempt any five (6 marks each. 5x6 marks = 30 marks). 30**

**a)** Consider the following CSS.

```
<style type="text/css">
i.   p.margin{
      1.  margin: 2cm 2cm 1cm 2cm;
      2.  border: thick solid red;
      3.  padding-top: 0.5%
    ii.  }
</style>
```

Give its meaning and effect when it applies to a paragraph in your page.

- b)** How can you define user-defined objects in JavaScript? Explain with example.
- c)** List and explain the differences between HTML and XHTML with respect to element.
- d)** What is a responsive design?
- e)** Explain how does parameters passing work in JavaScript.
- f)** List and explain the steps to define a local site in Dreamweaver.

**Q.2 Attempt any two (10 marks each. 2 x 10 marks = 20 marks). 20**

- a)** Explain DOM event handling and levels in DOM.
- b)** Explain the frames and table tags of HTML with suitable example.
- c)** Explain the basic process of event-driven computation in creating JavaScript.



Seat No.	
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Set Q
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**UI/UX/ Technology**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) All questions are compulsory.  
 2) Figure to right indicate full marks.  
 3) Assume suitable data if required and state it clearly.

**Q.1 Attempt any five (6 marks each. 5x6 marks = 30 marks). 30**

**a)** Consider the following CSS.

```
<style type="text/css">
i.  p.margin{
      1.  margin: 2cm 2cm 1cm 2cm;
      2.  border: thick solid red;
      3.  padding-top: 0.5%
ii.  }
</style>
```

Give its meaning and effect when it applies to a paragraph in your page.

- b)** How can you define user-defined objects in JavaScript? Explain with example.
- c)** List and explain the differences between HTML and XHTML with respect to element.
- d)** What is a responsive design?
- e)** Explain how does parameters passing work in JavaScript.
- f)** List and explain the steps to define a local site in Dreamweaver.

**Q.2 Attempt any two (10 marks each. 2 x 10 marks = 20 marks). 20**

- a)** Explain DOM event handling and levels in DOM.
- b)** Explain the frames and table tags of HTML with suitable example.
- c)** Explain the basic process of event-driven computation in creating JavaScript.

Seat No.	
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Set	R
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**UI/UX/ Technology**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) All questions are compulsory.  
 2) Figure to right indicate full marks.  
 3) Assume suitable data if required and state it clearly.

**Q.1 Attempt any five (6 marks each. 5x6 marks = 30 marks).** **30**

**a)** Consider the following CSS.

```
<style type="text/css">
i.   p.margin{
      1.  margin: 2cm 2cm 1cm 2cm;
      2.  border: thick solid red;
      3.  padding-top: 0.5%
    ii.  }
</style>
```

Give its meaning and effect when it applies to a paragraph in your page.

- b)** How can you define user-defined objects in JavaScript? Explain with example.
- c)** List and explain the differences between HTML and XHTML with respect to element.
- d)** What is a responsive design?
- e)** Explain how does parameters passing work in JavaScript.
- f)** List and explain the steps to define a local site in Dreamweaver.

**Q.2 Attempt any two (10 marks each. 2 x 10 marks = 20 marks).** **20**

- a)** Explain DOM event handling and levels in DOM.
- b)** Explain the frames and table tags of HTML with suitable example.
- c)** Explain the basic process of event-driven computation in creating JavaScript.

Seat No.	
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Set	S
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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**UI/UX/ Technology**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) All questions are compulsory.  
 2) Figure to right indicate full marks.  
 3) Assume suitable data if required and state it clearly.

**Q.1 Attempt any five (6 marks each. 5x6 marks = 30 marks). 30**

**a)** Consider the following CSS.

```
<style type="text/css">
i.   p.margin{
      1.  margin: 2cm 2cm 1cm 2cm;
      2.  border: thick solid red;
      3.  padding-top: 0.5%
    ii.  }
</style>
```

Give its meaning and effect when it applies to a paragraph in your page.

- b)** How can you define user-defined objects in JavaScript? Explain with example.
- c)** List and explain the differences between HTML and XHTML with respect to element.
- d)** What is a responsive design?
- e)** Explain how does parameters passing work in JavaScript.
- f)** List and explain the steps to define a local site in Dreamweaver.

**Q.2 Attempt any two (10 marks each. 2 x 10 marks = 20 marks). 20**

- a)** Explain DOM event handling and levels in DOM.
- b)** Explain the frames and table tags of HTML with suitable example.
- c)** Explain the basic process of event-driven computation in creating JavaScript.

<b>Seat No.</b>	
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- 9)** Microsoft uses and release code under a variety of licenses including \_\_\_\_.
- |        |                        |
|--------|------------------------|
| a) gpl | b) apache              |
| c) ibm | d) gnu project license |
- 10)** Richard Stallman from MIT, established a special license, the \_\_\_\_\_ license.
- |            |               |
|------------|---------------|
| a) GNU     | b) Free       |
| c) Package | d) Commercial |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Licences and Practices**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions from Q.2 to Q.7.  
2) Figures to the right indicates full marks

<b>Attempt any Four (Each carries 10 marks)</b>		<b>40</b>
<b>Q.2</b>	With help of examples explain issues with copyright.	<b>10</b>
<b>Q.3</b>	Briefly explain The self-Enforcing Nature of Open Source and Free Software Licenses.	<b>10</b>
<b>Q.4</b>	Explain in detail Sun Community Source License.	<b>10</b>
<b>Q.5</b>	Explain in detail Multiple and Cross Licensing.	<b>10</b>
<b>Q.6</b>	Explain various types of Software Licenses.	<b>10</b>
<b>Q.7</b>	Briefly Discuss legal impact of open Source and free Software Licensing giving relevant example highlighting the impact.	<b>10</b>

Seat No.	
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Set Q
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Licences and Practices**

Day & Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.** **10**

- 1) The open source method for creating software rely on developers who voluntarily revel code in the expectation that other developers will reciprocate is called \_\_\_\_\_.  
 a) open source property                      b) intellectual property  
 c) software property                          d) licensing property
- 2) \_\_\_\_\_ is a legal instrument governing the usage or redistribution of the software.  
 a) GNU Public License                      b) Reciprocal License  
 c) Software License                          d) Academic License
- 3) Dual licensing is also called as \_\_\_\_\_.  
 a) tri-licensing                                  b) business licensing  
 c) multi licensing                              d) software licensing
- 4) Microsoft uses and release code under a variety of licenses including \_\_\_\_.  
 a) gpl    b) apache  
 c) ibm     d) gnu project license
- 5) Richard Stallman from MIT, established a special license, the \_\_\_\_\_.  
 a) GNU    b) Free  
 c) Package                                        d) Commercial
- 6) The copyright board shall be deemed to be a \_\_\_\_\_.  
 a) Supreme Court                              b) High Court  
 c) Civil Court                                    d) Criminal Court
- 7) In India first Copyright Act was passed in \_\_\_\_\_.  
 a) 1914    b) 1709  
 c) 1911    d) 1842
- 8) The user must agree to the \_\_\_\_\_ terms and agreements when they use as a open source software.  
 a) System     b) License  
 c) Community                                   d) Programmer

- 9)** Which of the following is not an open source Software?
- a) Linux
  - b) Ubuntu
  - c) Open Office
  - d) Windows 10
- 10)** Which of the following is a disadvantage of 'proprietary' software?
- a) You need to be an expert to edit code
  - b) You have to pay for this type of software
  - c) Its often free
  - d) You can edit the source code to customize it



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Licences and Practices**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any four questions from Q.2 to Q.7.  
2) Figures to the right indicates full marks

<b>Attempt any Four (Each carries 10 marks)</b>		<b>40</b>
<b>Q.2</b>	With help of examples explain issues with copyright.	<b>10</b>
<b>Q.3</b>	Briefly explain The self-Enforcing Nature of Open Source and Free Software Licenses.	<b>10</b>
<b>Q.4</b>	Explain in detail Sun Community Source License.	<b>10</b>
<b>Q.5</b>	Explain in detail Multiple and Cross Licensing.	<b>10</b>
<b>Q.6</b>	Explain various types of Software Licenses.	<b>10</b>
<b>Q.7</b>	Briefly Discuss legal impact of open Source and free Software Licensing giving relevant example highlighting the impact.	<b>10</b>

<b>Seat No.</b>	
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Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.

Marks: 10

10

- Page 7 of 12

- 9) \_\_\_\_\_ is a legal instrument governing the usage or redistribution of the software.
- |                       |                       |
|-----------------------|-----------------------|
| a) GNU Public License | b) Reciprocal License |
| c) Software License   | d) Academic License   |
- 10) Dual licensing is also called as \_\_\_\_\_.
- |                    |                       |
|--------------------|-----------------------|
| a) tri-licensing   | b) business licensing |
| c) multi licensing | d) software licensing |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Licences and Practices**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any four questions from Q.2 to Q.7.  
2) Figures to the right indicates full marks

<b>Attempt any Four (Each carries 10 marks)</b>		<b>40</b>
<b>Q.2</b>	With help of examples explain issues with copyright.	<b>10</b>
<b>Q.3</b>	Briefly explain The self-Enforcing Nature of Open Source and Free Software Licenses.	<b>10</b>
<b>Q.4</b>	Explain in detail Sun Community Source License.	<b>10</b>
<b>Q.5</b>	Explain in detail Multiple and Cross Licensing.	<b>10</b>
<b>Q.6</b>	Explain various types of Software Licenses.	<b>10</b>
<b>Q.7</b>	Briefly Discuss legal impact of open Source and free Software Licensing giving relevant example highlighting the impact.	<b>10</b>

Seat No.	
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Set	S
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Licences and Practices**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.** **10**

- 1) The user must agree to the \_\_\_\_\_ terms and agreements when they use as a open source software.
 

a) System	b) License
c) Community	d) Programmer
- 2) Which of the following is not an open source Software?
 

a) Linux	b) Ubuntu
c) Open Office	d) Windows 10
- 3) Which of the following is a disadvantage of 'proprietary' software?
 

a) You need to be an expert to edit code
b) You have to pay for this type of software
c) Its often free
d) You can edit the source code to customize it
- 4) The open source method for creating software rely on developers who voluntarily revel code in the expectation that other developers will reciprocate is called \_\_\_\_\_.
 

a) open source property	b) intellectual property
c) software property	d) licensing property
- 5) \_\_\_\_\_ is a legal instrument governing the usage or redistribution of the software.
 

a) GNU Public License	b) Reciprocal License
c) Software License	d) Academic License
- 6) Dual licensing is also called as \_\_\_\_\_.
 

a) tri-licensing	b) business licensing
c) multi licensing	d) software licensing
- 7) Microsoft uses and release code under a variety of licenses including \_\_\_\_\_.
 

a) gpl	b) apache
c) ibm	d) gnu project license

- 8)** Richard Stallman from MIT, established a special license, the \_\_\_\_ license.
- |            |               |
|------------|---------------|
| a) GNU     | b) Free       |
| c) Package | d) Commercial |
- 9)** The copyright board shall be deemed to be a \_\_\_\_.
- |                  |                   |
|------------------|-------------------|
| a) Supreme Court | b) High Court     |
| c) Civil Court   | d) Criminal Court |
- 10)** In India first Copyright Act was passed in \_\_\_\_.
- |         |         |
|---------|---------|
| a) 1914 | b) 1709 |
| c) 1911 | d) 1842 |

<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Software Licences and Practices**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any four questions from Q.2 to Q.7.  
2) Figures to the right indicates full marks

<b>Attempt any Four (Each carries 10 marks)</b>		<b>40</b>
<b>Q.2</b>	With help of examples explain issues with copyright.	<b>10</b>
<b>Q.3</b>	Briefly explain The self-Enforcing Nature of Open Source and Free Software Licenses.	<b>10</b>
<b>Q.4</b>	Explain in detail Sun Community Source License.	<b>10</b>
<b>Q.5</b>	Explain in detail Multiple and Cross Licensing.	<b>10</b>
<b>Q.6</b>	Explain various types of Software Licenses.	<b>10</b>
<b>Q.7</b>	Briefly Discuss legal impact of open Source and free Software Licensing giving relevant example highlighting the impact.	<b>10</b>

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Distributed Systems**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In the \_\_\_\_\_ model request-response protocol is described to access services of server machine.  
a) Workstation- Server model      b) Processor pool model  
c) Minicomputer model      d) All
- 2) Almost all networks have an upper bound on the size of data that can be transmitted at a time, this size is known as the \_\_\_\_\_.  
a) Bounded transfer unit      b) Maximum transfer unit  
c) Minimum transfer unit      d) None of the above
- 3) In distributed system each processor has its own \_\_\_\_\_.  
a) local memory      b) Clock  
c) both a and b      d) None of these
- 4) \_\_\_\_\_ is not the issue in the design of distributed operating system.  
a) Scalability      b) Performance  
c) Heterogeneity      d) Resource sharing
- 5) \_\_\_\_\_ provides group communication facility and implements a secure and efficient client server based communication protocol.  
a) VMTP      b) TCP  
c) FLIP      d) None
- 6) The \_\_\_\_\_ handles transmission of messages across the network between client and server.  
a) Server Stub      b) RPC Runtime  
c) Client stub      d) Server
- 7) Workstation server model is popular because it is used for \_\_\_\_\_.  
a) E-mail      b) Editing jobs  
c) Executing small programs      d) all of the above
- 8) Each fragment is sent in a packet that has some control information in addition to the message data, then each packet is known as a \_\_\_\_\_.  
a) MTU      b) Multi datagram  
c) Datagram      d) Segment
- 9) \_\_\_\_\_ is not possible in distributed file system.  
a) File replication      b) Migration  
c) Client interface      d) Remote access





<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Distributed Systems**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All Questions are compulsory.

**Section – I**

**Q.2 Attempt any three of the following.** **12**

- a) Differentiate between the monolithic kernel and microkernel approaches for designing a distributed operating system. Discuss their relative advantages and disadvantages.
- b) Why are distributed operating systems more difficult to design than operating Systems for centralized time-sharing systems?
- c) Explain RPC mechanism with diagram.
- d) Describe what is meant by consistent ordering of messages? What is the mechanism used to implement it?
- e) Discuss the relative advantages and disadvantages of using full file caching and block caching models for the data - caching mechanism of a distributed file system.

**Q.3 Attempt any one of the following.** **08**

- a) What is an idempotent operation? Which of the following operations are idempotent:
  - 1) read\_next\_record (filename)
  - 2) readrecord (filename, recordnumber)
  - 3) append\_record (filename, record)
  - 4) writerecord (filename, after\_record\_n, record)
  - 5) seek (filename, position)
  - 6) add (integer\_1, integer\_2)
  - 7) Increment (variable\_name)
- b) Discuss with an example, how to Keep Track of lost and Out-of-Sequence Packets in Multidatagram messages.

**Q.4 Describe the different types of transparency in distributed systems.** **08**

**Section – II**

**Q.5 Attempt any three of the following.** **12**

- a) Elaborate how mutex variable and conditional variable can be used for an application in which two threads of a process have producer -consumer relationship.
- b) Describe the four data transfer models that may be used in a distributed file system that uses the data caching model for file accessing.

- c) What will happen in a bully algorithm for electing a coordinator when two or more processes almost simultaneously discover that the coordinator has crashed.
- d) Compare message passing and Distributed Shared Memory (DSM).
- e) Explain the architecture of distributed shared memory (DSM).

**Q.6 Attempt any one of the following.**

**08**

- a) Discuss the Implementation issues of DSM.
- b) Explain the architecture and the services of Distributed File System. (DFS).

**Q.7 List and explain the mechanisms for building Distributed File System (DFS).**

**08**

<b>Seat No.</b>	
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- 9) Almost all networks have an upper bound on the size of data that can be transmitted at a time, this size is known as the \_\_\_\_\_.  
a) Bounded transfer unit                      b) Maximum transfer unit  
c) Minimum transfer unit                      d) None of the above
- 10) In distributed system each processor has its own \_\_\_\_\_.  
a) local memory                                  b) clock  
c) both a and b                                  d) None of these
- 11) \_\_\_\_\_ is not the issue in the design of distributed operating system.  
a) Scalability                                      b) Performance  
c) Heterogeneity                                  d) Resource sharing
- 12) \_\_\_\_\_ provides group communication facility and implements a secure and efficient client server based communication protocol.  
a) VMTP    b) TCP  
c) FLIP    d) None
- 13) The \_\_\_\_\_ handles transmission of messages across the network between client and server.  
a) Server Stub                                      b) RPC Runtime  
c) Client stub                                        d) Server
- 14) Workstation server model is popular because it is used for \_\_\_\_\_.  
a) E-mail    b) Editing jobs  
c) Executing small programs                      d) all of the above

<b>Seat No.</b>	
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<b>Set Q</b>
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Distributed Systems**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
2) All Questions are compulsory.

**Section – I**

**Q.2 Attempt any three of the following. 12**

- Differentiate between the monolithic kernel and microkernel approaches for designing a distributed operating system. Discuss their relative advantages and disadvantages.
- Why are distributed operating systems more difficult to design than operating Systems for centralized time-sharing systems?
- Explain RPC mechanism with diagram.
- Describe what is meant by consistent ordering of messages? What is the mechanism used to implement it?
- Discuss the relative advantages and disadvantages of using full file caching and block caching models for the data - caching mechanism of a distributed file system.

**Q.3 Attempt any one of the following. 08**

- What is an idempotent operation? Which of the following operations are idempotent:
  - read\_next\_record (filename)
  - readrecord (filename, recordnumber)
  - append\_record (filename, record)
  - writerecord (filename, after\_record\_n, record)
  - seek (filename, position)
  - add (integer\_1, integer\_2)
  - Increment (variable\_name)
- Discuss with an example, how to Keep Track of lost and Out-of-Sequence Packets in Multidatagram messages.

**Q.4 Describe the different types of transparency in distributed systems. 08**

**Section – II**

**Q.5 Attempt any three of the following. 12**

- Elaborate how mutex variable and conditional variable can be used for an application in which two threads of a process have producer -consumer relationship.
- Describe the four data transfer models that may be used in a distributed file system that uses the data caching model for file accessing.

- c) What will happen in a bully algorithm for electing a coordinator when two or more processes almost simultaneously discover that the coordinator has crashed.
- d) Compare message passing and Distributed Shared Memory (DSM).
- e) Explain the architecture of distributed shared memory (DSM).

**Q.6 Attempt any one of the following.**

**08**

- a) Discuss the Implementation issues of DSM.
- b) Explain the architecture and the services of Distributed File System. (DFS).

**Q.7 List and explain the mechanisms for building Distributed File System (DFS).**

**08**

<b>Seat No.</b>	
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Set	R
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- 9) \_\_\_\_\_ provides group communication facility and implements a secure and efficient client server based communication protocol.
- a) VMTP
  - b) TCP
  - c) FLIP
  - d) None
- 10) The \_\_\_\_\_ handles transmission of messages across the network between client and server.
- a) Server Stub
  - b) RPC Runtime
  - c) Client stub
  - d) Server
- 11) Workstation server model is popular because it is used for \_\_\_\_\_.
- a) E-mail
  - b) Editing jobs
  - c) Executing small programs
  - d) all of the above
- 12) Each fragment is sent in a packet that has some control information in addition to the message data, then each packet is known as a \_\_\_\_\_.
- a) MTU
  - b) Multi datagram
  - c) Datagram
  - d) Segment
- 13) \_\_\_\_\_ is not possible in distributed file system.
- a) File replication
  - b) Migration
  - c) Client interface
  - d) Remote access
- 14) In distributed systems, a logical clock is associated with \_\_\_\_\_.
- a) each instruction
  - b) each process
  - c) each register
  - d) none of the these

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Distributed Systems**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All Questions are compulsory.

**Section – I**

**Q.2 Attempt any three of the following.** **12**

- a) Differentiate between the monolithic kernel and microkernel approaches for designing a distributed operating system. Discuss their relative advantages and disadvantages.
- b) Why are distributed operating systems more difficult to design than operating Systems for centralized time-sharing systems?
- c) Explain RPC mechanism with diagram.
- d) Describe what is meant by consistent ordering of messages? What is the mechanism used to implement it?
- e) Discuss the relative advantages and disadvantages of using full file caching and block caching models for the data - caching mechanism of a distributed file system.

**Q.3 Attempt any one of the following.** **08**

- a) What is an idempotent operation? Which of the following operations are idempotent:
  - 1) read\_next\_record (filename)
  - 2) readrecord (filename, recordnumber)
  - 3) append\_record (filename, record)
  - 4) writerecord (filename, after\_record\_n, record)
  - 5) seek (filename, position)
  - 6) add (integer\_1, integer\_2)
  - 7) Increment (variable\_name)
- b) Discuss with an example, how to Keep Track of lost and Out-of-Sequence Packets in Multidatagram messages.

**Q.4 Describe the different types of transparency in distributed systems.** **08**

**Section – II**

**Q.5 Attempt any three of the following.** **12**

- a) Elaborate how mutex variable and conditional variable can be used for an application in which two threads of a process have producer -consumer relationship.
- b) Describe the four data transfer models that may be used in a distributed file system that uses the data caching model for file accessing.

- c) What will happen in a bully algorithm for electing a coordinator when two or more processes almost simultaneously discover that the coordinator has crashed.
- d) Compare message passing and Distributed Shared Memory (DSM).
- e) Explain the architecture of distributed shared memory (DSM).

**Q.6 Attempt any one of the following.**

**08**

- a) Discuss the Implementation issues of DSM.
- b) Explain the architecture and the services of Distributed File System. (DFS).

**Q.7 List and explain the mechanisms for building Distributed File System (DFS).**

**08**

Seat No.	
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Distributed Systems**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The \_\_\_\_\_ handles transmission of messages across the network between client and server.
 

a) Server Stub	b) RPC Runtime
c) Client stub	d) Server
- 2) Workstation server model is popular because it is used for \_\_\_\_\_.
 

a) E-mail	b) Editing jobs
c) Executing small programs	d) all of the above
- 3) Each fragment is sent in a packet that has some control information in addition to the message data, then each packet is known as a \_\_\_\_\_.
 

a) MTU	b) Multi datagram
c) Datagram	d) Segment
- 4) \_\_\_\_\_ is not possible in distributed file system.
 

a) File replication	b) Migration
c) Client interface	d) Remote access
- 5) In distributed systems, a logical clock is associated with \_\_\_\_\_.
 

a) each instruction	b) each process
c) each register	d) none of the these
- 6) Polling method is used in \_\_\_\_\_.
 

a) Blocking send	b) blocking receive
c) Non-blocking send	d) Non-blocking receive
- 7) The null buffer strategy is suitable for synchronous communication.
 

a) True	b) False
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- 8) The process migration involves \_\_\_\_\_.
 

a) Transfer data by entire file or immediate portion required
b) Transfer the computation rather than data
c) Execute an entire process or part of it on different sites
d) None of the mentioned

- 9) The strongest and the desirable call semantics in RPC is \_\_\_\_\_.  
a) Exactly -once call semantics  
b) Last-one call semantics  
c) Last-of-Many call semantics  
d) At-least -Once call semantics
- 10) In the \_\_\_\_\_ model request -response protocol is described to access services of server machine.  
a) Workstation- Server model                      b) Processor pool model  
c) Minicomputer model                              d) All
- 11) Almost all networks have an upper bound on the size of data that can be transmitted at a time, this size is known as the \_\_\_\_\_.  
a) Bounded transfer unit                              b) Maximum transfer unit  
c) Minimum transfer unit                              d) None of the above
- 12) In distributed system each processor has its own \_\_\_\_\_.  
a) local memory    b) clock  
c) both a and b    d) None of these
- 13) \_\_\_\_\_ is not the issue in the design of distributed operating system.  
a) Scalability    b) Performance  
c) Heterogeneity    d) Resource sharing
- 14) \_\_\_\_\_ provides group communication facility and implements a secure and efficient client server based communication protocol.  
a) VMTP    b) TCP  
c) FLIP    d) None

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Distributed Systems**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
2) All Questions are compulsory.

**Section – I**

**Q.2 Attempt any three of the following.** **12**

- a) Differentiate between the monolithic kernel and microkernel approaches for designing a distributed operating system. Discuss their relative advantages and disadvantages.
- b) Why are distributed operating systems more difficult to design than operating Systems for centralized time-sharing systems?
- c) Explain RPC mechanism with diagram.
- d) Describe what is meant by consistent ordering of messages? What is the mechanism used to implement it?
- e) Discuss the relative advantages and disadvantages of using full file caching and block caching models for the data - caching mechanism of a distributed file system.

**Q.3 Attempt any one of the following.** **08**

- a) What is an idempotent operation? Which of the following operations are idempotent:
  - 1) read\_next\_record (filename)
  - 2) readrecord (filename, recordnumber)
  - 3) append\_record (filename, record)
  - 4) writerecord (filename, after\_record\_n, record)
  - 5) seek (filename, position)
  - 6) add (integer\_1, integer\_2)
  - 7) Increment (variable\_name)
- b) Discuss with an example, how to Keep Track of lost and Out-of-Sequence Packets in Multidatagram messages.

**Q.4 Describe the different types of transparency in distributed systems.** **08**

**Section – II**

**Q.5 Attempt any three of the following.** **12**

- a) Elaborate how mutex variable and conditional variable can be used for an application in which two threads of a process have producer -consumer relationship.
- b) Describe the four data transfer models that may be used in a distributed file system that uses the data caching model for file accessing.

- c) What will happen in a bully algorithm for electing a coordinator when two or more processes almost simultaneously discover that the coordinator has crashed.
- d) Compare message passing and Distributed Shared Memory (DSM).
- e) Explain the architecture of distributed shared memory (DSM).

**Q.6 Attempt any one of the following.**

**08**

- a) Discuss the Implementation issues of DSM.
- b) Explain the architecture and the services of Distributed File System. (DFS).

**Q.7 List and explain the mechanisms for building Distributed File System (DFS).**

**08**

Seat No.	
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Set	P
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**

**COMPUTER SCIENCE & ENGINEERING  
Machine Learning**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Machine Learning enables models to train on data sets before being deployed and continuously adapted as new data is ingested is called as \_\_\_\_\_.
  - a) Offline machine learning model
  - b) Deep Learning model
  - c) Online machine Learning model
  - d) None of these
- 2) On the basis of historical data, we can understand the current reality in the business is called as \_\_\_\_\_.
  - a) Predictive analysis
  - b) Data analytics
  - c) Descriptive analytics
  - d) All
- 3) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text.
  - a) Data mining
  - b) Natural Language Processing
  - c) Statistics
  - d) none
- 4) Supervised learning and unsupervised learning both require at least one \_\_\_\_\_.
  - a) Output attribute
  - b) Input attribute
  - c) Hidden attribute
  - d) none
- 5) \_\_\_\_\_ Technique is used to group the similar types of objects with similar parameter.
  - a) Bayesian
  - b) Clustering
  - c) Association
  - d) none
- 6) Which of following steps are required to apply machine learning technique to support business strategy?
  - a) What is the business problem you are trying to solve
  - b) When are the hidden data resources that you can take advantage
  - c) How can you prepare to get your data
  - d) All



- 7) \_\_\_\_\_ Algorithm is used to remove redundant data, outliers and other no useful data.
- |                |                             |
|----------------|-----------------------------|
| a) Bayesian    | b) Dimensionality reduction |
| c) association | d) clustering               |
- 8) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
- |          |            |
|----------|------------|
| a) scipy | b) numpy   |
| c) none  | d) sklearn |
- 9) The driving force behind optimization in machine learning is the response from a function internal to the algorithm, called the \_\_\_\_\_.
- |                        |                  |
|------------------------|------------------|
| a) Regression          | b) cost function |
| c) logistic regression | d) none          |
- 10) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_\_.
- |                        |                   |
|------------------------|-------------------|
| a) mini-batch learning | b) learning model |
| c) linear regression   | d) none           |
- 11) \_\_\_\_\_ involves buying large amounts of goods or services automatically based on a combination of machine-based transactions, algorithms.
- |                         |                  |
|-------------------------|------------------|
| a) Programmatic trading | b) cost function |
| c) mapping              | d) none          |
- 12) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
- |                  |                 |
|------------------|-----------------|
| a) Connectionism | b) Neuron       |
| c) Deep learning | d) all of above |
- 13) \_\_\_\_\_ is used to overcome the problem of snooping.
- |               |            |
|---------------|------------|
| a) training   | b) testing |
| c) validation | d) none    |
- 14) \_\_\_\_\_ is a phenomenon of observing results that are systematically prejudiced due to faulty assumptions.
- |         |             |
|---------|-------------|
| a) bias | b) variance |
| c) mode | d) none     |

<b>Seat No.</b>	
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**

**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt Any Four. 16**
- a) Define Machine Learning. Explain Lear verging the power of machine learning.
  - b) Explain Different machine Learning Technique.
  - c) Explain application of machine learning.
  - d) Explain tying machine learning methods to outcome.
  - e) Explain the impact of machine learning on application.
- Q.3 Attempt Any One. 06**
- a) Exploring the world of Probabilities.
  - b) Explain Requirement of collaboration in Machine Learning.
- Q.4 Attempt the following. 06**
- Explain Exploring cost function.

**Section – II**

- Q.5 Attempt any Four. 16**
- a) Explain the term avoiding sample bias and Leakage Trap.
  - b) Explain the Discovering the incredible Perceptron.
  - c) Explain Learning curves using cross validation.
  - d) Explain the future of machine learning as case study.
  - e) Explain stacking model.
- Q.6 Attempt Any One. 06**
- a) Explain the application of Machine Learning to Business problem.
  - b) Write a short note on following application of machine learning.
    - 1) classifying images
    - 2) scoring opinions and sentiments
- Q.7 Attempt the following. 06**
- Explain the following term
- a) Training
  - b) Testing
  - c) Validating

Seat No.	
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Set Q
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**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**

**COMPUTER SCIENCE & ENGINEERING  
Machine Learning**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
 

a) scipy	b) numpy
c) none	d) sklearn
- 2) The driving force behind optimization in machine learning is the response from a function internal to the algorithm, called the \_\_\_\_\_.
 

a) Regression	b) cost function
c) logistic regression	d) none
- 3) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_\_.
 

a) mini-batch learning	b) learning model
c) linear regression	d) none
- 4) \_\_\_\_\_ involves buying large amounts of goods or services automatically based on a combination of machine-based transactions, algorithms.
 

a) Programmatic trading	b) cost function
c) mapping	d) none
- 5) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
 

a) Connectionism	b) Neuron
c) Deep learning	d) all of above
- 6) \_\_\_\_\_ is used to overcome the problem of snooping.
 

a) training	b) testing
c) validation	d) none
- 7) \_\_\_\_\_ is a phenomenon of observing results that are systematically prejudiced due to faulty assumptions.
 

a) bias	b) variance
c) mode	d) none

- 8) Machine Learning enables models to train on data sets before being deployed and continuously adapted as new data is ingested is called as \_\_\_\_.
- a) Offline machine learning model
  - b) Deep Learning model
  - c) Online machine Learning model
  - d) None of these
- 9) On the basis of historical data, we can understand the current reality in the business is called as \_\_\_\_.
- a) Predictive analysis
  - b) Data analytics
  - c) Descriptive analytics
  - d) All
- 10) \_\_\_\_ is the ability to train computer to understand both human speech and written text.
- a) Data mining
  - b) Natural Language Processing
  - c) Statistics
  - d) none
- 11) Supervised learning and unsupervised learning both require at least one \_\_\_\_.
- a) Output attribute
  - b) Input attribute
  - c) Hidden attribute
  - d) none
- 12) \_\_\_\_ Technique is used to group the similar types of objects with similar parameter.
- a) Bayesian
  - b) Clustering
  - c) Association
  - d) none
- 13) Which of following steps are required to apply machine learning technique to support business strategy?
- a) What is the business problem you are trying to solve
  - b) When are the hidden data resources that you can take advantage
  - c) How can you prepare to get your data
  - d) All
- 14) \_\_\_\_ Algorithm is used to remove redundant data, outliers and other no useful data.
- a) Bayesian
  - b) Dimensionality reduction
  - c) association
  - d) clustering

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt Any Four. 16**  
 a) Define Machine Learning. Explain Lear verging the power of machine learning.  
 b) Explain Different machine Learning Technique.  
 c) Explain application of machine learning.  
 d) Explain tying machine learning methods to outcome.  
 e) Explain the impact of machine learning on application.
- Q.3 Attempt Any One. 06**  
 a) Exploring the world of Probabilities.  
 b) Explain Requirement of collaboration in Machine Learning.
- Q.4 Attempt the following. 06**  
 Explain Exploring cost function.

**Section – II**

- Q.5 Attempt any Four. 16**  
 a) Explain the term avoiding sample bias and Leakage Trap.  
 b) Explain the Discovering the incredible Perceptron.  
 c) Explain Learning curves using cross validation.  
 d) Explain the future of machine learning as case study.  
 e) Explain stacking model.
- Q.6 Attempt Any One. 06**  
 a) Explain the application of Machine Learning to Business problem.  
 b) Write a short note on following application of machine learning.  
     1) classifying images  
     2) scoring opinions and sentiments
- Q.7 Attempt the following. 06**  
 Explain the following term  
 a) Training  
 b) Testing  
 c) Validating

Seat No.	
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Set **R**

**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**

**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) \_\_\_\_\_ involves buying large amounts of goods or services automatically based on a combination of machine-based transactions, algorithms.
  - a) Programmatic trading
  - b) cost function
  - c) mapping
  - d) none
- 2) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
  - a) Connectionism
  - b) Neuron
  - c) Deep learning
  - d) all of above
- 3) \_\_\_\_\_ is used to overcome the problem of snooping.
  - a) training
  - b) testing
  - c) validation
  - d) none
- 4) \_\_\_\_\_ is a phenomenon of observing results that are systematically prejudiced due to faulty assumptions.
  - a) bias
  - b) variance
  - c) mode
  - d) none
- 5) Machine Learning enables models to train on data sets before being deployed and continuously adapted as new data is ingested is called as \_\_\_\_\_.
  - a) Offline machine learning model
  - b) Deep Learning model
  - c) Online machine Learning model
  - d) None of these
- 6) On the basis of historical data, we can understand the current reality in the business is called as \_\_\_\_\_.
  - a) Predictive analysis
  - b) Data analytics
  - c) Descriptive analytics
  - d) All
- 7) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text.
  - a) Data mining
  - b) Natural Language Processing
  - c) Statistics
  - d) none

- 8) Supervised learning and unsupervised learning both require at least one \_\_\_\_.
- a) Output attribute
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- 9) \_\_\_\_\_ Technique is used to group the similar types of objects with similar parameter.
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  - c) Association
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- 10) Which of following steps are required to apply machine learning technique to support business strategy?
- a) What is the business problem you are trying to solve
  - b) When are the hidden data resources that you can take advantage
  - c) How can you prepare to get your data
  - d) All
- 11) \_\_\_\_\_ Algorithm is used to remove redundant data, outliers and other no useful data.
- a) Bayesian
  - b) Dimensionality reduction
  - c) association
  - d) clustering
- 12) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
- a) scipy
  - b) numpy
  - c) none
  - d) sklearn
- 13) The driving force behind optimization in machine learning is the response from a function internal to the algorithm, called the \_\_\_\_.
- a) Regression
  - b) cost function
  - c) logistic regression
  - d) none
- 14) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_.
- a) mini-batch learning
  - b) learning model
  - c) linear regression
  - d) none

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
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**Section – I**

- Q.2 Attempt Any Four. 16**  
 a) Define Machine Learning. Explain Lear verging the power of machine learning.  
 b) Explain Different machine Learning Technique.  
 c) Explain application of machine learning.  
 d) Explain tying machine learning methods to outcome.  
 e) Explain the impact of machine learning on application.
- Q.3 Attempt Any One. 06**  
 a) Exploring the world of Probabilities.  
 b) Explain Requirement of collaboration in Machine Learning.
- Q.4 Attempt the following. 06**  
 Explain Exploring cost function.

**Section – II**

- Q.5 Attempt any Four. 16**  
 a) Explain the term avoiding sample bias and Leakage Trap.  
 b) Explain the Discovering the incredible Perceptron.  
 c) Explain Learning curves using cross validation.  
 d) Explain the future of machine learning as case study.  
 e) Explain stacking model.
- Q.6 Attempt Any One. 06**  
 a) Explain the application of Machine Learning to Business problem.  
 b) Write a short note on following application of machine learning.  
     1) classifying images  
     2) scoring opinions and sentiments
- Q.7 Attempt the following. 06**  
 Explain the following term  
 a) Training  
 b) Testing  
 c) Validating



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Set **S**

**Fourth Year (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**

**COMPUTER SCIENCE & ENGINEERING  
Machine Learning**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) Which of following steps are required to apply machine learning technique to support business strategy?
  - a) What is the business problem you are trying to solve
  - b) When are the hidden data resources that you can take advantage
  - c) How can you prepare to get your data
  - d) All
- 2) \_\_\_\_\_ Algorithm is used to remove redundant data, outliers and other no useful data.
  - a) Bayesian
  - b) Dimensionality reduction
  - c) association
  - d) clustering
- 3) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
  - a) scipy
  - b) numpy
  - c) none
  - d) sklearn
- 4) The driving force behind optimization in machine learning is the response from a function internal to the algorithm, called the \_\_\_\_\_.
  - a) Regression
  - b) cost function
  - c) logistic regression
  - d) none
- 5) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_\_.
  - a) mini-batch learning
  - b) learning model
  - c) linear regression
  - d) none
- 6) \_\_\_\_\_ involves buying large amounts of goods or services automatically based on a combination of machine-based transactions, algorithms.
  - a) Programmatic trading
  - b) cost function
  - c) mapping
  - d) none
- 7) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
  - a) Connectionism
  - b) Neuron
  - c) Deep learning
  - d) all of above

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 31-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt Any Four. 16**
- a) Define Machine Learning. Explain Lear verging the power of machine learning.
  - b) Explain Different machine Learning Technique.
  - c) Explain application of machine learning.
  - d) Explain tying machine learning methods to outcome.
  - e) Explain the impact of machine learning on application.
- Q.3 Attempt Any One. 06**
- a) Exploring the world of Probabilities.
  - b) Explain Requirement of collaboration in Machine Learning.
- Q.4 Attempt the following. 06**
- Explain Exploring cost function.

**Section – II**

- Q.5 Attempt any Four. 16**
- a) Explain the term avoiding sample bias and Leakage Trap.
  - b) Explain the Discovering the incredible Perceptron.
  - c) Explain Learning curves using cross validation.
  - d) Explain the future of machine learning as case study.
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- Q.6 Attempt Any One. 06**
- a) Explain the application of Machine Learning to Business problem.
  - b) Write a short note on following application of machine learning.
    - 1) classifying images
    - 2) scoring opinions and sentiments
- Q.7 Attempt the following. 06**
- Explain the following term
- a) Training
  - b) Testing
  - c) Validating

Seat No.	
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Set	P
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER ENGINEERING**  
**Modern Database System**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) In Type Inheritance, the keyword \_\_\_\_\_ says that, subtype may not be created, from the given type.
 

a) not final	b) self
c) create	d) final
- 2) Every individual operation in query are parallelized in \_\_\_\_\_.
 

a) Interquery parallelism	b) Interoperation parallelism
c) Intraoperation parallelism	d) none
- 3) The task of correcting and pre-processing the data is called as \_\_\_\_\_.
 

a) data Correction	b) data warehousing
c) Loading	d) Data Cleaning
- 4) \_\_\_\_\_ is an unordered collection, where an element may occur multiple times.
 

a) Array	b) Multiset
c) Create Type	d) Structure Type
- 5) In Quorum Consensus protocol, values for read quorum  $Q_r$  and Write Quorum  $Q_w$  for each data item are chosen as \_\_\_\_\_, where  $S$  is the weight for all sites.
 

a) $Q_r + Q_w > S$ and $2 * Q_w > S$	b) $Q_r + Q_w < S$ and $2 * Q_w > S$
c) $Q_r + Q_w > S$ and $2 * Q_w < S$	d) $Q_r + Q_w < S$ and $2 * Q_w < S$
- 6) \_\_\_\_\_ Partitioning technique is Best suited for Point Queries based on partitioning attributes.
 

a) Range Partitioning	b) Round Robin Partitioning
c) Hash Partitioning	d) All
- 7) For Joins where partitioning is not applicable, parallelism can be accomplished by \_\_\_\_\_ techniques.
 

a) range partitioning sort	b) parallel external sort merge
c) partition parallel join	d) fragment and replicate join
- 8) \_\_\_\_\_ can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
 

a) MapReduce	b) Mahout
c) Oozie	d) All of the mentioned

- 9) Most NoSQL databases support automatic \_\_\_\_\_, meaning that you get high availability and disaster recovery.
- a) processing
  - b) scalability
  - c) replication
  - d) All of the mentioned
- 10) A variation of the star schema that allows more than one central fact table.
- a) Snowflake Schema
  - b) Linked star Schema
  - c) Distributed star Schema
  - d) Constellation Schema
- 11) NoSQL databases is used mainly for handling large volumes of \_\_\_\_\_ data.
- a) unstructured
  - b) structured
  - c) semi-structured
  - d) All of the mentioned
- 12) A global locking system is required in \_\_\_\_\_.
- a) shared disk architecture
  - b) Shared Nothing architecture
  - c) Shared-memory Architecture
  - d) All of these
- 13) \_\_\_\_\_ predicts future trends & behaviour's, allowing business managers to make proactive, knowledge-driven decisions.
- a) Data warehouse
  - b) Data mining
  - c) Data marts
  - d) Metadata
- 14) The type of relationship in star schema is \_\_\_\_\_.
- a) many-to-many
  - b) one-to-one
  - c) one-to-many
  - d) many-to-one

<b>Seat No.</b>	
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER ENGINEERING**  
**Modern Database System**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
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**Section – I**

**Q.2 Answer any four** **16**

- a) List and compare different partitioning techniques.
- b) What are different issues in designing a Data Server?
- c) How deadlock is handled in distributed database systems?
- d) How ranking operation can be performed on database?
- e) List and explain 4 methods of OLAP implementation.

**Q.3 Answer any Two** **12**

- a) Define Data Warehouse and Data Mining? Explain KDD process in Detail.
- b) In Distributed Transaction which protocol is used to ensure Atomicity? Explain the protocol in detail.
- c) Explain Fragment and replicate join and Asymmetric Fragment and Replicate Join.

**Section – II**

**Q.4 Answer any four** **16**

- a) Describe characteristics of MongoDB.
- b) Explain Type inheritance with example.
- c) Differentiate between object-oriented DBMS and Object-relational DBMS.
- d) Explain external Sort merge in detail.
- e) With the help of diagram, explain steps in query processing.

**Q.5 Answer any Two** **12**

- a) Explain Hadoop Distributed File System (HDFS) Architecture with diagram.
- b) In Object oriented database, structured type can have methods. With example, write declaration, body of method and also explain how this method can be invoked on instance of Type.
- c) List Characteristics of NoSql. Also define Key-value store and Document Database.

Seat No.	
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Set Q
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER ENGINEERING**  
**Modern Database System**

Day & Date: Friday, 17-02-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
  - a) MapReduce
  - b) Mahout
  - c) Oozie
  - d) All of the mentioned
- 2) Most NoSQL databases support automatic \_\_\_\_\_, meaning that you get high availability and disaster recovery.
  - a) processing
  - b) scalability
  - c) replication
  - d) All of the mentioned
- 3) A variation of the star schema that allows more than one central fact table.
  - a) Snowflake Schema
  - b) Linked star Schema
  - c) Distributed star Schema
  - d) Constellation Schema
- 4) NoSQL databases is used mainly for handling large volumes of \_\_\_\_\_ data.
  - a) unstructured
  - b) structured
  - c) semi-structured
  - d) All of the mentioned
- 5) A global locking system is required in \_\_\_\_\_.
  - a) shared disk architecture
  - b) Shared Nothing architecture
  - c) Shared-memory Architecture
  - d) All of these
- 6) \_\_\_\_\_ predicts future trends & behaviour's, allowing business managers to make proactive, knowledge-driven decisions.
  - a) Data warehouse
  - b) Data mining
  - c) Data marts
  - d) Metadata
- 7) The type of relationship in star schema is \_\_\_\_\_.
  - a) many-to-many
  - b) one-to-one
  - c) one-to-many
  - d) many-to-one
- 8) In Type Inheritance, the keyword \_\_\_\_\_ says that, subtype may not be created, from the given type.
  - a) not final
  - b) self
  - c) create
  - d) final

- 9) Every individual operation in query are parallelized in \_\_\_\_\_.  
a) Interquery parallelism                      b) Interoperation parallelism  
c) Intraoperation parallelism                d) none
- 10) The task of correcting and pre-processing the data is called as \_\_\_\_\_.  
a) data Correction                                b) data warehousing  
c) Loading    d) Data Cleaning
- 11) \_\_\_\_\_ is an unordered collection, where an element may occur multiple times.  
a) Array    b) Multiset  
c) Create Type                                    d) Structure Type
- 12) In Quorum Consensus protocol, values for read quorum  $Q_r$  and Write Quorum  $Q_w$  for each data item are chosen as \_\_\_\_\_, where  $S$  is the weight for all sites.  
a)  $Q_r + Q_w > S$  and  $2 * Q_w > S$             b)  $Q_r + Q_w < S$  and  $2 * Q_w > S$   
c)  $Q_r + Q_w > S$  and  $2 * Q_w < S$             d)  $Q_r + Q_w < S$  and  $2 * Q_w < S$
- 13) \_\_\_\_\_ Partitioning technique is Best suited for Point Queries based on partitioning attributes.  
a) Range Partitioning                            b) Round Robin Partitioning  
c) Hash Partitioning                              d) All
- 14) For Joins where partitioning is not applicable, parallelism can be accomplished by \_\_\_\_\_ techniques.  
a) range partitioning sort                      b) parallel external sort merge  
c) partition parallel join                        d) fragment and replicate join



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<b>Set Q</b>
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER ENGINEERING**  
**Modern Database System**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any four** **16**

- a) List and compare different partitioning techniques.
- b) What are different issues in designing a Data Server?
- c) How deadlock is handled in distributed database systems?
- d) How ranking operation can be performed on database?
- e) List and explain 4 methods of OLAP implementation.

**Q.3 Answer any Two** **12**

- a) Define Data Warehouse and Data Mining? Explain KDD process in Detail.
- b) In Distributed Transaction which protocol is used to ensure Atomicity? Explain the protocol in detail.
- c) Explain Fragment and replicate join and Asymmetric Fragment and Replicate Join.

**Section – II**

**Q.4 Answer any four** **16**

- a) Describe characteristics of MongoDB.
- b) Explain Type inheritance with example.
- c) Differentiate between object-oriented DBMS and Object-relational DBMS.
- d) Explain external Sort merge in detail.
- e) With the help of diagram, explain steps in query processing.

**Q.5 Answer any Two** **12**

- a) Explain Hadoop Distributed File System (HDFS) Architecture with diagram.
- b) In Object oriented database, structured type can have methods. With example, write declaration, body of method and also explain how this method can be invoked on instance of Type.
- c) List Characteristics of NoSql. Also define Key-value store and Document Database.

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER ENGINEERING**  
**Modern Database System**

Day &amp; Date: Friday, 17-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) NoSQL databases is used mainly for handling large volumes of \_\_\_\_ data.
 

a) unstructured	b) structured
c) semi-structured	d) All of the mentioned
- 2) A global locking system is required in \_\_\_\_\_.
 

a) shared disk architecture	b) Shared Nothing architecture
c) Shared-memory Architecture	d) All of these
- 3) \_\_\_\_\_ predicts future trends & behaviour's, allowing business managers to make proactive, knowledge-driven decisions.
 

a) Data warehouse	b) Data mining
c) Data marts	d) Metadata
- 4) The type of relationship in star schema is \_\_\_\_\_.
 

a) many-to-many	b) one-to-one
c) one-to-many	d) many-to-one
- 5) In Type Inheritance, the keyword \_\_\_\_\_ says that, subtype may not be created, from the given type.
 

a) not final	b) self
c) create	d) final
- 6) Every individual operation in query are parallelized in \_\_\_\_\_.
 

a) Interquery parallelism	b) Interoperation parallelism
c) Intraopration parallelism	d) none
- 7) The task of correcting and pre-processing the data is called as \_\_\_\_\_.
 

a) data Correction	b) data warehousing
c) Loading	d) Data Cleaning
- 8) \_\_\_\_\_ is an unordered collection, where an element may occur multiple times.
 

a) Array	b) Multiset
c) Create Type	d) Structure Type

- 9) In Quorum Consensus protocol, values for read quorum  $Q_r$  and Write Quorum  $Q_w$  for each data item are chosen as \_\_\_\_\_, where  $S$  is the weight for all sites.
- a)  $Q_r + Q_w > S$  and  $2 * Q_w > S$       b)  $Q_r + Q_w < S$  and  $2 * Q_w > S$   
c)  $Q_r + Q_w > S$  and  $2 * Q_w < S$       d)  $Q_r + Q_w < S$  and  $2 * Q_w < S$
- 10) \_\_\_\_\_ Partitioning technique is Best suited for Point Queries based on partitioning attributes.
- a) Range Partitioning      b) Round Robin Partitioning  
c) Hash Partitioning      d) All
- 11) For Joins where partitioning is not applicable, parallelism can be accomplished by \_\_\_\_\_ techniques.
- a) range partitioning sort      b) parallel external sort merge  
c) partition parallel join      d) fragment and replicate join
- 12) \_\_\_\_\_ can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
- a) MapReduce      b) Mahout  
c) Oozie      d) All of the mentioned
- 13) Most NoSQL databases support automatic \_\_\_\_\_, meaning that you get high availability and disaster recovery.
- a) processing      b) scalability  
c) replication      d) All of the mentioned
- 14) A variation of the star schema that allows more than one central fact table.
- a) Snowflake Schema      b) Linked star Schema  
c) Distributed star Schema      d) Constellation Schema

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER ENGINEERING**  
**Modern Database System**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
 2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any four** **16**

- a) List and compare different partitioning techniques.
- b) What are different issues in designing a Data Server?
- c) How deadlock is handled in distributed database systems?
- d) How ranking operation can be performed on database?
- e) List and explain 4 methods of OLAP implementation.

**Q.3 Answer any Two** **12**

- a) Define Data Warehouse and Data Mining? Explain KDD process in Detail.
- b) In Distributed Transaction which protocol is used to ensure Atomicity? Explain the protocol in detail.
- c) Explain Fragment and replicate join and Asymmetric Fragment and Replicate Join.

**Section – II**

**Q.4 Answer any four** **16**

- a) Describe characteristics of MongoDB.
- b) Explain Type inheritance with example.
- c) Differentiate between object-oriented DBMS and Object-relational DBMS.
- d) Explain external Sort merge in detail.
- e) With the help of diagram, explain steps in query processing.

**Q.5 Answer any Two** **12**

- a) Explain Hadoop Distributed File System (HDFS) Architecture with diagram.
- b) In Object oriented database, structured type can have methods. With example, write declaration, body of method and also explain how this method can be invoked on instance of Type.
- c) List Characteristics of NoSql. Also define Key-value store and Document Database.

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Set **S**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER ENGINEERING**  
**Modern Database System**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ Partitioning technique is Best suited for Point Queries based on partitioning attributes.
  - a) Range Partitioning
  - b) Round Robin Partitioning
  - c) Hash Partitioning
  - d) All
- 2) For Joins where partitioning is not applicable, parallelism can be accomplished by \_\_\_\_\_ techniques.
  - a) range partitioning sort
  - b) parallel external sort merge
  - c) partition parallel join
  - d) fragment and replicate join
- 3) \_\_\_\_\_ can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
  - a) MapReduce
  - b) Mahout
  - c) Oozie
  - d) All of the mentioned
- 4) Most NoSQL databases support automatic \_\_\_\_\_, meaning that you get high availability and disaster recovery.
  - a) processing
  - b) scalability
  - c) replication
  - d) All of the mentioned
- 5) A variation of the star schema that allows more than one central fact table.
  - a) Snowflake Schema
  - b) Linked star Schema
  - c) Distributed star Schema
  - d) Constellation Schema
- 6) NoSQL databases is used mainly for handling large volumes of \_\_\_\_\_ data.
  - a) unstructured
  - b) structured
  - c) semi-structured
  - d) All of the mentioned
- 7) A global locking system is required in \_\_\_\_\_.
  - a) shared disk architecture
  - b) Shared Nothing architecture
  - c) Shared-memory Architecture
  - d) All of these
- 8) \_\_\_\_\_ predicts future trends & behaviour's, allowing business managers to make proactive, knowledge-driven decisions.
  - a) Data warehouse
  - b) Data mining
  - c) Data marts
  - d) Metadata



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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER ENGINEERING**  
**Modern Database System**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Answer any four** **16**

- a) List and compare different partitioning techniques.
- b) What are different issues in designing a Data Server?
- c) How deadlock is handled in distributed database systems?
- d) How ranking operation can be performed on database?
- e) List and explain 4 methods of OLAP implementation.

**Q.3 Answer any Two** **12**

- a) Define Data Warehouse and Data Mining? Explain KDD process in Detail.
- b) In Distributed Transaction which protocol is used to ensure Atomicity? Explain the protocol in detail.
- c) Explain Fragment and replicate join and Asymmetric Fragment and Replicate Join.

**Section – II**

**Q.4 Answer any four** **16**

- a) Describe characteristics of MongoDB.
- b) Explain Type inheritance with example.
- c) Differentiate between object-oriented DBMS and Object-relational DBMS.
- d) Explain external Sort merge in detail.
- e) With the help of diagram, explain steps in query processing.

**Q.5 Answer any Two** **12**

- a) Explain Hadoop Distributed File System (HDFS) Architecture with diagram.
- b) In Object oriented database, structured type can have methods. With example, write declaration, body of method and also explain how this method can be invoked on instance of Type.
- c) List Characteristics of NoSql. Also define Key-value store and Document Database.

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What are the key components of a M2M system?
  - a) Vortex DDS
  - b) Smart Homes
  - c) Sensors and Wi-Fi
  - d) Protocols
- 2) Which is not an IoT communication model
  - a) Push-Producer
  - b) Publish-Subscribe
  - c) Request-Response
  - d) Exclusive Pair
- 3) Which of the following is not an application of IoT?
  - a) Wearables
  - b) Smart Grid
  - c) Arduino
  - d) Smart city
- 4) Choose correct principle of IOT \_\_\_\_\_.
  - a) focus on the value
  - b) focus on the machine
  - c) build a strong machine
  - d) neither one
- 5) \_\_\_\_\_ in the IoT Architecture is the hardware and software gateways that analyze and pre-process the data before transferring it to the cloud.
  - a) Data center
  - b) Edge IT
  - c) Gateways
  - d) Data Acquisition
- 6) In which RFID tag, the range is less.
  - a) Active
  - b) Semi-passive
  - c) Passive
  - d) None of the above
- 7) What is another name for I2C?
  - a) Signal wire interface
  - b) Two wire interfaces
  - c) UART
  - d) USART
- 8) Which one of the following protocols is lightweight?
  - a) IP
  - b) HTTP
  - c) MQTT
  - d) CoAP
- 9) Which of the following IEEE standards is followed by the physical and MAC layer protocols in ZigBee?
  - a) IEEE 801.15.4
  - b) IEEE 802.15.4
  - c) IEEE 803.15.4
  - d) IEEE 804.15.4



- 10)** Smart warehousing uses \_\_\_\_\_ based framework.  
a) Both RIFT and RIST                      b) Only RIFT  
c) Only RIST                                      d) Only REST
- 11)** Coordinator ZigBee devices act as the bridge between \_\_\_\_\_.  
a) Different networks                      b) Different edge devices  
c) Different fog devices                      d) All of the above
- 12)** IoT devices can easily lead to catastrophe without \_\_\_\_\_.  
a) Software                                      b) Devices  
c) Cloud    d) Management System
- 13)** What is the role of Big data in smart grid architecture of IoT?  
a) Store data                                      b) Manage Data  
c) Collect data                                      d) Security
- 14)** Smart Fitness clothing mainly has which device?  
a) Battery    b) Bluetooth  
c) Sensors    d) Internet

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**Set****P**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- a) What are the characteristics of IoT?
- b) Write a note on sources of IoT.
- c) Explain automotive IoT.
- d) Write in detail application of Actuator.

**Q.3 Solve any two. 16**

- a) Write in detail physical design of IoT.
- b) Write a note on M2M Communications.
- c) Explain RFID (Radio Frequency Identification Technology's) in detail.

**Section – II**

**Q.4 Solve any three. 12**

- a) Explain IoT privacy & Vulnerability in brief.
- b) Explain business model scenario for IoT.
- c) Write a note on application of IoT in smart agriculture.
- d) Explain the concept of Bluetooth & its low frequency profile in IoT.

**Q.5 Solve any two. 16**

- a) Explain in detail Constrained application protocol.
- b) Write a note on business models in IoT.
- c) Explain application of IoT in smart city.

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- 10) Which of the following is not an application of IoT?
  - a) Wearables
  - b) Smart Grid
  - c) Arduino
  - d) Smart city
- 11) Choose correct principle of IOT \_\_\_\_\_.
  - a) focus on the value
  - b) focus on the machine
  - c) build a strong machine
  - d) neither one
- 12) \_\_\_\_\_ in the IoT Architecture is the hardware and software gateways that analyze and pre-process the data before transferring it to the cloud.
  - a) Data center
  - b) Edge IT
  - c) Gateways
  - d) Data Acquisition
- 13) In which RFID tag, the range is less.
  - a) Active
  - b) Semi-passive
  - c) Passive
  - d) None of the above
- 14) What is another name for I2C?
  - a) Signal wire interface
  - b) Two wire interfaces
  - c) UART
  - d) USART

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Solve any three of the following questions. 12**
- a) What are the characteristics of IoT?
  - b) Write a note on sources of IoT.
  - c) Explain automotive IoT.
  - d) Write in detail application of Actuator.
- Q.3 Solve any two. 16**
- a) Write in detail physical design of IoT.
  - b) Write a note on M2M Communications.
  - c) Explain RFID (Radio Frequency Identification Technology's) in detail.

**Section – II**

- Q.4 Solve any three. 12**
- a) Explain IoT privacy & Vulnerability in brief.
  - b) Explain business model scenario for IoT.
  - c) Write a note on application of IoT in smart agriculture.
  - d) Explain the concept of Bluetooth & its low frequency profile in IoT.
- Q.5 Solve any two. 16**
- a) Explain in detail Constrained application protocol.
  - b) Write a note on business models in IoT.
  - c) Explain application of IoT in smart city.

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Coordinator ZigBee devices act as the bridge between \_\_\_\_\_.  
 a) Different networks                      b) Different edge devices  
 c) Different fog devices                      d) All of the above
- 2) IoT devices can easily lead to catastrophe without \_\_\_\_\_.  
 a) Software                      b) Devices  
 c) Cloud                      d) Management System
- 3) What is the role of Big data in smart grid architecture of IoT?  
 a) Store data                      b) Manage Data  
 c) Collect data                      d) Security
- 4) Smart Fitness clothing mainly has which device?  
 a) Battery                      b) Bluetooth  
 c) Sensors                      d) Internet
- 5) What are the key components of a M2M system?  
 a) Vortex DDS                      b) Smart Homes  
 c) Sensors and Wi-Fi                      d) Protocols
- 6) Which is not an IoT communication model  
 a) Push-Producer                      b) Publish-Subscribe  
 c) Request-Response                      d) Exclusive Pair
- 7) Which of the following is not an application of IoT?  
 a) Wearables                      b) Smart Grid  
 c) Arduino                      d) Smart city
- 8) Choose correct principle of IOT \_\_\_\_\_.  
 a) focus on the value                      b) focus on the machine  
 c) build a strong machine                      d) neither one
- 9) \_\_\_\_\_ in the IoT Architecture is the hardware and software gateways that analyze and pre-process the data before transferring it to the cloud.  
 a) Data center                      b) Edge IT  
 c) Gateways                      d) Data Acquisition

- 10)** In which RFID tag, the range is less.
- |            |                      |
|------------|----------------------|
| a) Active  | b) Semi-passive      |
| c) Passive | d) None of the above |
- 11)** What is another name for I2C?
- |                          |                        |
|--------------------------|------------------------|
| a) Signal wire interface | b) Two wire interfaces |
| c) UART                  | d) USART               |
- 12)** Which one of the following protocols is lightweight?
- |         |         |
|---------|---------|
| a) IP   | b) HTTP |
| c) MQTT | d) CoAP |
- 13)** Which of the following IEEE standards is followed by the physical and MAC layer protocols in ZigBee?
- |                  |                  |
|------------------|------------------|
| a) IEEE 801.15.4 | b) IEEE 802.15.4 |
| c) IEEE 803.15.4 | d) IEEE 804.15.4 |
- 14)** Smart warehousing uses \_\_\_\_\_ based framework.
- |                       |              |
|-----------------------|--------------|
| a) Both RIFT and RIST | b) Only RIFT |
| c) Only RIST          | d) Only REST |

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Solve any three of the following questions. 12**
- a) What are the characteristics of IoT?
  - b) Write a note on sources of IoT.
  - c) Explain automotive IoT.
  - d) Write in detail application of Actuator.
- Q.3 Solve any two. 16**
- a) Write in detail physical design of IoT.
  - b) Write a note on M2M Communications.
  - c) Explain RFID (Radio Frequency Identification Technology's) in detail.

**Section – II**

- Q.4 Solve any three. 12**
- a) Explain IoT privacy & Vulnerability in brief.
  - b) Explain business model scenario for IoT.
  - c) Write a note on application of IoT in smart agriculture.
  - d) Explain the concept of Bluetooth & its low frequency profile in IoT.
- Q.5 Solve any two. 16**
- a) Explain in detail Constrained application protocol.
  - b) Write a note on business models in IoT.
  - c) Explain application of IoT in smart city.



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In which RFID tag, the range is less.
  - a) Active
  - b) Semi-passive
  - c) Passive
  - d) None of the above
- 2) What is another name for I2C?
  - a) Signal wire interface
  - b) Two wire interfaces
  - c) UART
  - d) USART
- 3) Which one of the following protocols is lightweight?
  - a) IP
  - b) HTTP
  - c) MQTT
  - d) CoAP
- 4) Which of the following IEEE standards is followed by the physical and MAC layer protocols in ZigBee?
  - a) IEEE 801.15.4
  - b) IEEE 802.15.4
  - c) IEEE 803.15.4
  - d) IEEE 804.15.4
- 5) Smart warehousing uses \_\_\_\_\_ based framework.
  - a) Both RIFT and RIST
  - b) Only RIFT
  - c) Only RIST
  - d) Only REST
- 6) Coordinator ZigBee devices act as the bridge between \_\_\_\_\_.
  - a) Different networks
  - b) Different edge devices
  - c) Different fog devices
  - d) All of the above
- 7) IoT devices can easily lead to catastrophe without \_\_\_\_\_.
  - a) Software
  - b) Devices
  - c) Cloud
  - d) Management System
- 8) What is the role of Big data in smart grid architecture of IoT?
  - a) Store data
  - b) Manage Data
  - c) Collect data
  - d) Security

- 9) Smart Fitness clothing mainly has which device?  
a) Battery  
b) Bluetooth  
c) Sensors  
d) Internet
- 10) What are the key components of a M2M system?  
a) Vortex DDS  
b) Smart Homes  
c) Sensors and Wi-Fi  
d) Protocols
- 11) Which is not an IoT communication model  
a) Push-Producer  
b) Publish-Subscribe  
c) Request-Response  
d) Exclusive Pair
- 12) Which of the following is not an application of IoT?  
a) Wearables  
b) Smart Grid  
c) Arduino  
d) Smart city
- 13) Choose correct principle of IOT \_\_\_\_\_.  
a) focus on the value  
b) focus on the machine  
c) build a strong machine  
d) neither one
- 14) \_\_\_\_\_ in the IoT Architecture is the hardware and software gateways that analyze and pre-process the data before transferring it to the cloud.  
a) Data center  
b) Edge IT  
c) Gateways  
d) Data Acquisition

<b>Seat No.</b>	
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**Set S**

**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Internet of Things**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Solve any three of the following questions. 12**
- a) What are the characteristics of IoT?
  - b) Write a note on sources of IoT.
  - c) Explain automotive IoT.
  - d) Write in detail application of Actuator.
- Q.3 Solve any two. 16**
- a) Write in detail physical design of IoT.
  - b) Write a note on M2M Communications.
  - c) Explain RFID (Radio Frequency Identification Technology's) in detail.

**Section – II**

- Q.4 Solve any three. 12**
- a) Explain IoT privacy & Vulnerability in brief.
  - b) Explain business model scenario for IoT.
  - c) Write a note on application of IoT in smart agriculture.
  - d) Explain the concept of Bluetooth & its low frequency profile in IoT.
- Q.5 Solve any two. 16**
- a) Explain in detail Constrained application protocol.
  - b) Write a note on business models in IoT.
  - c) Explain application of IoT in smart city.

Seat No.	
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Set	P
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**Fourth Year. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Solve Multiple Choice Questions.**

**14**

- 1) Test cases should uncover errors like
  - a) Nonexistent loop termination
  - b) Comparison of different data types
  - c) Incorrect logical operators or precedence
  - d) All of these
- 2) The object of \_\_\_\_\_ within an OO system is to design tests that have a high likelihood of uncovering plausible bugs.
  - a) Fault-based testing
  - b) Integration testing
  - c) Use-based testing
  - d) Scenario-based testing
- 3) Which testing tool is responsible for documenting programs?
  - a) Test/File Generator
  - b) Test Harness System
  - c) Test Archiving Systems
  - d) Coverage Analyzer
- 4) Which of the following testing tools examine program systematically & automatically?
  - a) Code Inspector
  - b) Static Analyzer
  - c) Standard Enforcer
  - d) Coverage Analyzer
- 5) Name an evaluation technique to assess the quality of test cases.
  - a) Mutation analysis
  - b) Validation
  - c) Verification
  - d) Performance analysis
- 6) Which of the following is not a conflict in software development team?
  - a) Simultaneous updates
  - b) Shared and common code
  - c) Versions
  - d) Graphics issues
- 7) Quality also can be looked at in terms of user satisfaction which includes
  - a) A compliant product
  - b) Good quality output
  - c) Delivery within budget and schedule
  - d) All of these
- 8) A testing strategy that test the application as a whole.
  - a) Requirement Gathering
  - b) Verification testing
  - c) Validation testing
  - d) System testing

- 9) A set of activities that ensure that software correctly implements a specific function.
- |                   |               |
|-------------------|---------------|
| a) verification   | b) testing    |
| c) implementation | d) validation |
- 10) Which granularity level of testing checks the behaviour of module cooperation?
- |                       |                        |
|-----------------------|------------------------|
| a) Unit Testing       | b) Integration Testing |
| c) Acceptance Testing | d) Regression Testing  |
- 11) Acceptance & system test planning are a part of architectural design.
- |         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|
- 12) Lower and upper limits are present in which chart?
- |                  |                  |
|------------------|------------------|
| a) Run chart     | b) Bar chart     |
| c) Control chart | d) None of these |
- 13) Which of the following is/are White box technique?
- |                       |                     |
|-----------------------|---------------------|
| a) Statement Testing  | b) Decision Testing |
| c) Condition Coverage | d) All of these     |
- 14) Which of the following is non-functional testing?
- |                      |                        |
|----------------------|------------------------|
| a) Black box testing | b) Performance testing |
| c) Unit testing      | d) None of these       |

<b>Seat No.</b>	
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**Fourth Year. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
4) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any Three** **12**
- a) Explain the testing process with attitude towards testing with example.
  - b) What is software testing? Explain with basics of software testing.
  - c) Explain the verification and validation model.
  - d) Explain with example levels of testing.
- Q.3 Attempt any one** **08**
- a) State and explain with example all the challenges of testing also explain test team approach.
- OR**
- b) Explain with Regression Testing, Smoke Testing, Sanity Testing, Ad hoc Testing.
- Q.4 Write note on** **08**
- a) Defect management Process
  - b) Big-Bang and Sandwich Testing

**Section – II**

- Q.5 Solve any three** **12**
- a) Explain the software quality assurance background issues.
  - b) State and explain the Reporting Bugs, Isolating and Reproducing Bugs.
  - c) Explain the statistical of test case organization and tracking.
  - d) State and explain the benefits of automation and tools.
- Q.6 Attempt any one** **08**
- a) Write ten test cases and justify for the case study of forms with various fields.
  - b) Explain with example elements of ISO 900 and CMM standards.
- Q.7 Write note on** **08**
- a) Realities of Using Test Tools and Automation
  - b) SQA Processes and Product Characteristics

Seat No.	
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Set Q
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**Fourth Year. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Solve Multiple Choice Questions.**

**14**

- 1) A testing strategy that test the application as a whole.
  - a) Requirement Gathering
  - b) Verification testing
  - c) Validation testing
  - d) System testing
- 2) A set of activities that ensure that software correctly implements a specific function.
  - a) verification
  - b) testing
  - c) implementation
  - d) validation
- 3) Which granularity level of testing checks the behaviour of module cooperation?
  - a) Unit Testing
  - b) Integration Testing
  - c) Acceptance Testing
  - d) Regression Testing
- 4) Acceptance & system test planning are a part of architectural design.
  - a) True
  - b) False
- 5) Lower and upper limits are present in which chart?
  - a) Run chart
  - b) Bar chart
  - c) Control chart
  - d) None of these
- 6) Which of the following is/are White box technique?
  - a) Statement Testing
  - b) Decision Testing
  - c) Condition Coverage
  - d) All of these
- 7) Which of the following is non-functional testing?
  - a) Black box testing
  - b) Performance testing
  - c) Unit testing
  - d) None of these
- 8) Test cases should uncover errors like
  - a) Nonexistent loop termination
  - b) Comparison of different data types
  - c) Incorrect logical operators or precedence
  - d) All of these
- 9) The object of \_\_\_\_\_ within an OO system is to design tests that have a high likelihood of uncovering plausible bugs.
  - a) Fault-based testing
  - b) Integration testing
  - c) Use-based testing
  - d) Scenario-based testing

- 10)** Which testing tool is responsible for documenting programs?  
a) Test/File Generator                      b) Test Harness System  
c) Test Archiving Systems                d) Coverage Analyzer
- 11)** Which of the following testing tools examine program systematically & automatically?  
a) Code Inspector                              b) Static Analyzer  
c) Standard Enforcer                        d) Coverage Analyzer
- 12)** Name an evaluation technique to assess the quality of test cases.  
a) Mutation analysis                          b) Validation  
c) Verification                                 d) Performance analysis
- 13)** Which of the following is not a conflict in software development team?  
a) Simultaneous updates                    b) Shared and common code  
c) Versions                                      d) Graphics issues
- 14)** Quality also can be looked at in terms of user satisfaction which includes  
a) A compliant product                      b) Good quality output  
c) Delivery within budget and              d) All of these  
    schedule



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**Fourth Year. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 4) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any Three** **12**
- Explain the testing process with attitude towards testing with example.
  - What is software testing? Explain with basics of software testing.
  - Explain the verification and validation model.
  - Explain with example levels of testing.

- Q.3 Attempt any one** **08**
- State and explain with example all the challenges of testing also explain test team approach.

**OR**

- Explain with Regression Testing, Smoke Testing, Sanity Testing, Ad hoc Testing.

- Q.4 Write note on** **08**
- Defect management Process
  - Big-Bang and Sandwich Testing

**Section – II**

- Q.5 Solve any three** **12**
- Explain the software quality assurance background issues.
  - State and explain the Reporting Bugs, Isolating and Reproducing Bugs.
  - Explain the statistical of test case organization and tracking.
  - State and explain the benefits of automation and tools.

- Q.6 Attempt any one** **08**
- Write ten test cases and justify for the case study of forms with various fields.
  - Explain with example elements of ISO 900 and CMM standards.

- Q.7 Write note on** **08**
- Realities of Using Test Tools and Automation
  - SQA Processes and Product Characteristics

<b>Seat No.</b>	
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- 10)** Which of the following is not a conflict in software development team?
- a) Simultaneous updates
  - b) Shared and common code
  - c) Versions
  - d) Graphics issues
- 11)** Quality also can be looked at in terms of user satisfaction which includes
- a) A compliant product
  - b) Good quality output
  - c) Delivery within budget and schedule
  - d) All of these
- 12)** A testing strategy that test the application as a whole.
- a) Requirement Gathering
  - b) Verification testing
  - c) Validation testing
  - d) System testing
- 13)** A set of activities that ensure that software correctly implements a specific function.
- a) verification
  - b) testing
  - c) implementation
  - d) validation
- 14)** Which granularity level of testing checks the behaviour of module cooperation?
- a) Unit Testing
  - b) Integration Testing
  - c) Acceptance Testing
  - d) Regression Testing

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**Fourth Year. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
4) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any Three** **12**
- a) Explain the testing process with attitude towards testing with example.
  - b) What is software testing? Explain with basics of software testing.
  - c) Explain the verification and validation model.
  - d) Explain with example levels of testing.
- Q.3 Attempt any one** **08**
- a) State and explain with example all the challenges of testing also explain test team approach.
- OR**
- b) Explain with Regression Testing, Smoke Testing, Sanity Testing, Ad hoc Testing.
- Q.4 Write note on** **08**
- a) Defect management Process
  - b) Big-Bang and Sandwich Testing

**Section – II**

- Q.5 Solve any three** **12**
- a) Explain the software quality assurance background issues.
  - b) State and explain the Reporting Bugs, Isolating and Reproducing Bugs.
  - c) Explain the statistical of test case organization and tracking.
  - d) State and explain the benefits of automation and tools.
- Q.6 Attempt any one** **08**
- a) Write ten test cases and justify for the case study of forms with various fields.
  - b) Explain with example elements of ISO 900 and CMM standards.
- Q.7 Write note on** **08**
- a) Realities of Using Test Tools and Automation
  - b) SQA Processes and Product Characteristics

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**Fourth Year. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Solve Multiple Choice Questions.**

**14**

- 1) Which of the following is not a conflict in software development team?
 

a) Simultaneous updates	b) Shared and common code
c) Versions	d) Graphics issues
- 2) Quality also can be looked at in terms of user satisfaction which includes
 

a) A compliant product	b) Good quality output
c) Delivery within budget and schedule	d) All of these
- 3) A testing strategy that test the application as a whole.
 

a) Requirement Gathering	b) Verification testing
c) Validation testing	d) System testing
- 4) A set of activities that ensure that software correctly implements a specific function.
 

a) verification	b) testing
c) implementation	d) validation
- 5) Which granularity level of testing checks the behaviour of module cooperation?
 

a) Unit Testing	b) Integration Testing
c) Acceptance Testing	d) Regression Testing
- 6) Acceptance & system test planning are a part of architectural design.
 

a) True	b) False
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- 7) Lower and upper limits are present in which chart?
 

a) Run chart	b) Bar chart
c) Control chart	d) None of these
- 8) Which of the following is/are White box technique?
 

a) Statement Testing	b) Decision Testing
c) Condition Coverage	d) All of these
- 9) Which of the following is non-functional testing?
 

a) Black box testing	b) Performance testing
c) Unit testing	d) None of these

- 10)** Test cases should uncover errors like
- a) Nonexistent loop termination
  - b) Comparison of different data types
  - c) Incorrect logical operators or precedence
  - d) All of these
- 11)** The object of \_\_\_\_\_ within an OO system is to design tests that have a high likelihood of uncovering plausible bugs.
- a) Fault-based testing
  - b) Integration testing
  - c) Use-based testing
  - d) Scenario-based testing
- 12)** Which testing tool is responsible for documenting programs?
- a) Test/File Generator
  - b) Test Harness System
  - c) Test Archiving Systems
  - d) Coverage Analyzer
- 13)** Which of the following testing tools examine program systematically & automatically?
- a) Code Inspector
  - b) Static Analyzer
  - c) Standard Enforcer
  - d) Coverage Analyzer
- 14)** Name an evaluation technique to assess the quality of test cases.
- a) Mutation analysis
  - b) Validation
  - c) Verification
  - d) Performance analysis

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**Fourth Year. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
4) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any Three** **12**
- a) Explain the testing process with attitude towards testing with example.
  - b) What is software testing? Explain with basics of software testing.
  - c) Explain the verification and validation model.
  - d) Explain with example levels of testing.
- Q.3 Attempt any one** **08**
- a) State and explain with example all the challenges of testing also explain test team approach.
- OR**
- b) Explain with Regression Testing, Smoke Testing, Sanity Testing, Ad hoc Testing.
- Q.4 Write note on** **08**
- a) Defect management Process
  - b) Big-Bang and Sandwich Testing

**Section – II**

- Q.5 Solve any three** **12**
- a) Explain the software quality assurance background issues.
  - b) State and explain the Reporting Bugs, Isolating and Reproducing Bugs.
  - c) Explain the statistical of test case organization and tracking.
  - d) State and explain the benefits of automation and tools.
- Q.6 Attempt any one** **08**
- a) Write ten test cases and justify for the case study of forms with various fields.
  - b) Explain with example elements of ISO 900 and CMM standards.
- Q.7 Write note on** **08**
- a) Realities of Using Test Tools and Automation
  - b) SQA Processes and Product Characteristics

Seat No.	
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**Fourth Year (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Business Intelligence**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options:**

**14**

- 1) A decision\_\_\_\_\_ is if it is based on well-defined and recurring decision-making procedure.
 

a) Structured Decisions	b) Unstructured Decisions
c) Semi-structured decisions	d) None of the mentioned
- 2) \_\_\_\_\_ type of decisions affects the entire organization or at least a substantial part of it for a long period of time.
 

a) Tactical decisions	b) Strategic decisions
c) Operational decisions	d) Structured decisions
- 3) Independent variable in regression analysis is also known as \_\_\_\_\_.
 

a) Predictor variable	b) Target variable
c) Outliers	d) None of the mentioned
- 4) Which of the following is/are Benefits of Dimensional Modelling?
 

a) Faster Data Retrieval	b) Better Understandability
c) Extensibility	d) All of the mentioned
- 5) Due to normalization in the Snowflake schema, the redundancy is reduced and therefore, it becomes easy to maintain and save the storage space. (State True/False)
 

a) True	b) False
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- 6) \_\_\_\_\_ is the last step in decision-making process?
 

a) Intelligence	b) Design
c) Choice	d) Control
- 7) DSS refers to \_\_\_\_\_.
 

a) Decision Designing System	b) Decision Support System
c) Declaration Support System	d) Decision Supply System
- 8) Which of the following techniques is/are adapted to improve the quality of incomplete data?
 

a) Elimination	b) Inspection
c) Identification	d) All of the above



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Set	P
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**Fourth Year (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Business Intelligence**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Three (each carries 4 marks):** **12**

- a) How Data mining process provide useful knowledge to decision makers? Explain with neat diagram.
- b) Define Decision system. Describe the phases of Decision-making process in detail.
- c) What do you mean by Ethics on BI?
- d) Differentiate between fact table and dimension table.

**Q.3 Attempt any Two (each carries 8 marks):** **16**

- a) Draw architecture of business intelligence system and explain its components.
- b) What do you mean by data validation? Explain techniques used for data validation.
- c) Design Dimension Models for “Web page clicking event” using Star constellation schema

**Section – II**

**Q.4 Attempt any Three (each carries 4 marks):** **12**

- a) Describe the purpose of Market basket analysis.
- b) Define Time series. How evaluation and analysis of time series take place?
- c) Compare Bivariate and multivariate analysis.
- d) Write a short note on Web-mining.

**Q.5 Attempt any Two (each carries 8 marks):** **16**

- a) Describe the purpose of Regression models and explain linear and logistic regression in detail.
- b) Elaborate the classification tree with suitable example.
- c) What are the motivation and objectives for the spread of relational marketing strategies?

Seat No.	
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Set	Q
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**Fourth Year (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Business Intelligence**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options:**

**14**

- 1) Which of the following techniques is/are adapted to improve the quality of incomplete data?
  - a) Elimination
  - b) Inspection
  - c) Identification
  - d) All of the above
- 2) In Univariate analysis data can be display using Frequency distribution table. (State True/False)
  - a) True
  - b) False
- 3) In which type of variable, changing the order of the unit does not change their values.
  - a) Nominal
  - b) Ordinal
  - c) Predictor
  - d) Target
- 4) Web mining method is used for \_\_\_\_\_.
  - a) Content mining
  - b) Structure mining
  - c) Usage mining
  - d) All of the above
- 5) Business Intelligence and data warehousing is used for \_\_\_\_\_.
  - a) Forecasting
  - b) Data Mining
  - c) Analysis of large volumes of product sales data
  - d) All of the above.
- 6) \_\_\_\_\_ describes the data contained in the data warehouse.
  - a) Relational data
  - b) Operational data
  - c) Metadata
  - d) Informational data
- 7) modelling is used for the design of the data warehouse.
  - a) Relational model
  - b) Object-oriented model
  - c) Dimensional model
  - d) None of the above

- 8) A decision\_\_\_\_\_ is if it is based on well-defined and recurring decision-making procedure.
- a) Structured Decisions                      b) Unstructured Decisions  
c) Semi-structured decisions                d) None of the mentioned
- 9) \_\_\_\_\_ type of decisions affects the entire organization or at least a substantial part of it for a long period of time.
- a) Tactical decisions                          b) Strategic decisions  
c) Operational decisions                      d) Structured decisions
- 10) Independent variable in regression analysis is also known as \_\_\_\_\_.  
a) Predictor variable                          b) Target variable  
c) Outliers                                      d) None of the mentioned
- 11) Which of the following is/are Benefits of Dimensional Modelling?  
a) Faster Data Retrieval                      b) Better Understandability  
c) Extensibility                                 d) All of the mentioned
- 12) Due to normalization in the Snowflake schema, the redundancy is reduced and therefore, it becomes easy to maintain and save the storage space. (State True/False)  
a) True    b) False
- 13) \_\_\_\_\_ is the last step in decision-making process?  
a) Intelligence                                  b) Design  
c) Choice    d) Control
- 14) DSS refers to\_\_\_\_\_.  
a) Decision Designing System                b) Decision Support System  
c) Declaration Support System                d) Decision Supply System

<b>Seat No.</b>	
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<b>Set Q</b>
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**Fourth Year (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Business Intelligence**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Three (each carries 4 marks):** **12**

- a) How Data mining process provide useful knowledge to decision makers? Explain with neat diagram.
- b) Define Decision system. Describe the phases of Decision-making process in detail.
- c) What do you mean by Ethics on BI?
- d) Differentiate between fact table and dimension table.

**Q.3 Attempt any Two (each carries 8 marks):** **16**

- a) Draw architecture of business intelligence system and explain its components.
- b) What do you mean by data validation? Explain techniques used for data validation.
- c) Design Dimension Models for “Web page clicking event” using Star constellation schema

**Section – II**

**Q.4 Attempt any Three (each carries 4 marks):** **12**

- a) Describe the purpose of Market basket analysis.
- b) Define Time series. How evaluation and analysis of time series take place?
- c) Compare Bivariate and multivariate analysis.
- d) Write a short note on Web-mining.

**Q.5 Attempt any Two (each carries 8 marks):** **16**

- a) Describe the purpose of Regression models and explain linear and logistic regression in detail.
- b) Elaborate the classification tree with suitable example.
- c) What are the motivation and objectives for the spread of relational marketing strategies?

<b>Seat No.</b>	
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- 8) Which of the following is/are Benefits of Dimensional Modelling?  
a) Faster Data Retrieval                      b) Better Understandability  
c) Extensibility                                  d) All of the mentioned
- 9) Due to normalization in the Snowflake schema, the redundancy is reduced and therefore, it becomes easy to maintain and save the storage space. (State True/False)  
a) True    b) False
- 10) \_\_\_\_\_ is the last step in decision-making process?  
a) Intelligence                                  b) Design  
c) Choice                                         d) Control
- 11) DSS refers to\_\_\_\_\_.  
a) Decision Designing System              b) Decision Support System  
c) Declaration Support System              d) Decision Supply System
- 12) Which of the following techniques is/are adapted to improve the quality of incomplete data?  
a) Elimination                                  b) Inspection  
c) Identification                                 d) All of the above
- 13) In Univariate analysis data can be display using Frequency distribution table. (State True/False)  
a) True    b) False
- 14) In which type of variable, changing the order of the unit does not change their values.  
a) Nominal                                        b) Ordinal  
c) Predictor                                       d) Target

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<b>Set</b>	<b>R</b>
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**Fourth Year (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Business Intelligence**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Three (each carries 4 marks):** **12**

- a) How Data mining process provide useful knowledge to decision makers? Explain with neat diagram.
- b) Define Decision system. Describe the phases of Decision-making process in detail.
- c) What do you mean by Ethics on BI?
- d) Differentiate between fact table and dimension table.

**Q.3 Attempt any Two (each carries 8 marks):** **16**

- a) Draw architecture of business intelligence system and explain its components.
- b) What do you mean by data validation? Explain techniques used for data validation.
- c) Design Dimension Models for “Web page clicking event” using Star constellation schema

**Section – II**

**Q.4 Attempt any Three (each carries 4 marks):** **12**

- a) Describe the purpose of Market basket analysis.
- b) Define Time series. How evaluation and analysis of time series take place?
- c) Compare Bivariate and multivariate analysis.
- d) Write a short note on Web-mining.

**Q.5 Attempt any Two (each carries 8 marks):** **16**

- a) Describe the purpose of Regression models and explain linear and logistic regression in detail.
- b) Elaborate the classification tree with suitable example.
- c) What are the motivation and objectives for the spread of relational marketing strategies?



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**Fourth Year (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Business Intelligence**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options:**

**14**

- 1) \_\_\_\_\_ is the last step in decision-making process?
 

a) Intelligence	b) Design
c) Choice	d) Control
- 2) DSS refers to \_\_\_\_\_.
 

a) Decision Designing System	b) Decision Support System
c) Declaration Support System	d) Decision Supply System
- 3) Which of the following techniques is/are adapted to improve the quality of incomplete data?
 

a) Elimination	b) Inspection
c) Identification	d) All of the above
- 4) In Univariate analysis data can be display using Frequency distribution table. (State True/False)
 

a) True	b) False
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- 5) In which type of variable, changing the order of the unit does not change their values.
 

a) Nominal	b) Ordinal
c) Predictor	d) Target
- 6) Web mining method is used for \_\_\_\_\_.
 

a) Content mining	b) Structure mining
c) Usage mining	d) All of the above
- 7) Business Intelligence and data warehousing is used for \_\_\_\_\_.
 

a) Forecasting	b) Data Mining
c) Analysis of large volumes of product sales data	d) All of the above.
- 8) \_\_\_\_\_ describes the data contained in the data warehouse.
 

a) Relational data	b) Operational data
c) Metadata	d) Informational data

- 9) modelling is used for the design of the data warehouse.
- a) Relational model
  - b) Object-oriented model
  - c) Dimensional model
  - d) None of the above
- 10) A decision\_\_\_\_\_ is if it is based on well-defined and recurring decision-making procedure.
- a) Structured Decisions
  - b) Unstructured Decisions
  - c) Semi-structured decisions
  - d) None of the mentioned
- 11) \_\_\_\_\_ type of decisions affects the entire organization or at least a substantial part of it for a long period of time.
- a) Tactical decisions
  - b) Strategic decisions
  - c) Operational decisions
  - d) Structured decisions
- 12) Independent variable in regression analysis is also known as \_\_\_\_\_.
- a) Predictor variable
  - b) Target variable
  - c) Outliers
  - d) None of the mentioned
- 13) Which of the following is/are Benefits of Dimensional Modelling?
- a) Faster Data Retrieval
  - b) Better Understandability
  - c) Extensibility
  - d) All of the mentioned
- 14) Due to normalization in the Snowflake schema, the redundancy is reduced and therefore, it becomes easy to maintain and save the storage space. (State True/False)
- a) True
  - b) False

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**Fourth Year (B.Tech.) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Business Intelligence**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Three (each carries 4 marks):** **12**

- a) How Data mining process provide useful knowledge to decision makers? Explain with neat diagram.
- b) Define Decision system. Describe the phases of Decision-making process in detail.
- c) What do you mean by Ethics on BI?
- d) Differentiate between fact table and dimension table.

**Q.3 Attempt any Two (each carries 8 marks):** **16**

- a) Draw architecture of business intelligence system and explain its components.
- b) What do you mean by data validation? Explain techniques used for data validation.
- c) Design Dimension Models for “Web page clicking event” using Star constellation schema

**Section – II**

**Q.4 Attempt any Three (each carries 4 marks):** **12**

- a) Describe the purpose of Market basket analysis.
- b) Define Time series. How evaluation and analysis of time series take place?
- c) Compare Bivariate and multivariate analysis.
- d) Write a short note on Web-mining.

**Q.5 Attempt any Two (each carries 8 marks):** **16**

- a) Describe the purpose of Regression models and explain linear and logistic regression in detail.
- b) Elaborate the classification tree with suitable example.
- c) What are the motivation and objectives for the spread of relational marketing strategies?

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Set **P**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose correct alternatives****14**

- 1) Extraction of interesting patterns or knowledge from huge amount of data is \_\_\_\_\_.  
 a) Machine Learning                      b) Data Mining  
 c) Transaction Processing                d) Data Science
- 2) Data mining can also applied to other forms such as \_\_\_\_\_.  
 i) Data streams  
 ii) Sequence data  
 iii) Networked data  
 iv) Text data  
 v) Spatial data  
 a) i, ii, iii and v only                      b) ii, iii, iv and v only  
 c) i, iii, iv and v only                      d) All i, ii, iii, iv and v
- 3) Which of the following is not a data mining functionality?  
 a) Characterization and Discrimination (classification)  
 b) Classification and regression  
 c) Selection and interpretation  
 d) Clustering and Analysis
- 4) Decision Tree is a \_\_\_\_\_ technique  
 a) Clustering                                  b) Classification  
 c) Primary                                      d) Rule cancelling
- 5) \_\_\_\_\_ is a summarization of the general characteristics or features of a target class of data.  
 a) Data Characterization                      b) Data Classification  
 c) Data discrimination                      d) Data selection
- 6) Filling missing values is a method involved in \_\_\_\_\_.  
 a) Data storage                                  b) Data Cleaning  
 c) Data Integrity                                d) Data Dictionary
- 7) Strategic value of data mining is \_\_\_\_\_.  
 a) cost-sensitive                                b) work-sensitive  
 c) time-sensitive                                d) technical-sensitive

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any three** **12**

- a) What is data mining?
- b) Explain classic problems in machine learning that are highly related to data mining.
- c) What are different forms of data preprocessing?
- d) Illustrate the steps followed by the Web mining framework w.r.t. Health care and Medical data.

**Q.3 Solve any two** **16**

- a) Define each of the following data mining functionalities: characterization, discrimination, association and correlation analysis, classification, regression, clustering, and outlier analysis. Give examples of each data mining functionality, using a real-life database that you are familiar with.
- b) Use a flowchart to summarize the following procedures for attribute subset selection
  - a) stepwise forward selection
  - b) stepwise backward elimination
  - c) a combination of forward selection and backward elimination
- c) What are major issues in data mining?

**Section – II**

**Q.4 Solve any three** **12**

- a) Explain large itemset algorithm
- b) How do you measure the quality of rules
- c) What are advanced association rule techniques?
- d) Explain decision tree based algorithms.

**Q.5 Solve any two** **16**

- a) Give an example for Apriori with transaction and explain Apriori-gen-algorithm.
- b) Explain sampling algorithm with an example.
- c) What do you mean by partitioning?

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose correct alternatives**

**14**

- 1) The various aspects of data mining methodologies is/are \_\_\_\_\_.
  - i) Mining various and new kinds of knowledge
  - ii) Mining knowledge in multidimensional space
  - iii) Pattern evaluation and pattern or constraint-guided mining
  - iv) Handling uncertainty, noise, or incompleteness of data
  - a) i, ii and iv only
  - b) ii, iii and iv only
  - c) i, ii and iii only
  - d) All i, ii, iii and iv
- 2) The full form of KDD is \_\_\_\_\_.
  - a) Knowledge Database
  - b) Knowledge Discovery Database
  - c) Knowledge Data House
  - d) Knowledge Data Definition
- 3) Cluster is \_\_\_\_\_.
  - a) Group on a training data set to transform or simplify data in order to prepare it for a machine-learning algorithm
  - b) Group of similar objects that differ significantly from other objects
  - c) Symbolic representation of facts or ideas from which information can potentially be extracted
  - d) Both a and b
- 4) The \_\_\_\_\_ is a symbolic representation of facts or ideas from which information can potentially be extracted.
  - a) knowledge
  - b) data
  - c) algorithm**
  - d) program
- 5) The \_\_\_\_\_ refers to extracting knowledge from larger amount of data.
  - a) data abstraction
  - b) data warehouse
  - c) database**
  - d) data mining
- 6) Knowledge discovery in database refers to \_\_\_\_\_.
  - a) whole process of extraction of knowledge from data
  - b) selection of data
  - c) coding
  - d) cleaning the data

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any three** **12**

- a) What is data mining?
- b) Explain classic problems in machine learning that are highly related to data mining.
- c) What are different forms of data preprocessing?
- d) Illustrate the steps followed by the Web mining framework w.r.t. Health care and Medical data.

**Q.3 Solve any two** **16**

- a) Define each of the following data mining functionalities: characterization, discrimination, association and correlation analysis, classification, regression, clustering, and outlier analysis. Give examples of each data mining functionality, using a real-life database that you are familiar with.
- b) Use a flowchart to summarize the following procedures for attribute subset selection
  - a) stepwise forward selection
  - b) stepwise backward elimination
  - c) a combination of forward selection and backward elimination
- c) What are major issues in data mining?

**Section – II**

**Q.4 Solve any three** **12**

- a) Explain large itemset algorithm
- b) How do you measure the quality of rules
- c) What are advanced association rule techniques?
- d) Explain decision tree based algorithms.

**Q.5 Solve any two** **16**

- a) Give an example for Apriori with transaction and explain Apriori-gen-algorithm.
- b) Explain sampling algorithm with an example.
- c) What do you mean by partitioning?

Seat No.	
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose correct alternatives**

**14**

- 1) The \_\_\_\_\_ is a symbolic representation of facts or ideas from which information can potentially be extracted.
 

a) knowledge	b) data
<b>c) algorithm</b>	d) program
- 2) The \_\_\_\_\_ refers to extracting knowledge from larger amount of data.
 

a) data abstraction	b) data warehouse
<b>c) database</b>	d) data mining
- 3) Knowledge discovery in database refers to \_\_\_\_\_.
 

a) whole process of extraction of knowledge from data
b) selection of data
c) coding
d) cleaning the data
- 4) Data mining is used to refer \_\_\_\_\_ stage in knowledge discovery in database.
 

a) selection	b) retrieving
c) discovery	d) coding
- 5) Extraction of interesting patterns or knowledge from huge amount of data is \_\_\_\_\_.
 

a) Machine Learning	b) Data Mining
c) Transaction Processing	d) Data Science
- 6) Data mining can also applied to other forms such as \_\_\_\_\_.
 

i) Data streams	
ii) Sequence data	
iii) Networked data	
iv) Text data	
v) Spatial data	
a) i, ii, iii and v only	b) ii, iii, iv and v only
c) i, iii, iv and v only	d) All i, ii, iii, iv and v

- 7) Which of the following is not a data mining functionality?
- a) Characterization and Discrimination (classification)
  - b) Classification and regression
  - c) Selection and interpretation
  - d) Clustering and Analysis
- 8) Decision Tree is a \_\_\_\_\_ technique
- a) Clustering
  - b) Classification
  - c) Primary
  - d) Rule cancelling
- 9) \_\_\_\_\_ is a summarization of the general characteristics or features of a target class of data.
- a) Data Characterization
  - b) Data Classification
  - c) Data discrimination
  - d) Data selection
- 10) Filling missing values is a method involved in \_\_\_\_\_.
- a) Data storage
  - b) Data Cleaning
  - c) Data Integrity**
  - d) Data Dictionary
- 11) Strategic value of data mining is \_\_\_\_\_.
- a) cost-sensitive
  - b) work-sensitive
  - c) time-sensitive**
  - d) technical-sensitive
- 12) The various aspects of data mining methodologies is/are \_\_\_\_\_
- i) Mining various and new kinds of knowledge
  - ii) Mining knowledge in multidimensional space
  - iii) Pattern evaluation and pattern or constraint-guided mining
  - iv) Handling uncertainty, noise, or incompleteness of data
- a) i, ii and iv only
  - b) ii, iii and iv only
  - c) i, ii and iii only
  - d) All i, ii, iii and iv
- 13) The full form of KDD is \_\_\_\_\_.
- a) Knowledge Database
  - b) Knowledge Discovery Database
  - c) Knowledge Data House
  - d) Knowledge Data Definition
- 14) Cluster is \_\_\_\_\_.
- a) Group on a training data set to transform or simplify data in order to prepare it for a machine-learning algorithm
  - b) Group of similar objects that differ significantly from other objects
  - c) Symbolic representation of facts or ideas from which information can potentially be extracted
  - d) Both a and b

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**Set R**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any three** **12**

- a) What is data mining?
- b) Explain classic problems in machine learning that are highly related to data mining.
- c) What are different forms of data preprocessing?
- d) Illustrate the steps followed by the Web mining framework w.r.t. Health care and Medical data.

**Q.3 Solve any two** **16**

- a) Define each of the following data mining functionalities: characterization, discrimination, association and correlation analysis, classification, regression, clustering, and outlier analysis. Give examples of each data mining functionality, using a real-life database that you are familiar with.
- b) Use a flowchart to summarize the following procedures for attribute subset selection
  - a) stepwise forward selection
  - b) stepwise backward elimination
  - c) a combination of forward selection and backward elimination
- c) What are major issues in data mining?

**Section – II**

**Q.4 Solve any three** **12**

- a) Explain large itemset algorithm
- b) How do you measure the quality of rules
- c) What are advanced association rule techniques?
- d) Explain decision tree based algorithms.

**Q.5 Solve any two** **16**

- a) Give an example for Apriori with transaction and explain Apriori-gen-algorithm.
- b) Explain sampling algorithm with an example.
- c) What do you mean by partitioning?

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any three** **12**

- a) What is data mining?
- b) Explain classic problems in machine learning that are highly related to data mining.
- c) What are different forms of data preprocessing?
- d) Illustrate the steps followed by the Web mining framework w.r.t. Health care and Medical data.

**Q.3 Solve any two** **16**

- a) Define each of the following data mining functionalities: characterization, discrimination, association and correlation analysis, classification, regression, clustering, and outlier analysis. Give examples of each data mining functionality, using a real-life database that you are familiar with.
- b) Use a flowchart to summarize the following procedures for attribute subset selection
  - a) stepwise forward selection
  - b) stepwise backward elimination
  - c) a combination of forward selection and backward elimination
- c) What are major issues in data mining?

**Section – II**

**Q.4 Solve any three** **12**

- a) Explain large itemset algorithm
- b) How do you measure the quality of rules
- c) What are advanced association rule techniques?
- d) Explain decision tree based algorithms.

**Q.5 Solve any two** **16**

- a) Give an example for Apriori with transaction and explain Apriori-gen-algorithm.
- b) Explain sampling algorithm with an example.
- c) What do you mean by partitioning?

<b>Seat No.</b>	
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**COMPUTER SCIENCE & ENGINEERING**

**Management Information System**

Day & Date: Tuesday, 14-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) Management information systems (MIS) \_\_\_\_\_.
  - a) create and share documents that support day-to-day office activities
  - b) process business transactions (e.g., time cards, payments, orders, etc.)
  - c) capture and reproduce the knowledge of an expert problem solver
  - d) use the transaction data to produce information needed by managers to run the business
- 2) The MIS helps the \_\_\_\_\_ management in goal setting, strategic planning, and evolving the business plans and their implementation.
  - a) low level
  - b) middle level
  - c) top level
  - d) base level
- 3) Organizational culture is powerful unifying force than \_\_\_\_\_.
  - a) Restrains political conflict
  - b) Restrains common understanding
  - c) Restrains agreement on procedures and practices
  - d) All of the above
- 4) \_\_\_\_\_ is the first step in system development life cycle.
  - a) Designing
  - b) Planning
  - c) Analysis
  - d) Implementation
- 5) Which of the following is not an IT infrastructure service component?
  - a) operating system software
  - b) computing platforms to provide a coherent digital environment
  - c) physical facilities management to manage the facilities housing physical components
  - d) IT education services that provide training to employees
- 6) Which of the following is a data analysis technology that find hidden connection between data in disparate sources?
  - a) HIPPA
  - b) FIP
  - c) NORA
  - d) Spyware



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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- What's New in Management Information Systems?
- What is the impact of information systems on organizations?
- List and define the three legal traditions that protect intellectual property.
- What are business processes? How are they related to information systems?
- What are the challenges posed by strategic information systems?
- What specific principles for conduct can be used to guide ethical decisions?

**Q.3 Attempt any Two of the following question. 12**

- What is Organization and explain its features?
- Write and explain the Business Value Chain Model.
- List and describe the five steps in an ethical analysis.

**Section – II**

**Q.4 Attempt any Four of the following question. 16**

- What are the components of IT infrastructure?
- List and describe the problems of the traditional file environment.
- Define DoS attacks.
- What are the principal components of telecommunications networks?
- Describe the principal e-commerce business models.
- What is meant by security? Explain the need of security.

**Q.5 Attempt any Two of the following question. 12**

- What are the current trends in computer hardware platforms?
- What are the principal technologies and standards for wireless networking and Internet access?
- Explain the role of m-commerce in business with its applications.

Seat No.	
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Set Q
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**COMPUTER SCIENCE & ENGINEERING**

**Management Information System**

Day & Date: Tuesday, 14-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) All of the following are current hardware platform trends except \_\_\_\_\_.  
 a) green computing                      b) Virtualization  
 c) Cloud computing                      d) Unix
- 2) What is at the heart of any ERP system?  
 a) Information                      b) Employees  
 c) Customer                      d) Database
- 3) Which of the following is not one of the three main components in a decision support system?  
 a) Model                      b) Communications  
 c) Data                      d) Dialogue
- 4) Business Intelligence and data warehousing are used for which of the following?  
 a) Data mining  
 b) Analysis of large volumes of product sales data  
 c) What-if scenarios  
 d) All of the above
- 5) \_\_\_\_\_ is the capability to continue as if nothing has happened, even after a major component failure.  
 a) Redundancy                      b) Interoperability  
 c) Fault Tolerance                      d) Backup
- 6) Which of the following describes e-commerce?  
 a) Doing business electronically                      b) Doing business  
 c) Sale of goods                      d) All of the above
- 7) The segment in which business directly sells to the end consumer is called \_\_\_\_\_.  
 a) C2C                      b) P2P  
 c) B2C                      d) G2G



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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- a) What's New in Management Information Systems?
- b) What is the impact of information systems on organizations?
- c) List and define the three legal traditions that protect intellectual property.
- d) What are business processes? How are they related to information systems?
- e) What are the challenges posed by strategic information systems?
- f) What specific principles for conduct can be used to guide ethical decisions?

**Q.3 Attempt any Two of the following question. 12**

- a) What is Organization and explain its features?
- b) Write and explain the Business Value Chain Model.
- c) List and describe the five steps in an ethical analysis.

**Section – II**

**Q.4 Attempt any Four of the following question. 16**

- a) What are the components of IT infrastructure?
- b) List and describe the problems of the traditional file environment.
- c) Define DoS attacks.
- d) What are the principal components of telecommunications networks?
- e) Describe the principal e-commerce business models.
- f) What is meant by security? Explain the need of security.

**Q.5 Attempt any Two of the following question. 12**

- a) What are the current trends in computer hardware platforms?
- b) What are the principal technologies and standards for wireless networking and Internet access?
- c) Explain the role of m-commerce in business with its applications.

<b>Seat No.</b>	
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**COMPUTER SCIENCE & ENGINEERING**

**Management Information System**

Day & Date: Tuesday, 14-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) Business Intelligence and data warehousing are used for which of the following?
  - a) Data mining
  - b) Analysis of large volumes of product sales data
  - c) What-if scenarios
  - d) All of the above
- 2) \_\_\_\_\_ is the capability to continue as if nothing has happened, even after a major component failure.
  - a) Redundancy
  - b) Interoperability
  - c) Fault Tolerance
  - d) Backup
- 3) Which of the following describes e-commerce?
  - a) Doing business electronically
  - b) Doing business
  - c) Sale of goods
  - d) All of the above
- 4) The segment in which business directly sells to the end consumer is called \_\_\_\_\_.
  - a) C2C
  - b) P2P
  - c) B2C
  - d) G2G
- 5) Management information systems (MIS) \_\_\_\_\_.
  - a) create and share documents that support day-to-day office activities
  - b) process business transactions (e.g., time cards, payments, orders, etc.)
  - c) capture and reproduce the knowledge of an expert problem solver
  - d) use the transaction data to produce information needed by managers to run the business
- 6) The MIS helps the \_\_\_\_\_ management in goal setting, strategic planning, and evolving the business plans and their implementation.
  - a) low level
  - b) middle level
  - c) top level
  - d) base level

- 7) Organizational culture is powerful unifying force than \_\_\_\_\_.  
a) Restrains political conflict  
b) Restrains common understanding  
c) Restrains agreement on procedures and practices  
d) All of the above
- 8) \_\_\_\_\_ is the first step in system development life cycle.  
a) Designing  
b) Planning  
c) Analysis  
d) Implementation
- 9) Which of the following is not an IT infrastructure service component?  
a) operating system software  
b) computing platforms to provide a coherent digital environment  
c) physical facilities management to manage the facilities housing physical components  
d) IT education services that provide training to employees
- 10) Which of the following is a data analysis technology that find hidden connection between data in disparate sources?  
a) HIPPA  
b) FIP  
c) NORA  
d) Spyware
- 11) Which type of infrastructure service stores and manages corporate data and provides capabilities for analyzing the data?  
a) networking  
b) VOIP  
c) telecommunications  
d) data management
- 12) All of the following are current hardware platform trends except \_\_\_\_\_.  
a) green computing  
b) Virtualization  
c) Cloud computing  
d) Unix
- 13) What is at the heart of any ERP system?  
a) Information  
b) Employees  
c) Customer  
d) Database
- 14) Which of the following is not one of the three main components in a decision support system?  
a) Model  
b) Communications  
c) Data  
d) Dialogue

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R
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- What's New in Management Information Systems?
- What is the impact of information systems on organizations?
- List and define the three legal traditions that protect intellectual property.
- What are business processes? How are they related to information systems?
- What are the challenges posed by strategic information systems?
- What specific principles for conduct can be used to guide ethical decisions?

**Q.3 Attempt any Two of the following question. 12**

- What is Organization and explain its features?
- Write and explain the Business Value Chain Model.
- List and describe the five steps in an ethical analysis.

**Section – II**

**Q.4 Attempt any Four of the following question. 16**

- What are the components of IT infrastructure?
- List and describe the problems of the traditional file environment.
- Define DoS attacks.
- What are the principal components of telecommunications networks?
- Describe the principal e-commerce business models.
- What is meant by security? Explain the need of security.

**Q.5 Attempt any Two of the following question. 12**

- What are the current trends in computer hardware platforms?
- What are the principal technologies and standards for wireless networking and Internet access?
- Explain the role of m-commerce in business with its applications.



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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) Which of the following is a data analysis technology that find hidden connection between data in disparate sources?
 

a) HIPPA	b) FIP
c) NORA	d) Spyware
- 2) Which type of infrastructure service stores and manages corporate data and provides capabilities for analyzing the data?
 

a) networking	b) VOIP
c) telecommunications	d) data management
- 3) All of the following are current hardware platform trends except \_\_\_\_\_.
 

a) green computing	b) Virtualization
c) Cloud computing	d) Unix
- 4) What is at the heart of any ERP system?
 

a) Information	b) Employees
c) Customer	d) Database
- 5) Which of the following is not one of the three main components in a decision support system?
 

a) Model	b) Communications
c) Data	d) Dialogue
- 6) Business Intelligence and data warehousing are used for which of the following?
 

a) Data mining	
b) Analysis of large volumes of product sales data	
c) What-if scenarios	
d) All of the above	
- 7) \_\_\_\_\_ is the capability to continue as if nothing has happened, even after a major component failure.
 

a) Redundancy	b) Interoperability
c) Fault Tolerance	d) Backup
- 8) Which of the following describes e-commerce?
 

a) Doing business electronically	b) Doing business
c) Sale of goods	d) All of the above



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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- What's New in Management Information Systems?
- What is the impact of information systems on organizations?
- List and define the three legal traditions that protect intellectual property.
- What are business processes? How are they related to information systems?
- What are the challenges posed by strategic information systems?
- What specific principles for conduct can be used to guide ethical decisions?

**Q.3 Attempt any Two of the following question. 12**

- What is Organization and explain its features?
- Write and explain the Business Value Chain Model.
- List and describe the five steps in an ethical analysis.

**Section – II**

**Q.4 Attempt any Four of the following question. 16**

- What are the components of IT infrastructure?
- List and describe the problems of the traditional file environment.
- Define DoS attacks.
- What are the principal components of telecommunications networks?
- Describe the principal e-commerce business models.
- What is meant by security? Explain the need of security.

**Q.5 Attempt any Two of the following question. 12**

- What are the current trends in computer hardware platforms?
- What are the principal technologies and standards for wireless networking and Internet access?
- Explain the role of m-commerce in business with its applications.

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Set	P
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Information & Cyber Security**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Many Cyber Crimes comes under Indian Penal Code Which one of the following is an example?
  - a) Sending Threatening message by Email
  - b) Forgery of Electronic Record
  - c) Bogus Website
  - d) All of above
- 2) The following cannot be exploited by assigning or by licensing the rights of others
  - a) Patent
  - b) Design
  - c) Trademark
  - d) All of the above
- 3) What is a node?
  - a) A type of cryptocurrency
  - b) A Blockchain
  - c) A computer on a Blockchain network
  - d) An exchange
- 4) The term used for a blockchain splits is \_\_\_\_\_.
  - a) A merger
  - b) A fork
  - c) A division
  - d) None of the above
- 5) Bitcoin is created by \_\_\_\_\_.
  - a) Saifedean Ammous
  - b) Vitalik Buterin
  - c) Satoshi Nakamoto
  - d) None of the above
- 6) Which of the following is /are offered by the Hash functions?
  - a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above
- 7) In brute force attack, on average half of all possible keys must be tried to achieve success.
  - a) True
  - b) False
- 8) If the sender and receiver use different keys, the system is referred to as conventional cipher system.
  - a) True
  - b) False

- 9) Pretty good privacy (PGP) security system uses
- a) Public key cryptosystem
  - b) Private key cryptosystem
  - c) Public & Private key cryptosystem
  - d) None of the mentioned
- 10) Use Caesar's Cipher to decipher the following  
HQFUBSWHG WHAW
- a) Abandoned Lock
  - b) Encrypted Text
  - c) Abandoned Text
  - d) Encrypted Lock
- 11) IPSec is designed to provide security at the\_\_\_\_\_.
- a) Transport layer
  - b) Network layer
  - c) Application layer
  - d) Session layer
- 12) Which of the following is not a type of cyber crime?
- a) Data theft
  - b) Forgery
  - c) Damage to data and systems
  - d) installing antivirus for protection
- 13) What is cipher-block chaining?
- a) Data is logically 'ANDed' with previous block
  - b) Data is logically 'ORed' with previous block
  - c) Data is logically 'XORed' with previous block
  - d) None of the mentioned
- 14) What is a Hash Function?
- a) It creates a small flexible block of data
  - b) It creates a small fixed block of data
  - c) It creates a encrypted block of data
  - d) None of the mentioned

Seat No.	
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Set **P**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Information & Cyber Security**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Q.2 Solve any three of the following questions.** **12**

- Define and Compare Active and Passive attack.
- Explain Public Key Infrastructure with diagram.
- Using this Playfair matrix.

M	F	H	I/J	K
U	N	O	P	Q
Z	V	W	X	Y
E	L	A	R	G
D	S	T	B	C

Encrypt the given message: *Must see you over Cadogan West. Coming at once.*

- Explain – Digital Signature

**Q.3 Solve any one of the following questions.** **08**

- Encrypt the message "*meet me at the usual place at ten rather than eight oclock*" using the Hill cipher  $\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$  with the key  
 Show your calculations and the result.
- Users A and B use the Diffie-Hellman key exchange technique with a common prime  $q = 71$  and a primitive root  $\alpha = 7$ .
  - If user A has private key  $X_A = 5$ , what is A's public key  $Y_A$ ?
  - If user B has private key  $X_B = 12$ , what is B's public key  $Y_B$ ?
  - What is the shared secret key?

**Q.4 Explain in detail RSA Algorithm.** **08**

**Section – II**

**Q.5 Solve any three of the following questions.** **12**

- What is Bitcoin? List some properties of Bitcoin.
- How did forensic happen? How can this be prevented from happening again in the future?
- List some applications of block chain life.
- Explain PGP.

**Q.6 Solve any one of the following questions.**

- a)** Define block chain? And list some difference between Public and Private Blockchain.
- b)** What are Cyber Security Standards? List different Cyber Security Standards and explain any one in brief.

**Q.7 Explain Proof of Work and proof of Stake.**

**08**

<b>Seat No.</b>	
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- 8) Many Cyber Crimes comes under Indian Penal Code Which one of the following is an example?
- a) Sending Threatening message by Email
  - b) Forgery of Electronic Record
  - c) Bogus Website
  - d) All of above
- 9) The following cannot be exploited by assigning or by licensing the rights of others
- a) Patent
  - b) Design
  - c) Trademark
  - d) All of the above
- 10) What is a node?
- a) A type of cryptocurrency
  - b) A Blockchain
  - c) A computer on a Blockchain network
  - d) An exchange
- 11) The term used for a blockchain splits is\_\_\_\_\_.
- a) A merger
  - b) A fork
  - c) A division
  - d) None of the above
- 12) Bitcoin is created by \_\_\_\_\_.
- a) Saifedean Ammous
  - b) Vitalik Buterin
  - c) Satoshi Nakamoto
  - d) None of the above
- 13) Which of the following is /are offered by the Hash functions?
- a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above
- 14) In brute force attack, on average half of all possible keys must be tried to achieve success.
- a) True
  - b) False

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Set **Q**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Information & Cyber Security**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Q.2 Solve any three of the following questions.** **12**

- Define and Compare Active and Passive attack.
- Explain Public Key Infrastructure with diagram.
- Using this Playfair matrix.

M	F	H	I/J	K
U	N	O	P	Q
Z	V	W	X	Y
E	L	A	R	G
D	S	T	B	C

Encrypt the given message: *Must see you over Cadogan West. Coming at once.*

- Explain – Digital Signature

**Q.3 Solve any one of the following questions.** **08**

- Encrypt the message "*meet me at the usual place at ten rather than eight oclock*" using the Hill cipher  $\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$  with the key  
 Show your calculations and the result.
- Users A and B use the Diffie-Hellman key exchange technique with a common prime  $q = 71$  and a primitive root  $\alpha = 7$ .
  - If user A has private key  $X_A = 5$ , what is A's public key  $Y_A$ ?
  - If user B has private key  $X_B = 12$ , what is B's public key  $Y_B$ ?
  - What is the shared secret key?

**Q.4 Explain in detail RSA Algorithm.** **08**

**Section – II**

**Q.5 Solve any three of the following questions.** **12**

- What is Bitcoin? List some properties of Bitcoin.
- How did forensic happen? How can this be prevented from happening again in the future?
- List some applications of block chain life.
- Explain PGP.

**Q.6 Solve any one of the following questions.**

- a)** Define block chain? And list some difference between Public and Private Blockchain.
- b)** What are Cyber Security Standards? List different Cyber Security Standards and explain any one in brief.

**Q.7 Explain Proof of Work and proof of Stake.**

**08**

<b>Seat No.</b>	
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- 7) What is a node?
- a) A type of cryptocurrency
  - b) A Blockchain
  - c) A computer on a Blockchain network
  - d) An exchange
- 8) The term used for a blockchain splits is\_\_\_\_\_.
- a) A merger
  - b) A fork
  - c) A division
  - d) None of the above
- 9) Bitcoin is created by \_\_\_\_\_.
- a) Saifedean Ammous
  - b) Vitalik Buterin
  - c) Satoshi Nakamoto
  - d) None of the above
- 10) Which of the following is /are offered by the Hash functions?
- a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above
- 11) In brute force attack, on average half of all possible keys must be tried to achieve success.
- a) True
  - b) False
- 12) If the sender and receiver use different keys, the system is referred to as conventional cipher system.
- a) True
  - b) False
- 13) Pretty good privacy (PGP) security system uses
- a) Public key cryptosystem
  - b) Private key cryptosystem
  - c) Public & Private key cryptosystem
  - d) None of the mentioned
- 14) Use Caesar's Cipher to decipher the following  
HQFUBSWHG WHAW
- a) Abandoned Lock
  - b) Encrypted Text
  - c) Abandoned Text
  - d) Encrypted Lock

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Set **R**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Information & Cyber Security**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Q.2 Solve any three of the following questions.** **12**

- Define and Compare Active and Passive attack.
- Explain Public Key Infrastructure with diagram.
- Using this Playfair matrix.

M	F	H	I/J	K
U	N	O	P	Q
Z	V	W	X	Y
E	L	A	R	G
D	S	T	B	C

Encrypt the given message: *Must see you over Cadogan West. Coming at once.*

- Explain – Digital Signature

**Q.3 Solve any one of the following questions.** **08**

- Encrypt the message "*meet me at the usual place at ten rather than eight oclock*" using the Hill cipher  $\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$  with the key  
 Show your calculations and the result.
- Users A and B use the Diffie-Hellman key exchange technique with a common prime  $q = 71$  and a primitive root  $\alpha = 7$ .
  - If user A has private key  $X_A = 5$ , what is A's public key  $Y_A$ ?
  - If user B has private key  $X_B = 12$ , what is B's public key  $Y_B$ ?
  - What is the shared secret key?

**Q.4 Explain in detail RSA Algorithm.** **08**

**Section – II**

**Q.5 Solve any three of the following questions.** **12**

- What is Bitcoin? List some properties of Bitcoin.
- How did forensic happen? How can this be prevented from happening again in the future?
- List some applications of block chain life.
- Explain PGP.

**Q.6 Solve any one of the following questions.**

- a)** Define block chain? And list some difference between Public and Private Blockchain.
- b)** What are Cyber Security Standards? List different Cyber Security Standards and explain any one in brief.

**Q.7 Explain Proof of Work and proof of Stake.**

**08**

<b>Seat No.</b>	
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- 9) What is a Hash Function?
- a) It creates a small flexible block of data
  - b) It creates a small fixed block of data
  - c) It creates a encrypted block of data
  - d) None of the mentioned
- 10) Many Cyber Crimes comes under Indian Penal Code Which one of the following is an example?
- a) Sending Threatening message by Email
  - b) Forgery of Electronic Record
  - c) Bogus Website
  - d) All of above
- 11) The following cannot be exploited by assigning or by licensing the rights of others
- |              |                     |
|--------------|---------------------|
| a) Patent    | b) Design           |
| c) Trademark | d) All of the above |
- 12) What is a node?
- a) A type of cryptocurrency
  - b) A Blockchain
  - c) A computer on a Blockchain network
  - d) An exchange
- 13) The term used for a blockchain splits is\_\_\_\_\_.
- |               |                      |
|---------------|----------------------|
| a) A merger   | b) A fork            |
| c) A division | d) None of the above |
- 14) Bitcoin is created by \_\_\_\_\_.
- |                     |                      |
|---------------------|----------------------|
| a) Saifedean Ammous | b) Vitalik Buterin   |
| c) Satoshi Nakamoto | d) None of the above |

Seat No.	
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Set **S**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Information & Cyber Security**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Q.2 Solve any three of the following questions.** **12**

- Define and Compare Active and Passive attack.
- Explain Public Key Infrastructure with diagram.
- Using this Playfair matrix.

M	F	H	I/J	K
U	N	O	P	Q
Z	V	W	X	Y
E	L	A	R	G
D	S	T	B	C

Encrypt the given message: *Must see you over Cadogan West. Coming at once.*

- Explain – Digital Signature

**Q.3 Solve any one of the following questions.** **08**

- Encrypt the message "*meet me at the usual place at ten rather than eight oclock*" using the Hill cipher  $\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$  with the key  
 Show your calculations and the result.
- Users A and B use the Diffie-Hellman key exchange technique with a common prime  $q = 71$  and a primitive root  $\alpha = 7$ .
  - If user A has private key  $X_A = 5$ , what is A's public key  $Y_A$ ?
  - If user B has private key  $X_B = 12$ , what is B's public key  $Y_B$ ?
  - What is the shared secret key?

**Q.4 Explain in detail RSA Algorithm.** **08**

**Section – II**

**Q.5 Solve any three of the following questions.** **12**

- What is Bitcoin? List some properties of Bitcoin.
- How did forensic happen? How can this be prevented from happening again in the future?
- List some applications of block chain life.
- Explain PGP.

**Q.6 Solve any one of the following questions.**

- a)** Define block chain? And list some difference between Public and Private Blockchain.
- b)** What are Cyber Security Standards? List different Cyber Security Standards and explain any one in brief.

**Q.7 Explain Proof of Work and proof of Stake.**

**08**

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Select the characteristics of Semi-structured data
 

a) Inconsistent Structure	b) Self-describing
c) Schema blended with value	d) All
- 2) What is the characteristic of data dealing with its retention?
 

a) Volatility	b) Variability
c) Velocity	d) Volume
- 3) System will continue to function even when network partition occurs is \_\_\_\_\_ in CAP Theorem.
 

a) Consistency	b) Availability
c) Partition Tolerant	d) None of the above
- 4) Choose the human generated unstructured data
 

a) Scientific data	b) Social media data
c) point-of-scale	d) Mobile data
- 5) Analytics 3.0 provides \_\_\_\_\_.
 

a) Descriptive Statistics	b) Predictive Statistics
c) Prescriptive Statistics	d) All
- 6) The \_\_\_\_\_ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
 

a) Massively Parallel Processing
b) In-Memory analytics
c) Symmetric Multiprocessing System
d) Distributed Systems
- 7) How are keys and values presented and passed to the reducers during a standard sort and shuffle phase of MapReduce?
 

a) Keys are presented to reducer in sorted order; values for a given key are not sorted correct
b) Keys are presented to reducer in sorted order; values for a given key are sorted in ascending order
c) Keys are presented to a reducer in random order; values for a given key are not sorted
d) Keys are presented to a reducer in random order; values for a given key are sorted in ascending order

- 8) Which configuration file is used to control the HDFS replication factor?  
a) mapred-site.xml                      b) hdfs-site.xml  
c) core-site.xml                         d) yarn-site.xml
- 9) Hadoop focuses on moving \_\_\_\_\_ to \_\_\_\_\_.  
a) Code, Code                              b) Data, Data  
c) Code, Data                               d) Data, Code
- 10) Apache Cassandra is a massively scalable open source \_\_\_\_\_ database.  
a) SQL                                        b) NoSQL  
c) NewSQL                                  d) All of the mentioned
- 11) Which of the following is true about Apache Cassandra?  
a) Apache Cassandra is a free and open-source  
b) Apache Cassandra is a distributed  
c) Apache Cassandra has wide column store  
d) All of the above
- 12) Cassandra uses a protocol called \_\_\_\_\_ to discover location and state information.  
a) gossip                                      b) intercos  
c) goss                                         d) all of the mentioned
- 13) You can run Pig in batch mode using \_\_\_\_\_.  
a) Pig shell command                      b) Pig scripts  
c) Pig options                                d) All of the mentioned
- 14) Which of the following is used by Hive?  
a) HDFS for storage                        b) Map Reduce for execution  
c) RDBMS for metadata storage        d) All of the above

<b>Seat No.</b>	
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicate full marks

**Section – I**

- Q.2 Solve any three of the following questions. 12**
- a) What are the sources of unstructured data and why social media data is placed in the unstructured category? Elaborate with proper example.
  - b) How to deal with unstructured data and why an email is placed in the unstructured category? Elaborate with proper example.
  - c) Distinguish the features of Hadoop 1.0 and Hadoop 2.x and Describe with YARN architecture.
  - d) What is anatomy of File read and File? Write operations in HDFS Daemons. Write steps with the diagram.
- Q.3 Solve any one of the following questions. 08**
- a) With proper block diagram of Data warehouse and Hadoop environment show how Hadoop is different from Data warehouse.
- OR**
- b) What is CAP theorem? Why it guarantees only two terms out of three? Elaborate with reason.
- Q.4 Elaborate the Hadoop Ecosystem components according to their usage and give examples. 08**

**Section – II**

- Q.5 Solve any three of the following questions. 12**
- a) Use the MongoDB collection for students and apply the queries for CRUD operations and list the queries with output. (Consider the proper collection elements)
  - b) How writes are treated in Cassandra? Elaborate tunable consistency in Cassandra.
  - c) Elaborate Hive architecture with its components.
  - d) What is Pig Latin? Explain the ETL processing with Pig.

**Q.6 Solve any one of the following questions.**

- a) For Cassandra write the syntax for Create, Insert, Alter, Sort and write queries for the following.
- 1) Create a table employee in Cassandra which has attributes.  
{emp-id, emp-name, doj, desg, sal} and set PRIMARY KEY
  - 2) Insert data of three employees and Find all employees whose sal>40k
  - 3) Alter table to add new attribute email-id as set collection data type and insert set of email-ids for all employees.
  - 4) Sort the table by emp-name

**OR**

- b) Consider the following MongoDB Collection and for all the queries write the output

```
{
  "address": {
    "building": "1007",
    "coord": [ -73.856077, 40.848447],
    "street": "Morris Park Ave",
    "zipcode": "10462"
  },
  "borough": "Bronx",
  "cuisine": "Bakery",
  "grades": [
    { "date": { "$date": 1393804800000 }, "grade": "A", "score": 2 },
    { "date": { "$date": 1378857600000 }, "grade": "A", "score": 6 },
    { "date": { "$date": 1358985600000 }, "grade": "A", "score": 10 },
    { "date": { "$date": 1322006400000 }, "grade": "A", "score": 9 },
    { "date": { "$date": 1299715200000 }, "grade": "B", "score": 14 }
  ],
  "name": "Morris Park Bake Shop",
  "restaurant_id": "30075445"
}
```

- 1) Write a MongoDB query to insert the above data into a database "mydb" and Collection "restaurants" collection
- 2) Write a MongoDB query to display all the documents in the collection "restaurants".
- 3) Write a MongoDB query to display the fields restaurant\_id, name, borough and cuisine for all the documents in the collection "restaurants".
- 4) Write a MongoDB query to update name of the restaurant as "Bakers Shop"

**Q.7 Write HQL (HIVE QUERY LANGUAGE) queries along with its syntax for the following.**

- a) Create a table named student having fields.  
{rollno, name, year, department}
- b) Insert the data of three students from text file using LOAD statement
- c) Add three Partitions to the table and rename them to SY, TY and Finalyear
- d) Drop a Partition Finalyear from the table

<b>Seat No.</b>	
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- 10)** System will continue to function even when network partition occurs is \_\_\_\_\_ in CAP Theorem.
- a) Consistency
  - b) Availability
  - c) Partition Tolerant
  - d) None of the above
- 11)** Choose the human generated unstructured data
- a) Scientific data
  - b) Social media data
  - c) point-of-scale
  - d) Mobile data
- 12)** Analytics 3.0 provides \_\_\_\_\_.
- a) Descriptive Statistics
  - b) Predictive Statistics
  - c) Prescriptive Statistics
  - d) All
- 13)** The \_\_\_\_\_ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
- a) Massively Parallel Processing
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- 14)** How are keys and values presented and passed to the reducers during a standard sort and shuffle phase of MapReduce?
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  - c) Keys are presented to a reducer in random order; values for a given key are not sorted
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What are the sources of unstructured data and why social media data is placed in the unstructured category? Elaborate with proper example.
- How to deal with unstructured data and why an email is placed in the unstructured category? Elaborate with proper example.
- Distinguish the features of Hadoop 1.0 and Hadoop 2.x and Describe with YARN architecture.
- What is anatomy of File read and File? Write operations in HDFS Daemons. Write steps with the diagram.

**Q.3 Solve any one of the following questions. 08**

- With proper block diagram of Data warehouse and Hadoop environment show how Hadoop is different from Data warehouse.

**OR**

- What is CAP theorem? Why it guarantees only two terms out of three? Elaborate with reason.

**Q.4 Elaborate the Hadoop Ecosystem components according to their usage and give examples. 08**

**Section – II**

**Q.5 Solve any three of the following questions. 12**

- Use the MongoDB collection for students and apply the queries for CRUD operations and list the queries with output. (Consider the proper collection elements)
- How writes are treated in Cassandra? Elaborate tunable consistency in Cassandra.
- Elaborate Hive architecture with its components.
- What is Pig Latin? Explain the ETL processing with Pig.

**Q.6 Solve any one of the following questions.**

- a) For Cassandra write the syntax for Create, Insert, Alter, Sort and write queries for the following.
- 1) Create a table employee in Cassandra which has attributes.  
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**OR**

- b) Consider the following MongoDB Collection and for all the queries write the output

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    "street": "Morris Park Ave",
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  "borough": "Bronx",
  "cuisine": "Bakery",
  "grades": [
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  ],
  "name": "Morris Park Bake Shop",
  "restaurant_id": "30075445"
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```

- 1) Write a MongoDB query to insert the above data into a database "mydb" and Collection "restaurants" collection
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- a) Create a table named student having fields.  
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- d) Drop a Partition Finalyear from the table

Seat No.	
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is true about Apache Cassandra?
  - a) Apache Cassandra is a free and open-source
  - b) Apache Cassandra is a distributed
  - c) Apache Cassandra has wide column store
  - d) All of the above
- 2) Cassandra uses a protocol called \_\_\_\_\_ to discover location and state information.
  - a) gossip
  - b) intergos
  - c) goss
  - d) all of the mentioned
- 3) You can run Pig in batch mode using \_\_\_\_\_.
  - a) Pig shell command
  - b) Pig scripts
  - c) Pig options
  - d) All of the mentioned
- 4) Which of the following is used by Hive?
  - a) HDFS for storage
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  - c) RDBMS for metadata storage
  - d) All of the above
- 5) Select the characteristics of Semi-structured data
  - a) Inconsistent Structure
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  - d) All
- 6) What is the characteristic of data dealing with its retention?
  - a) Volatility
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  - c) point-of-scale
  - d) Mobile data
- 9) Analytics 3.0 provides \_\_\_\_\_.
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  - b) Predictive Statistics
  - c) Prescriptive Statistics
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- 10)** The \_\_\_\_\_ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
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  - d) yarn-site.xml
- 13)** Hadoop focuses on moving \_\_\_\_\_ to \_\_\_\_\_.
- a) Code, Code
  - b) Data, Data
  - c) Code, Data
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- 14)** Apache Cassandra is a massively scalable open source \_\_\_\_\_ database.
- a) SQL
  - b) NoSQL
  - c) NewSQL
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Seat No.	
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Set **R**

**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- What are the sources of unstructured data and why social media data is placed in the unstructured category? Elaborate with proper example.
- How to deal with unstructured data and why an email is placed in the unstructured category? Elaborate with proper example.
- Distinguish the features of Hadoop 1.0 and Hadoop 2.x and Describe with YARN architecture.
- What is anatomy of File read and File? Write operations in HDFS Daemons. Write steps with the diagram.

**Q.3 Solve any one of the following questions. 08**

- With proper block diagram of Data warehouse and Hadoop environment show how Hadoop is different from Data warehouse.

**OR**

- What is CAP theorem? Why it guarantees only two terms out of three? Elaborate with reason.

**Q.4 Elaborate the Hadoop Ecosystem components according to their usage and give examples. 08**

**Section – II**

**Q.5 Solve any three of the following questions. 12**

- Use the MongoDB collection for students and apply the queries for CRUD operations and list the queries with output. (Consider the proper collection elements)
- How writes are treated in Cassandra? Elaborate tunable consistency in Cassandra.
- Elaborate Hive architecture with its components.
- What is Pig Latin? Explain the ETL processing with Pig.

**Q.6 Solve any one of the following questions.**

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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- 1) The \_\_\_\_\_ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
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- 7) Cassandra uses a protocol called \_\_\_\_\_ to discover location and state information.
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  - b) intergos
  - c) goss
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- 8) You can run Pig in batch mode using \_\_\_\_\_.
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- 9) Which of the following is used by Hive?
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  - d) Mobile data
- 14) Analytics 3.0 provides \_\_\_\_\_.
- a) Descriptive Statistics
  - b) Predictive Statistics
  - c) Prescriptive Statistics
  - d) All

Seat No.	
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Set **S**

**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

- Q.2 Solve any three of the following questions. 12**
- What are the sources of unstructured data and why social media data is placed in the unstructured category? Elaborate with proper example.
  - How to deal with unstructured data and why an email is placed in the unstructured category? Elaborate with proper example.
  - Distinguish the features of Hadoop 1.0 and Hadoop 2.x and Describe with YARN architecture.
  - What is anatomy of File read and File? Write operations in HDFS Daemons. Write steps with the diagram.
- Q.3 Solve any one of the following questions. 08**
- With proper block diagram of Data warehouse and Hadoop environment show how Hadoop is different from Data warehouse.
- OR**
- What is CAP theorem? Why it guarantees only two terms out of three? Elaborate with reason.
- Q.4 Elaborate the Hadoop Ecosystem components according to their usage and give examples. 08**

**Section – II**

- Q.5 Solve any three of the following questions. 12**
- Use the MongoDB collection for students and apply the queries for CRUD operations and list the queries with output. (Consider the proper collection elements)
  - How writes are treated in Cassandra? Elaborate tunable consistency in Cassandra.
  - Elaborate Hive architecture with its components.
  - What is Pig Latin? Explain the ETL processing with Pig.

**Q.6 Solve any one of the following questions.**

- a) For Cassandra write the syntax for Create, Insert, Alter, Sort and write queries for the following.
- 1) Create a table employee in Cassandra which has attributes.  
{emp-id, emp-name, doj, desg, sal} and set PRIMARY KEY
  - 2) Insert data of three employees and Find all employees whose sal>40k
  - 3) Alter table to add new attribute email-id as set collection data type and insert set of email-ids for all employees.
  - 4) Sort the table by emp-name

**OR**

- b) Consider the following MongoDB Collection and for all the queries write the output

```
{
  "address": {
    "building": "1007",
    "coord": [ -73.856077, 40.848447],
    "street": "Morris Park Ave",
    "zipcode": "10462"
  },
  "borough": "Bronx",
  "cuisine": "Bakery",
  "grades": [
    { "date": { "$date": 1393804800000 }, "grade": "A", "score": 2 },
    { "date": { "$date": 1378857600000 }, "grade": "A", "score": 6 },
    { "date": { "$date": 1358985600000 }, "grade": "A", "score": 10 },
    { "date": { "$date": 1322006400000 }, "grade": "A", "score": 9 },
    { "date": { "$date": 1299715200000 }, "grade": "B", "score": 14 }
  ],
  "name": "Morris Park Bake Shop",
  "restaurant_id": "30075445"
}
```

- 1) Write a MongoDB query to insert the above data into a database "mydb" and Collection "restaurants" collection
- 2) Write a MongoDB query to display all the documents in the collection "restaurants".
- 3) Write a MongoDB query to display the fields restaurant\_id, name, borough and cuisine for all the documents in the collection "restaurants".
- 4) Write a MongoDB query to update name of the restaurant as "Bakers Shop"

**Q.7 Write HQL (HIVE QUERY LANGUAGE) queries along with its syntax for the following.**

- a) Create a table named student having fields.  
{rollno, name, year, department}
- b) Insert the data of three students from text file using LOAD statement
- c) Add three Partitions to the table and rename them to SY, TY and Finalyear
- d) Drop a Partition Finalyear from the table

## Max. Marks: 70

Marks: 14

Page 1 of 12

- 8) What is Machine Translation?
- a) Converts one human language to another
  - b) Converts human language to machine language
  - c) Converts any human language to English
  - d) Converts Machine language to human language
- 9) The more general task of co-reference resolution also includes identifying so-called “bridging relationships” involving referring expressions.
- a) True
  - b) False
  - c) Can't say
  - d) none of above
- 10) What is Morphological Segmentation?
- a) Does Discourse Analysis
  - b) Separate words into individual morphemes and identify the class of the morphemes
  - c) Is an extension of propositional logic
  - d) None of the mentioned
- 11) Given a stream of text, Named Entity Recognition determines which pronoun maps to which noun.
- a) False
  - b) True
  - c) Can't say
  - d) none of above
- 12) Natural Language generation is the main task of Natural language processing.
- a) True
  - b) False
  - c) Can't say
  - d) none of above
- 13) OCR (Optical Character Recognition) uses NLP.
- a) True
  - b) False
  - c) Can't say
  - d) none of above
- 14) Parts-of-Speech tagging determines \_\_\_\_\_.
- a) part-of-speech for each word dynamically as per meaning of the sentence
  - b) part-of-speech for each word dynamically as per sentence structure
  - c) all part-of-speech for a specific word given as input
  - d) all of the mentioned

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Natural Language Programming**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Figures to the right indicates full marks.  
2) All questions are compulsory.

**Section – I**

- Q.2 Solve any three of the following questions. 12**
- a) What is NLP? Explain the relationship of NLP with Machine Learning.
  - b) Explain Word Sense Disambiguation in detail.
  - c) Write note on parsing algorithms.
  - d) Explain different semantic roles with example.
  - e) Write note on HMM.
- Q.3 Solve any one of the following questions. 16**
- a) Explain Lexical Knowledge Networks in detail.
  - b) Explain different features of Indian language word net dictionary.
  - c) Explain Top Down Parsing Algorithms.

**Section – II**

- Q.4 Solve any three of the following questions. 12**
- a) Explain Forward Backward Probability in detail.
  - b) Write note on Speech Synthesis.
  - c) Explain UNL in detail.
  - d) Write note on HMM and Speech Recognition.
  - e) Explain Graphical Models for Sequence.
- Q.5 Solve any three of the following questions. 16**
- a) Describe in detail Applications of NLP.
  - b) Explain Phonology in detail.
  - c) Write and explain Baum Welch Algorithm.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Natural Language Programming**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) What is Machine Translation?
  - a) Converts one human language to another
  - b) Converts human language to machine language
  - c) Converts any human language to English
  - d) Converts Machine language to human language
- 2) The more general task of co-reference resolution also includes identifying so-called "bridging relationships" involving referring expressions.
  - a) True
  - b) False
  - c) Can't say
  - d) none of above
- 3) What is Morphological Segmentation?
  - a) Does Discourse Analysis
  - b) Separate words into individual morphemes and identify the class of the morphemes
  - c) Is an extension of propositional logic
  - d) None of the mentioned
- 4) Given a stream of text, Named Entity Recognition determines which pronoun maps to which noun.
  - a) False
  - b) True
  - c) Can't say
  - d) none of above
- 5) Natural Language generation is the main task of Natural language processing.
  - a) True
  - b) False
  - c) Can't say
  - d) none of above
- 6) OCR (Optical Character Recognition) uses NLP.
  - a) True
  - b) False
  - c) Can't say
  - d) none of above
- 7) Parts-of-Speech tagging determines \_\_\_\_\_.
  - a) part-of-speech for each word dynamically as per meaning of the sentence
  - b) part-of-speech for each word dynamically as per sentence structure
  - c) all part-of-speech for a specific word given as input
  - d) all of the mentioned

- 8) What is the field of Natural Language Processing (NLP)?  
a) Computer Science                      b) Artificial Intelligence  
c) Linguistics                              d) All of the mentioned
- 9) NLP is concerned with the interactions between computers and human (natural) languages.  
a) True                                      b) False  
c) Can't say                              d) none of above
- 10) What is the main challenge/s of NLP?  
a) Handling Ambiguity of Sentences  
b) Handling Tokenization  
c) Handling POS-Tagging  
d) All of the mentioned
- 11) Modern NLP algorithms are based on machine learning, especially statistical machine learning.  
a) True                                      b) False  
c) Can't say                              d) none of above
- 12) Choose from the following areas where NLP can be useful.  
a) Automatic Text Summarization  
b) Automatic Question-Answering Systems  
c) Information Retrieval  
d) All of the mentioned
- 13) Which of the following includes major tasks of NLP?  
a) Automatic Summarization              b) Discourse Analysis  
c) Machine Translation                  d) All of the mentioned
- 14) What is Co-reference Resolution?  
a) Anaphora Resolution  
b) Given a sentence or larger chunk of text, determine which words ("mentions") refer to the same objects ("entities")  
c) All of the mentioned  
d) None of the mentioned



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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Natural Language Programming**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Figures to the right indicates full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- a) What is NLP? Explain the relationship of NLP with Machine Learning.
- b) Explain Word Sense Disambiguation in detail.
- c) Write note on parsing algorithms.
- d) Explain different semantic roles with example.
- e) Write note on HMM.

**Q.3 Solve any one of the following questions. 16**

- a) Explain Lexical Knowledge Networks in detail.
- b) Explain different features of Indian language word net dictionary.
- c) Explain Top Down Parsing Algorithms.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- a) Explain Forward Backward Probability in detail.
- b) Write note on Speech Synthesis.
- c) Explain UNL in detail.
- d) Write note on HMM and Speech Recognition.
- e) Explain Graphical Models for Sequence.

**Q.5 Solve any three of the following questions. 16**

- a) Describe in detail Applications of NLP.
- b) Explain Phonology in detail.
- c) Write and explain Baum Welch Algorithm.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Natural Language Programming**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Given a stream of text, Named Entity Recognition determines which pronoun maps to which noun.
 

a) False	b) True
c) Can't say	d) none of above
- 2) Natural Language generation is the main task of Natural language processing.
 

a) True	b) False
c) Can't say	d) none of above
- 3) OCR (Optical Character Recognition) uses NLP.
 

a) True	b) False
c) Can't say	d) none of above
- 4) Parts-of-Speech tagging determines \_\_\_\_\_.
 

a) part-of-speech for each word dynamically as per meaning of the sentence
b) part-of-speech for each word dynamically as per sentence structure
c) all part-of-speech for a specific word given as input
d) all of the mentioned
- 5) What is the field of Natural Language Processing (NLP)?
 

a) Computer Science	b) Artificial Intelligence
c) Linguistics	d) All of the mentioned
- 6) NLP is concerned with the interactions between computers and human (natural) languages.
 

a) True	b) False
c) Can't say	d) none of above
- 7) What is the main challenge/s of NLP?
 

a) Handling Ambiguity of Sentences
b) Handling Tokenization
c) Handling POS-Tagging
d) All of the mentioned

- 8) Modern NLP algorithms are based on machine learning, especially statistical machine learning.
- a) True
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  - d) none of above
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- a) Automatic Text Summarization
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- 12) What is Machine Translation?
- a) Converts one human language to another
  - b) Converts human language to machine language
  - c) Converts any human language to English
  - d) Converts Machine language to human language
- 13) The more general task of co-reference resolution also includes identifying so-called "bridging relationships" involving referring expressions.
- a) True
  - b) False
  - c) Can't say
  - d) none of above
- 14) What is Morphological Segmentation?
- a) Does Discourse Analysis
  - b) Separate words into individual morphemes and identify the class of the morphemes
  - c) Is an extension of propositional logic
  - d) None of the mentioned

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Natural Language Programming**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Figures to the right indicates full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- a) What is NLP? Explain the relationship of NLP with Machine Learning.
- b) Explain Word Sense Disambiguation in detail.
- c) Write note on parsing algorithms.
- d) Explain different semantic roles with example.
- e) Write note on HMM.

**Q.3 Solve any one of the following questions. 16**

- a) Explain Lexical Knowledge Networks in detail.
- b) Explain different features of Indian language word net dictionary.
- c) Explain Top Down Parsing Algorithms.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- a) Explain Forward Backward Probability in detail.
- b) Write note on Speech Synthesis.
- c) Explain UNL in detail.
- d) Write note on HMM and Speech Recognition.
- e) Explain Graphical Models for Sequence.

**Q.5 Solve any three of the following questions. 16**

- a) Describe in detail Applications of NLP.
- b) Explain Phonology in detail.
- c) Write and explain Baum Welch Algorithm.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Natural Language Programming**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the following includes major tasks of NLP?
 

a) Automatic Summarization	b) Discourse Analysis
c) Machine Translation	d) All of the mentioned
- 2) What is Co-reference Resolution?
 

a) Anaphora Resolution
b) Given a sentence or larger chunk of text, determine which words ("mentions") refer to the same objects ("entities")
c) All of the mentioned
d) None of the mentioned
- 3) What is Machine Translation?
 

a) Converts one human language to another
b) Converts human language to machine language
c) Converts any human language to English
d) Converts Machine language to human language
- 4) The more general task of co-reference resolution also includes identifying so-called "bridging relationships" involving referring expressions.
 

a) True	b) False
c) Can't say	d) none of above
- 5) What is Morphological Segmentation?
 

a) Does Discourse Analysis
b) Separate words into individual morphemes and identify the class of the morphemes
c) Is an extension of propositional logic
d) None of the mentioned
- 6) Given a stream of text, Named Entity Recognition determines which pronoun maps to which noun.
 

a) False	b) True
c) Can't say	d) none of above
- 7) Natural Language generation is the main task of Natural language processing.
 

a) True	b) False
c) Can't say	d) none of above



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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Natural Language Programming**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Figures to the right indicates full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Solve any three of the following questions. 12**

- a) What is NLP? Explain the relationship of NLP with Machine Learning.
- b) Explain Word Sense Disambiguation in detail.
- c) Write note on parsing algorithms.
- d) Explain different semantic roles with example.
- e) Write note on HMM.

**Q.3 Solve any one of the following questions. 16**

- a) Explain Lexical Knowledge Networks in detail.
- b) Explain different features of Indian language word net dictionary.
- c) Explain Top Down Parsing Algorithms.

**Section – II**

**Q.4 Solve any three of the following questions. 12**

- a) Explain Forward Backward Probability in detail.
- b) Write note on Speech Synthesis.
- c) Explain UNL in detail.
- d) Write note on HMM and Speech Recognition.
- e) Explain Graphical Models for Sequence.

**Q.5 Solve any three of the following questions. 16**

- a) Describe in detail Applications of NLP.
- b) Explain Phonology in detail.
- c) Write and explain Baum Welch Algorithm.

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cloud Computing**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the following is essential concept related to Cloud?
 

a) Reliability	b) Productivity
c) Abstraction	d) All of the mentioned
- 2) Point out the correct statement:
 

a) A client can request access to a cloud service from any location.
b) A cloud has multiple application instances and directs requests to an instance based on conditions.
c) Computers can be partitioned into a set of virtual machines with each machine being assigned
d) All of the mentioned
- 3) Which of the following is not a type of cloud?
 

a) private	b) public
c) protected	d) hybrid
- 4) SaaS stands for?
 

a) Software as a service
b) System software and services
c) Software as a system
d) System as a service
- 5) Which delivery model is an example of a cloud computing environment that provides users access to virtual machines?
 

a) Platform as a Service	b) Software as a Service
c) Application as a Service	d) Infrastructure as a service
- 6) Which of the following is key mechanism for protecting data?
 

a) Access control	b) Auditing
c) Authentication	d) All of the mentioned
- 7) A cloud providers offers environment for building the applications that will runs from customers environment. Which Cloud computing delivery model they are using?
 

a) Platform as a Service	b) Software as a Service
c) Application as a Service	d) Infrastructure as a Service



- 8) Which of the following model type is not trusted in terms of security?
- a) Public
  - b) Private
  - c) Hybrid
  - d) None of the mentioned
- 9) Which of the following allows you to create instances of the MySQL database to support your Websites?
- a) Amazon Elastic ComputeCloud
  - b) Amazon Simple QueueService
  - c) Amazon Relational DatabaseService
  - d) Amazon Simple StorageSystem
- 10) Point out the correct statement:
- a) Except for tightly managed SaaS cloud providers, the burden of resource management is still in the hands of the user
  - b) Cloud computing vendors run very reliable networks
  - c) The low barrier to entry cannot be accompanied by a low barrier to provisioning
  - d) All of the mentioned
- 11) Point out the wrong statement:
- a) Public cloud managed by the constituent organization(s) or by a third party
  - b) A community cloud managed by the constituent organization(s) or by a third party
  - c) Private clouds may be either on- or off-premises
  - d) None of the mentioned
- 12) Point out the wrong statement:
- a) Internet consumes roughly 1 percent of the world's total power
  - b) The cost advantages of cloud computing have enabled new software vendors to create productivity applications
  - c) A client can provision computer resources without the need for interaction with cloud service provider personnel
  - d) None of the mentioned
- 13) State True or False Migrating applications to the cloud or between clouds is complicated by having data stored and managed remotely, by external organizations and usually in several locations.
- a) True
  - b) False
- 14) Which of the following is the most important area of concern in cloud computing?
- a) Security
  - b) Storage
  - c) Scalability
  - d) All of the mentioned

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cloud Computing**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks  
2) Assume suitable data wherever needed and mention it clearly.  
3) All questions are compulsory.

**Section – I**

- Q.2 Attempt any three** **12**
- a) Explain cloud service models with suitable diagram.
  - b) Explain Traditional Vs cloud computing.
  - c) Give PaaS and SaaS vendors along with offerings.
  - d) What is private cloud? Give Characteristics of Private Cloud.
- Q.3 Attempt any two** **16**
- a) Explain Financial and technological implications of running an application on public cloud.
  - b) Explain any public cloud vendor in detail.
  - c) Give implementation steps for any one of the private cloud.

**Section – II**

- Q.4 Attempt any three** **12**
- a) Explain security concerns in traditional IT.
  - b) Explain risk factors for buying cloud services for business.
  - c) Brief about migration paths for cloud.
  - d) Explain security reference model.
- Q.5 Attempt any two** **16**
- a) What are the challenges in cloud computing in terms
    - 1) Application Security
    - 2) Server Security
    - 3) Network Security
  - b) Explain issues & risk in migrating to cloud computing.
  - c) Explain how to build ROI from cloud computing.

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cloud Computing**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the following model type is not trusted in terms of security?
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  - a) Internet consumes roughly 1 percent of the world's total power
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  - c) A client can provision computer resources without the need for interaction with cloud service provider personnel
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- 6) State True or False Migrating applications to the cloud or between clouds is complicated by having data stored and managed remotely, by external organizations and usually in several locations.
  - a) True
  - b) False
- 7) Which of the following is the most important area of concern in cloud computing?
  - a) Security
  - b) Storage
  - c) Scalability
  - d) All of the mentioned
- 8) Which of the following is essential concept related to Cloud?
  - a) Reliability
  - b) Productivity
  - c) Abstraction
  - d) All of the mentioned
- 9) Point out the correct statement:
  - a) A client can request access to a cloud service from any location.
  - b) A cloud has multiple application instances and directs requests to an instance based on conditions.
  - c) Computers can be partitioned into a set of virtual machines with each machine being assigned
  - d) All of the mentioned
- 10) Which of the following is not a type of cloud?
  - a) private
  - b) public
  - c) protected
  - d) hybrid
- 11) SaaS stands for?
  - a) Software as a service
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  - a) Platform as a Service
  - b) Software as a Service
  - c) Application as a Service
  - d) Infrastructure as a Service

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cloud Computing**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks  
2) Assume suitable data wherever needed and mention it clearly.  
3) All questions are compulsory.

**Section – I**

- Q.2 Attempt any three** **12**
- a) Explain cloud service models with suitable diagram.
  - b) Explain Traditional Vs cloud computing.
  - c) Give PaaS and SaaS vendors along with offerings.
  - d) What is private cloud? Give Characteristics of Private Cloud.
- Q.3 Attempt any two** **16**
- a) Explain Financial and technological implications of running an application on public cloud.
  - b) Explain any public cloud vendor in detail.
  - c) Give implementation steps for any one of the private cloud.

**Section – II**

- Q.4 Attempt any three** **12**
- a) Explain security concerns in traditional IT.
  - b) Explain risk factors for buying cloud services for business.
  - c) Brief about migration paths for cloud.
  - d) Explain security reference model.
- Q.5 Attempt any two** **16**
- a) What are the challenges in cloud computing in terms
    - 1) Application Security
    - 2) Server Security
    - 3) Network Security
  - b) Explain issues & risk in migrating to cloud computing.
  - c) Explain how to build ROI from cloud computing.

Seat No.	
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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cloud Computing**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Point out the wrong statement:
  - a) Public cloud managed by the constituent organization(s) or by a third party
  - b) A community cloud managed by the constituent organization(s) or by a third party
  - c) Private clouds may be either on- or off-premises
  - d) None of the mentioned
- 2) Point out the wrong statement:
  - a) Internet consumes roughly 1 percent of the world's total power
  - b) The cost advantages of cloud computing have enabled new software vendors to create productivity applications
  - c) A client can provision computer resources without the need for interaction with cloud service provider personnel
  - d) None of the mentioned
- 3) State True or False Migrating applications to the cloud or between clouds is complicated by having data stored and managed remotely, by external organizations and usually in several locations.
  - a) True
  - b) False
- 4) Which of the following is the most important area of concern in cloud computing?
  - a) Security
  - b) Storage
  - c) Scalability
  - d) All of the mentioned
- 5) Which of the following is essential concept related to Cloud?
  - a) Reliability
  - b) Productivity
  - c) Abstraction
  - d) All of the mentioned
- 6) Point out the correct statement:
  - a) A client can request access to a cloud service from any location.
  - b) A cloud has multiple application instances and directs requests to an instance based on conditions.
  - c) Computers can be partitioned into a set of virtual machines with each machine being assigned
  - d) All of the mentioned

- 7) Which of the following is not a type of cloud?
- a) private
  - b) public
  - c) protected
  - d) hybrid
- 8) SaaS stands for?
- a) Software as a service
  - b) System software and services
  - c) Software as a system
  - d) System as a service
- 9) Which delivery model is an example of a cloud computing environment that provides users access to virtual machines?
- a) Platform as a Service
  - b) Software as a Service
  - c) Application as a Service
  - d) Infrastructure as a service
- 10) Which of the following is key mechanism for protecting data?
- a) Access control
  - b) Auditing
  - c) Authentication
  - d) All of the mentioned
- 11) A cloud providers offers environment for building the applications that will runs from customers environment. Which Cloud computing delivery model they are using?
- a) Platform as a Service
  - b) Software as a Service
  - c) Application as a Service
  - d) Infrastructure as a Service
- 12) Which of the following model type is not trusted in terms of security?
- a) Public
  - b) Private
  - c) Hybrid
  - d) None of the mentioned
- 13) Which of the following allows you to create instances of the MySQL database to support your Websites?
- a) Amazon Elastic ComputeCloud
  - b) Amazon Simple QueueService
  - c) Amazon Relational DatabaseService
  - d) Amazon Simple StorageSystem
- 14) Point out the correct statement:
- a) Except for tightly managed SaaS cloud providers, the burden of resource management is still in the hands of the user
  - b) Cloud computing vendors run very reliable networks
  - c) The low barrier to entry cannot be accompanied by a low barrier to provisioning
  - d) All of the mentioned

<b>Seat No.</b>	
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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cloud Computing**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks  
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3) All questions are compulsory.

**Section – I**

- Q.2 Attempt any three** **12**
- a) Explain cloud service models with suitable diagram.
  - b) Explain Traditional Vs cloud computing.
  - c) Give PaaS and SaaS vendors along with offerings.
  - d) What is private cloud? Give Characteristics of Private Cloud.
- Q.3 Attempt any two** **16**
- a) Explain Financial and technological implications of running an application on public cloud.
  - b) Explain any public cloud vendor in detail.
  - c) Give implementation steps for any one of the private cloud.

**Section – II**

- Q.4 Attempt any three** **12**
- a) Explain security concerns in traditional IT.
  - b) Explain risk factors for buying cloud services for business.
  - c) Brief about migration paths for cloud.
  - d) Explain security reference model.
- Q.5 Attempt any two** **16**
- a) What are the challenges in cloud computing in terms
    - 1) Application Security
    - 2) Server Security
    - 3) Network Security
  - b) Explain issues & risk in migrating to cloud computing.
  - c) Explain how to build ROI from cloud computing.



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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cloud Computing**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the following is key mechanism for protecting data?
 

a) Access control	b) Auditing
c) Authentication	d) All of the mentioned
- 2) A cloud providers offers environment for building the applications that will runs from customers environment. Which Cloud computing delivery model they are using?
 

a) Platform as a Service	b) Software as a Service
c) Application as a Service	d) Infrastructure as a Service
- 3) Which of the following model type is not trusted in terms of security?
 

a) Public	b) Private
c) Hybrid	d) None of the mentioned
- 4) Which of the following allows you to create instances of the MySQL database to support your Websites?
 

a) Amazon Elastic ComputeCloud
b) Amazon Simple QueueService
c) Amazon Relational DatabaseService
d) Amazon Simple StorageSystem
- 5) Point out the correct statement:
 

a) Except for tightly managed SaaS cloud providers, the burden of resource management is still in the hands of the user
b) Cloud computing vendors run very reliable networks
c) The low barrier to entry cannot be accompanied by a low barrier to provisioning
d) All of the mentioned
- 6) Point out the wrong statement:
 

a) Public cloud managed by the constituent organization(s) or by a third party
b) A community cloud managed by the constituent organization(s) or by a third party
c) Private clouds may be either on- or off-premises
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- 7) Point out the wrong statement:
- a) Internet consumes roughly 1 percent of the world's total power
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- 8) State True or False Migrating applications to the cloud or between clouds is complicated by having data stored and managed remotely, by external organizations and usually in several locations.
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- 14) Which delivery model is an example of a cloud computing environment that provides users access to virtual machines?
- a) Platform as a Service
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  - c) Application as a Service
  - d) Infrastructure as a service

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cloud Computing**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks  
2) Assume suitable data wherever needed and mention it clearly.  
3) All questions are compulsory.

**Section – I**

- Q.2 Attempt any three** **12**
- a) Explain cloud service models with suitable diagram.
  - b) Explain Traditional Vs cloud computing.
  - c) Give PaaS and SaaS vendors along with offerings.
  - d) What is private cloud? Give Characteristics of Private Cloud.
- Q.3 Attempt any two** **16**
- a) Explain Financial and technological implications of running an application on public cloud.
  - b) Explain any public cloud vendor in detail.
  - c) Give implementation steps for any one of the private cloud.

**Section – II**

- Q.4 Attempt any three** **12**
- a) Explain security concerns in traditional IT.
  - b) Explain risk factors for buying cloud services for business.
  - c) Brief about migration paths for cloud.
  - d) Explain security reference model.
- Q.5 Attempt any two** **16**
- a) What are the challenges in cloud computing in terms
    - 1) Application Security
    - 2) Server Security
    - 3) Network Security
  - b) Explain issues & risk in migrating to cloud computing.
  - c) Explain how to build ROI from cloud computing.

<b>Seat No.</b>	
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- 8) Which of the option is correct regarding following statement?  
Statement 1. Auto encoders are a supervised learning technique.  
Statement 2. Auto encoder's output is exactly the same as the input
- a) Both the statements are TRUE
  - b) Statement 1 is TRUE, but statement 2 is FALSE.
  - c) Statement 1 is FALSE, but statement 2 is TRUE
  - d) Both the statements are FALSE
- 9) Which of the following statement is true regarding dropout?
- 1) Dropout gives a way to approximate by combining many different architectures
  - 2) Dropout demands high learning rates
  - 3) Dropout can help preventing overfitting
- a) Both 1 and 2
  - b) Both 1 and 3
  - c) Both 2 and 3
  - d) All 1, 2 and 3
- 10) IN Neural Network The input from Input layer is then feed into the \_\_\_\_.
- a) Input layer
  - b) Output layer
  - c) Hidden layer
  - d) None of these
- 11) \_\_\_\_\_ computes the output volume by computing dot product between all filters and image patch.
- a) Input Layer
  - b) Convolution Layer
  - c) Activation Function Layer
  - d) Pool Layer
- 12) \_\_\_\_\_ is a pooling operation that selects the maximum element from the region of the feature map covered by the filter.
- a) Max Pooling
  - b) Average Pooling
  - c) Global pooling
  - d) none of these
- 13) The rate at which cost changes with respect to weight or bias is called \_\_\_\_.
- a) Derivative
  - b) Gradient
  - c) Rate of Change
  - d) Loss
- 14) Recurrent Neural Networks are best suited for Text Processing.
- a) True
  - b) False

Seat No.	
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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Deep Learning**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Attempt any four** **16**
- Write differences between LOOCV and K fold cross validation.
  - Explain under fitting and overfitting.
  - Assume a simple deep learning model with 3 neurons and inputs = 1, 2, 3. The weights to the input neurons are 7, 8 and 9 respectively. Assume the activation function is a linear constant value of 2. Calculate the output.
  - Describe Gradient based Learning.
  - Write a short note on
    - Early stopping
    - Dropout
- Q.3 Attempt any one** **06**
- What is drawback of RNN? How it is overcome by LSTM? Explain it in details.
  - Explain different convolutional Neural network operations.
- Q.4 Attempt the following** **06**
- Explain various activation functions

**Section – II**

- Q.5 Attempt any Four** **16**
- Explain Deep Architectures of computer Vision.
  - Explain Metric Learning.
  - Write different applications of auto encoder.
  - Explain Siamese Networks.
  - Explain the use of auto encoder in dimensionality reduction & classification.
- Q.6 Attempt any one** **06**
- Define Transfer Learning. Explain in detail
  - Explain RMS Prop Deep Learning Optimizer for RNNs.
- Q.7 Attempt the following** **06**
- What are the different types of auto encoder explain it in details?

Seat No.	
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Set Q
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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Deep Learning**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Make suitable assumptions (if necessary and state them clearly)

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the option is correct regarding following statement?  
 Statement 1. Auto encoders are a supervised learning technique.  
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  - a) Both the statements are TRUE
  - b) Statement 1 is TRUE, but statement 2 is FALSE.
  - c) Statement 1 is FALSE, but statement 2 is TRUE
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- 2) Which of the following statement is true regarding dropout?
  - 1) Dropout gives a way to approximate by combining many different architectures
  - 2) Dropout demands high learning rates
  - 3) Dropout can help preventing overfitting
  - a) Both 1 and 2
  - b) Both 1 and 3
  - c) Both 2 and 3
  - d) All 1, 2 and 3
- 3) IN Neural Network The input from Input layer is then feed into the \_\_\_\_\_.
  - a) Input layer
  - b) Output layer
  - c) Hidden layer
  - d) None of these
- 4) \_\_\_\_\_ computes the output volume by computing dot product between all filters and image patch.
  - a) Input Layer
  - b) Convolution Layer
  - c) Activation Function Layer
  - d) Pool Layer
- 5) \_\_\_\_\_ is a pooling operation that selects the maximum element from the region of the feature map covered by the filter.
  - a) Max Pooling
  - b) Average Pooling
  - c) Global pooling
  - d) none of these
- 6) The rate at which cost changes with respect to weight or bias is called \_\_\_\_\_.
  - a) Derivative
  - b) Gradient
  - c) Rate of Change
  - d) Loss
- 7) Recurrent Neural Networks are best suited for Text Processing.
  - a) True
  - b) False

- 8) The number of nodes in the input layer is 10 and the hidden layer is 5. The maximum number of connections from the input layer to the hidden layer are \_\_\_\_\_.
  - a) 50
  - b) Less than 50
  - c) More than 50
  - d) It is an arbitrary value
- 9) Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of  $n$  classes ( $p_1, p_2, \dots, p_k$ ) such that sum of  $p$  over all  $n$  equals to 1?
  - a) Softmax
  - b) ReLu
  - c) Sigmoid
  - d) Tanh
- 10) Dimensionality reduction does \_\_\_\_\_.
  - a) reduce computational time
  - b) may lead to some data loss
  - c) remove redundant feature
  - d) all
- 11) Under fitting means \_\_\_\_\_.
  - a) low bias & high variance
  - b) high bias & low variance
  - c) low bias & low variance
  - d) high bias & high variance
- 12) De-noising and Contractive are examples of \_\_\_\_\_.
  - a) Auto encoders
  - b) Convolution Neural Networks
  - c) Recurrent Neural Networks
  - d) None
- 13) The reuse of a pre-trained model on a new problem is known as \_\_\_\_\_.
  - a) Learning rate
  - b) Bias
  - c) variance
  - d) transfer learning
- 14) In the neural network, every parameter can have their different learning rate.
  - a) True
  - b) False
  - c) Can't say
  - d) none of this



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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Deep Learning**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any four** **16**
- Write differences between LOOCV and K fold cross validation.
  - Explain under fitting and overfitting.
  - Assume a simple deep learning model with 3 neurons and inputs = 1, 2, 3. The weights to the input neurons are 7, 8 and 9 respectively. Assume the activation function is a linear constant value of 2. Calculate the output.
  - Describe Gradient based Learning.
  - Write a short note on
    - Early stopping
    - Dropout
- Q.3 Attempt any one** **06**
- What is drawback of RNN? How it is overcome by LSTM? Explain it in details.
  - Explain different convolutional Neural network operations.
- Q.4 Attempt the following** **06**
- Explain various activation functions

**Section – II**

- Q.5 Attempt any Four** **16**
- Explain Deep Architectures of computer Vision.
  - Explain Metric Learning.
  - Write different applications of auto encoder.
  - Explain Siamese Networks.
  - Explain the use of auto encoder in dimensionality reduction & classification.
- Q.6 Attempt any one** **06**
- Define Transfer Learning. Explain in detail
  - Explain RMS Prop Deep Learning Optimizer for RNNs.
- Q.7 Attempt the following** **06**
- What are the different types of auto encoder explain it in details?

Seat No.	
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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Deep Learning**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ computes the output volume by computing dot product between all filters and image patch.
 

a) Input Layer	b) Convolution Layer
c) Activation Function Layer	d) Pool Layer
- 2) \_\_\_\_\_ is a pooling operation that selects the maximum element from the region of the feature map covered by the filter.
 

a) Max Pooling	b) Average Pooling
c) Global pooling	d) none of these
- 3) The rate at which cost changes with respect to weight or bias is called \_\_\_\_\_.
 

a) Derivative	b) Gradient
c) Rate of Change	d) Loss
- 4) Recurrent Neural Networks are best suited for Text Processing.
 

a) True	b) False
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- 5) The number of nodes in the input layer is 10 and the hidden layer is 5. The maximum number of connections from the input layer to the hidden layer are \_\_\_\_\_.
 

a) 50	b) Less than 50
c) More than 50	d) It is an arbitrary value
- 6) Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of n classes ( $p_1, p_2, \dots, p_k$ ) such that sum of p over all n equals to 1?
 

a) Softmax	b) ReLu
c) Sigmoid	d) Tanh
- 7) Dimensionality reduction does \_\_\_\_\_.
 

a) reduce computational time	b) may lead to some data loss
c) remove redundant feature	d) all
- 8) Under fitting means \_\_\_\_\_.
 

a) low bias & high variance	b) high bias & low variance
c) low bias & low variance	d) high bias & high variance

- 9) De-noising and Contractive are examples of \_\_\_\_\_.  
a) Auto encoders                      b) Convolution Neural Networks  
c) Recurrent Neural Networks      d) None
- 10) The reuse of a pre-trained model on a new problem is known as \_\_\_\_\_.  
a) Learning rate                      b) Bias  
c) variance                              d) transfer learning
- 11) In the neural network, every parameter can have their different learning rate.  
a) True                                      b) False  
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- 12) Which of the option is correct regarding following statement?  
Statement 1. Auto encoders are a supervised learning technique.  
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1) Dropout gives a way to approximate by combining many different architectures  
2) Dropout demands high learning rates  
3) Dropout can help preventing overfitting  
a) Both 1 and 2                              b) Both 1 and 3  
c) Both 2 and 3                              d) All 1, 2 and 3
- 14) IN Neural Network The input from Input layer is then feed into the \_\_\_\_\_.  
a) Input layer                              b) Output layer  
c) Hidden layer                              d) None of these

Seat No.	
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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Deep Learning**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any four** **16**
- Write differences between LOOCV and K fold cross validation.
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- Q.3 Attempt any one** **06**
- What is drawback of RNN? How it is overcome by LSTM? Explain it in details.
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- Explain Deep Architectures of computer Vision.
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  - Explain the use of auto encoder in dimensionality reduction & classification.
- Q.6 Attempt any one** **06**
- Define Transfer Learning. Explain in detail
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**Seat  
No.**

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Day & Date: Wednesday, 22-02-2023  
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Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- Page 10 of 12

- 7) \_\_\_\_\_ is a pooling operation that selects the maximum element from the region of the feature map covered by the filter.
- a) Max Pooling
  - b) Average Pooling
  - c) Global pooling
  - d) none of these
- 8) The rate at which cost changes with respect to weight or bias is called \_\_\_\_\_.
- a) Derivative
  - b) Gradient
  - c) Rate of Change
  - d) Loss
- 9) Recurrent Neural Networks are best suited for Text Processing.
- a) True
  - b) False
- 10) The number of nodes in the input layer is 10 and the hidden layer is 5. The maximum number of connections from the input layer to the hidden layer are \_\_\_\_\_.
- a) 50
  - b) Less than 50
  - c) More than 50
  - d) It is an arbitrary value
- 11) Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of  $n$  classes ( $p_1, p_2, \dots, p_k$ ) such that sum of  $p$  over all  $n$  equals to 1?
- a) Softmax
  - b) ReLu
  - c) Sigmoid
  - d) Tanh
- 12) Dimensionality reduction does \_\_\_\_\_.
- a) reduce computational time
  - b) may lead to some data loss
  - c) remove redundant feature
  - d) all
- 13) Under fitting means \_\_\_\_\_.
- a) low bias & high variance
  - b) high bias & low variance
  - c) low bias & low variance
  - d) high bias & high variance
- 14) De-noising and Contractive are examples of \_\_\_\_\_.
- a) Auto encoders
  - b) Convolution Neural Networks
  - c) Recurrent Neural Networks
  - d) None

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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Deep Learning**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Attempt any four** **16**
- Write differences between LOOCV and K fold cross validation.
  - Explain under fitting and overfitting.
  - Assume a simple deep learning model with 3 neurons and inputs = 1, 2, 3. The weights to the input neurons are 7, 8 and 9 respectively. Assume the activation function is a linear constant value of 2. Calculate the output.
  - Describe Gradient based Learning.
  - Write a short note on
    - Early stopping
    - Dropout
- Q.3 Attempt any one** **06**
- What is drawback of RNN? How it is overcome by LSTM? Explain it in details.
  - Explain different convolutional Neural network operations.
- Q.4 Attempt the following** **06**
- Explain various activation functions

**Section – II**

- Q.5 Attempt any Four** **16**
- Explain Deep Architectures of computer Vision.
  - Explain Metric Learning.
  - Write different applications of auto encoder.
  - Explain Siamese Networks.
  - Explain the use of auto encoder in dimensionality reduction & classification.
- Q.6 Attempt any one** **06**
- Define Transfer Learning. Explain in detail
  - Explain RMS Prop Deep Learning Optimizer for RNNs.
- Q.7 Attempt the following** **06**
- What are the different types of auto encoder explain it in details?

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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1)  $\int (\nabla \times H) \cdot dS$  is
  - a) Zero
  - b) lenclosed
  - c) J
  - d)  $\int H \cdot dS$
- 2) If pair of + ve & -ve charges of 1C separated by distance  $2\mu m$  then the magnitude of dipole moment is
  - a) 1 C-  $\mu m$
  - b) 2 C-  $m$
  - c) 2 C-  $\mu m$
  - d) 0.5 C-  $\mu m$
- 3) Absolute permeability of free space is
  - a)  $4\pi \times 10^{-7} A/m$
  - b)  $4\pi \times 10^{-7} H/m$
  - c)  $4\pi \times 10^{-7} F/m$
  - d)  $4\pi \times 10^{-7} H/m^2$
- 4) The unit of electric field is
  - a) Newton
  - b) Coulomb/Newton
  - c) Newton/Coulomb
  - d) Coulomb/meter
- 5) Coulomb's force is proportional to
  - a) R
  - b)  $r^2$
  - c)  $1/r$
  - d)  $1/r^2$
- 6) Divergence theorem relates
  - a) Line integral with volume integral
  - b) Line integral with surface integral
  - c) Surface integral with volume integral
  - d) Surface integral with surface integral
- 7) The charge density of  $10 \text{ nC-m}^2$  is distributed on a plane  $z = -5m$ , the electric field intensity at origin is
  - a) 180 p az
  - b) - 180 p az
  - c) -10 p az
  - d) -360 p az



- 8) A quantitative relation between induced emf and rate of change of flux linkage is known as
  - a) Maxwell's law
  - b) Stoke's law
  - c) Lenz's law
  - d) Faraday's law
- 9) Which of the following is not Maxwell's equation?
  - a)  $B = \mu H$
  - b)  $E = D/\epsilon$
  - c)  $E = J/\sigma$
  - d)  $E = \epsilon D$
- 10) For reflection co-efficient  $|r| = 1/2$  VSWR is
  - a) 2
  - b) 3
  - c) C
  - d) 8
- 11) If  $\sigma = 2 \text{ mho/m}$ ,  $E = 10 \text{ V/m}$ , the conduction current density is
  - a) 10
  - b) 40
  - c) 20
  - d) 5
- 12) The  $\gamma$  is known as \_\_\_\_\_ constant.
  - a) Proportional constant
  - b) Personal constant
  - c) Parameter constant
  - d) Propagation constant
- 13) The displacement current density can be given as
  - a)  $\partial D / \partial t$
  - b)  $\partial D / \partial x$
  - c)  $\partial H / \partial t$
  - d)  $\partial B / \partial t$
- 14) The Smith chart is a polar chart which plots
  - a) R vs Z
  - b) R vs  $Z_{\text{norm}}$
  - c) T vs Z
  - d) T vs  $Z_{\text{norm}}$

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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Electromagnetic Field Theory**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Three of the following.** **12**

- State and Derive Ampere's circuital Law.
- Charge  $Q_1 = -0.3 \mu C$  is located at  $A(0.25, -0.3, 0.15)$  and second charge of  $Q_2 = 0.5 \mu C$  is at  $B(-0.1, 0.08, 0.12)$ . Find  $\vec{E}$  at  $P(0.15, 0.2, 0.5)$ .
- In the region  $1 \leq r \leq 4m$ ,  $\vec{J} = 4.5 e^{-2r} \vec{a}_z (A/m^2)$  &  $\vec{J} = 0$  elsewhere, Find current  $I$ .
- Derive an equation of potential for a dipole.

**Q.3 Attempt any Two of the following** **16**

- Calculate electric flux density at point  $P(6,4,-5)$  caused by
  - A point of 20 miliC at origin,
  - A uniform line charge of  $20 \mu C/m$  placed along z-axis and
  - A sheet charge of  $60 \mu C/m^2$  at  $X=8m$ .
- Derive an expression for electric field intensity in xy plane produced by an infinite uniform line charge placed along z axis.
- A current carrying filament carrying current of 15A in +ve Z direction lies along entire Z axis. Find  $\vec{H}$  at i) PA (4.472,0,4), ii) PB (2,-4,4)

**Section - II**

**Q.4 Attempt Any Three of the following.** **12**

- Write a note on Skin depth.
- Derive Transmission line equations starting from circuit theory.
- Find displacement current density next to your radio in air where local FM station provides a carried having  $\vec{H} = 0.2 \cos[2.10(3 \times 10^8 t - x)] \vec{a}_z A/m$
- A lossless  $50 \Omega$  transmission line terminated in  $25 + j 50 \Omega$ . Find
  - Voltage reflection coefficient and ii) VSWR

**Q.5 Attempt Any Two of the following.** **16**

- Starting from Maxwell's equation, derive wave equation for conducting media in terms of E and in terms of H.
- Derive Maxwell's equations for time varying field in terms of point form & integral form.
- Calculate secondary constants ( $Z_o$  and  $\gamma$ ) for a transmission line having primary constants as  $R = 2 \Omega/m$ ,  $G = 0.2 mho/m$ ,  $L = 1 mH/m$  and  $C = 3 \mu F/m$ . Given  $\omega = 5000 rad/sec$ .

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A quantitative relation between induced emf and rate of change of flux linkage is known as
  - a) Maxwell's law
  - b) Stoke's law
  - c) Lenz's law
  - d) Faraday's law
- 2) Which of the following is not Maxwell's equation?
  - a)  $B = \mu H$
  - b)  $E = D/\epsilon$
  - c)  $E = J/\sigma$
  - d)  $E = \epsilon D$
- 3) For reflection co-efficient  $|r| = 1/2$  VSWR is
  - a) 2
  - b) 3
  - c) C
  - d) 8
- 4) If  $\sigma = 2 \text{ mho/m}$ ,  $E = 10 \text{ V/m}$ , the conduction current density is
  - a) 10
  - b) 40
  - c) 20
  - d) 5
- 5) The  $\gamma$  is known as \_\_\_\_\_ constant.
  - a) Proportional constant
  - b) Personal constant
  - c) Parameter constant
  - d) Propagation constant
- 6) The displacement current density can be given as
  - a)  $\partial D / \partial t$
  - b)  $\partial D / \partial x$
  - c)  $\partial H / \partial t$
  - d)  $\partial B / \partial t$
- 7) The Smith chart is a polar chart which plots
  - a) R vs Z
  - b) R vs  $Z_{\text{norm}}$
  - c) T vs Z
  - d) T vs  $Z_{\text{norm}}$
- 8)  $\int (\nabla \times H) \cdot dS$  is
  - a) Zero
  - b)  $I_{\text{enclosed}}$
  - c) J
  - d)  $\int H \cdot dS$



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Set **Q**

**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Electromagnetic Field Theory**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Three of the following.** **12**

- State and Derive Ampere's circuital Law.
- Charge  $Q_1 = -0.3 \mu C$  is located at  $A(0.25, -0.3, 0.15)$  and second charge of  $Q_2 = 0.5 \mu C$  is at  $B(-0.1, 0.08, 0.12)$ . Find  $\vec{E}$  at  $P(0.15, 0.2, 0.5)$ .
- In the region  $1 \leq r \leq 4m$ ,  $\vec{J} = 4.5 e^{-2r} \vec{a}_z (A/m^2)$  &  $\vec{J} = 0$  elsewhere, Find current  $I$ .
- Derive an equation of potential for a dipole.

**Q.3 Attempt any Two of the following** **16**

- Calculate electric flux density at point  $P(6,4,-5)$  caused by
  - A point of 20 mC at origin,
  - A uniform line charge of  $20 \mu C/m$  placed along z-axis and
  - A sheet charge of  $60 \mu C/m^2$  at  $X=8m$ .
- Derive an expression for electric field intensity in xy plane produced by an infinite uniform line charge placed along z axis.
- A current carrying filament carrying current of 15A in +ve Z direction lies along entire Z axis. Find  $\vec{H}$  at i)  $PA(4.472, 0, 4)$ , ii)  $PB(2, -4, 4)$

**Section - II**

**Q.4 Attempt Any Three of the following.** **12**

- Write a note on Skin depth.
- Derive Transmission line equations starting from circuit theory.
- Find displacement current density next to your radio in air where local FM station provides a carrier having  $\vec{H} = 0.2 \cos[2.10(3 \times 10^8 t - x)] \vec{a}_z A/m$
- A lossless  $50 \Omega$  transmission line terminated in  $25 + j 50 \Omega$ . Find
  - Voltage reflection coefficient and ii) VSWR

**Q.5 Attempt Any Two of the following.** **16**

- Starting from Maxwell's equation, derive wave equation for conducting media in terms of  $E$  and in terms of  $H$ .
- Derive Maxwell's equations for time varying field in terms of point form & integral form.
- Calculate secondary constants ( $Z_o$  and  $\gamma$ ) for a transmission line having primary constants as  $R = 2 \Omega/m$ ,  $G = 0.2 mho/m$ ,  $L = 1 mH/m$  and  $C = 3 \mu F/m$ . Given  $\omega = 5000 rad/sec$ .

Seat No.	
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) If  $\sigma = 2 \text{ mho/m}$ ,  $E = 10 \text{ V/m}$ , the conduction current density is
  - a) 10
  - b) 40
  - c) 20
  - d) 5
- 2) The  $\gamma$  is known as \_\_\_\_\_ constant.
  - a) Proportional constant
  - b) Personal constant
  - c) Parameter constant
  - d) Propagation constant
- 3) The displacement current density can be given as
  - a)  $\partial D / \partial t$
  - b)  $\partial D / \partial x$
  - c)  $\partial H / \partial t$
  - d)  $\partial B / \partial t$
- 4) The Smith chart is a polar chart which plots
  - a) R vs Z
  - b) R vs Znorm
  - c) T vs Z
  - d) T vs Znorm
- 5)  $\int (\nabla \times H) \cdot dS$  is
  - a) Zero
  - b) Ienclosed
  - c) J
  - d)  $\int H \cdot dS$
- 6) If pair of + ve & -ve charges of 1C separated by distance  $2\mu\text{m}$  then the magnitude of dipole moment is
  - a) 1 C-  $\mu\text{m}$
  - b) 2 C-  $\mu\text{m}$
  - c) 2 C-  $\mu\text{m}$
  - d) 0.5 C-  $\mu\text{m}$
- 7) Absolute permeability of free space is
  - a)  $4\pi \times 10^{-7} \text{ A/m}$
  - b)  $4\pi \times 10^{-7} \text{ H/m}$
  - c)  $4\pi \times 10^{-7} \text{ F/m}$
  - d)  $4\pi \times 10^{-7} \text{ H/m}^2$
- 8) The unit of electric field is
  - a) Newton
  - b) Coulomb/Newton
  - c) Newton/Coulomb
  - d) Coulomb/meter
- 9) Coulomb's force is proportional to
  - a) r
  - b)  $r^2$
  - c)  $1/r$
  - d)  $1/r^2$

- 10) Divergence theorem relates
- a) Line integral with volume integral
  - b) Line integral with surface integral
  - c) Surface integral with volume integral
  - d) Surface integral with surface integral
- 11) The charge density of  $10 \text{ nC-m}^2$  is distributed on a plane  $z = -5\text{m}$ , the electric field intensity at origin is
- a)  $180 \text{ p az}$
  - b)  $-180 \text{ p az}$
  - c)  $-10 \text{ p az}$
  - d)  $-360 \text{ p az}$
- 12) A quantitative relation between induced emf and rate of change of flux linkage is known as
- a) Maxwell's law
  - b) Stoke's law
  - c) Lenz's law
  - d) Faraday's law
- 13) Which of the following is not Maxwell's equation?
- a)  $B = \mu H$
  - b)  $E = D/\epsilon$
  - c)  $E = J/\sigma$
  - d)  $E = \epsilon D$
- 14) For reflection co-efficient  $|r| = 1/2$  VSWR is
- a) 2
  - b) 3
  - c) C
  - d) 8

Seat No.	
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Set **R**

**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Electromagnetic Field Theory**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Three of the following.** **12**

- State and Derive Ampere's circuital Law.
- Charge  $Q_1 = -0.3 \mu C$  is located at  $A(0.25, -0.3, 0.15)$  and second charge of  $Q_2 = 0.5 \mu C$  is at  $B(-0.1, 0.08, 0.12)$ . Find  $\vec{E}$  at  $P(0.15, 0.2, 0.5)$ .
- In the region  $1 \leq r \leq 4m$ ,  $\vec{J} = 4.5 e^{-2r} \vec{a}_z (A/m^2)$  &  $\vec{J} = 0$  elsewhere, Find current  $I$ .
- Derive an equation of potential for a dipole.

**Q.3 Attempt any Two of the following** **16**

- Calculate electric flux density at point  $P(6,4,-5)$  caused by
  - A point of 20 miliC at origin,
  - A uniform line charge of  $20 \mu C/m$  placed along z-axis and
  - A sheet charge of  $60 \mu C/m^2$  at  $X=8m$ .
- Derive an expression for electric field intensity in xy plane produced by an infinite uniform line charge placed along z axis.
- A current carrying filament carrying current of 15A in +ve Z direction lies along entire Z axis. Find  $\vec{H}$  at i) PA (4.472,0,4), ii) PB (2,-4,4)

**Section - II**

**Q.4 Attempt Any Three of the following.** **12**

- Write a note on Skin depth.
- Derive Transmission line equations starting from circuit theory.
- Find displacement current density next to your radio in air where local FM station provides a carried having  $\vec{H} = 0.2 \cos[2.10(3 \times 10^8 t - x)] \vec{a}_z A/m$
- A lossless  $50 \Omega$  transmission line terminated in  $25 + j 50 \Omega$ . Find
  - Voltage reflection coefficient and ii) VSWR

**Q.5 Attempt Any Two of the following.** **16**

- Starting from Maxwell's equation, derive wave equation for conducting media in terms of E and in terms of H.
- Derive Maxwell's equations for time varying field in terms of point form & integral form.
- Calculate secondary constants ( $Z_o$  and  $\gamma$ ) for a transmission line having primary constants as  $R = 2 \Omega/m$ ,  $G = 0.2 mho/m$ ,  $L = 1 mH/m$  and  $C = 3 \mu F/m$ . Given  $\omega = 5000 rad/sec$ .



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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Divergence theorem relates
  - a) Line integral with volume integral
  - b) Line integral with surface integral
  - c) Surface integral with volume integral
  - d) Surface integral with surface integral
- 2) The charge density of  $10 \text{ nC-m}^2$  is distributed on a plane  $z = -5\text{m}$ , the electric field intensity at origin is
  - a)  $180 \text{ p az}$
  - b)  $-180 \text{ p az}$
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- 4) Which of the following is not Maxwell's equation?
  - a)  $B = \mu H$
  - b)  $E = D/\epsilon$
  - c)  $E = J/\sigma$
  - d)  $E = \epsilon D$
- 5) For reflection co-efficient  $|r| = 1/2$  VSWR is
  - a) 2
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  - d) 8
- 6) If  $\sigma = 2 \text{ mho/m}$ ,  $E = 10 \text{ V/m}$ , the conduction current density is
  - a) 10
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  - d) 5
- 7) The  $\gamma$  is known as \_\_\_\_\_ constant.
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- 8) The displacement current density can be given as
  - a)  $\partial D / \partial t$
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  - c)  $\partial H / \partial t$
  - d)  $\partial B / \partial t$

- 9) The Smith chart is a polar chart which plots
- |               |                             |
|---------------|-----------------------------|
| a) $R$ vs $Z$ | b) $R$ vs $Z_{\text{norm}}$ |
| c) $T$ vs $Z$ | d) $T$ vs $Z_{\text{norm}}$ |
- 10)  $\int (\nabla \times H) \cdot dS$  is
- |         |                          |
|---------|--------------------------|
| a) Zero | b) $I_{\text{enclosed}}$ |
| c) $J$  | d) $\int H \cdot dS$     |
- 11) If pair of + ve & -ve charges of 1C separated by distance  $2\mu m$  then the magnitude of dipole moment is
- |                              |                                |
|------------------------------|--------------------------------|
| a) $1 \text{ C} \cdot \mu m$ | b) $2 \text{ C} \cdot m$       |
| c) $2 \text{ C} \cdot \mu m$ | d) $0.5 \text{ C} \cdot \mu m$ |
- 12) Absolute permeability of free space is
- |                              |                                |
|------------------------------|--------------------------------|
| a) $4\pi \times 10^{-7} A/m$ | b) $4\pi \times 10^{-7} H/m$   |
| c) $4\pi \times 10^{-7} F/m$ | d) $4\pi \times 10^{-7} H/m^2$ |
- 13) The unit of electric field is
- |                   |                   |
|-------------------|-------------------|
| a) Newton         | b) Coulomb/Newton |
| c) Newton/Coulomb | d) Coulomb/meter  |
- 14) Coulomb's force is proportional to
- |          |            |
|----------|------------|
| a) $r$   | b) $r^2$   |
| c) $1/r$ | d) $1/r^2$ |

Seat No.	
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Set **S**

**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Electromagnetic Field Theory**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section - I**

**Q.2 Attempt any Three of the following.** **12**

- State and Derive Ampere's circuital Law.
- Charge  $Q_1 = -0.3 \mu C$  is located at  $A(0.25, -0.3, 0.15)$  and second charge of  $Q_2 = 0.5 \mu C$  is at  $B(-0.1, 0.08, 0.12)$ . Find  $\vec{E}$  at  $P(0.15, 0.2, 0.5)$ .
- In the region  $1 \leq r \leq 4m$ ,  $\vec{J} = 4.5 e^{-2r} \vec{a}_z (A/m^2)$  &  $\vec{J} = 0$  elsewhere, Find current  $I$ .
- Derive an equation of potential for a dipole.

**Q.3 Attempt any Two of the following** **16**

- Calculate electric flux density at point  $P(6,4,-5)$  caused by
  - A point of 20 mC at origin,
  - A uniform line charge of  $20 \mu C/m$  placed along z-axis and
  - A sheet charge of  $60 \mu C/m^2$  at  $X=8m$ .
- Derive an expression for electric field intensity in xy plane produced by an infinite uniform line charge placed along z axis.
- A current carrying filament carrying current of 15A in +ve Z direction lies along entire Z axis. Find  $\vec{H}$  at i)  $PA(4.472, 0, 4)$ , ii)  $PB(2, -4, 4)$

**Section - II**

**Q.4 Attempt Any Three of the following.** **12**

- Write a note on Skin depth.
- Derive Transmission line equations starting from circuit theory.
- Find displacement current density next to your radio in air where local FM station provides a carrier having  $\vec{H} = 0.2 \cos[2.10(3 \times 10^8 t - x)] \vec{a}_z A/m$
- A lossless  $50 \Omega$  transmission line terminated in  $25 + j 50 \Omega$ . Find
  - Voltage reflection coefficient and ii) VSWR

**Q.5 Attempt Any Two of the following.** **16**

- Starting from Maxwell's equation, derive wave equation for conducting media in terms of  $E$  and in terms of  $H$ .
- Derive Maxwell's equations for time varying field in terms of point form & integral form.
- Calculate secondary constants ( $Z_o$  and  $\gamma$ ) for a transmission line having primary constants as  $R = 2 \Omega/m$ ,  $G = 0.2 mho/m$ ,  $L = 1 mH/m$  and  $C = 3 \mu F/m$ . Given  $\omega = 5000 rad/sec$ .

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) Which of the following is the False reasons for writing programs in C for micro-controller \_\_\_\_\_.
  - a) You can use code available in function libraries
  - b) It is easier and less time consuming to write in C than Assembly
  - c) C code is portable to other microcontroller with little of no modification
  - d) C is difficult to modify and update
- 2) Addressing mode for the source data in the instruction move a, @a + PC2 points \_\_\_\_\_.
  - a) Immediate
  - b) Indirect
  - c) Direct
  - d) Register Indexed
- 3) PIC 16F877 devices \_\_\_\_\_ bit program counter capable of addressing \_\_\_\_\_ program memory.
  - a) 8,256 k × 8
  - b) 14,8 k × 14
  - c) 16,64 k × 8
  - d) 13,8 k × 14
- 4) After stack has been pushed eight times, the ninth push is \_\_\_\_\_.
  - a) overwrites the value that was stored from the first push
  - b) overwrites the value that was stored from the last push
  - c) Result in loss of pushed data
  - d) sets stack overflow bit
- 5) Before execution of ANDL W 0 × 5f the working register contents where 0 × A3. The contents after execution will be \_\_\_\_\_.
  - a) 0 × 00
  - b) 0 × 03
  - c) 0 × FF
  - d) 0 × 5f
- 6) CALL and GOTO instructions provides \_\_\_\_\_ bits address to allow branching within any \_\_\_\_\_ program memory.
  - a) 11, 2k
  - b) 16, 64k
  - c) 8,368Bytes
  - d) 13, 8k



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain following instructions.
  - 1) MUL AB
  - 2) DIV AB
  - 3) JNB 80h, relative address
  - 4) XCHD
- b) Compare Harvard and von Neumann architecture.
- c) What is the difference between timer mode and Counter mode? Explain TMOD SFR in detail.
- d) Write an 8051 C program to toggle all the bits of P1 continuously.
- e) Explain UART mode 1 for 8051 Microcontroller.
- f) Write 8051 assembly language program to find number of even and odd numbers in the given array of 8-bit numbers, stored from address 9001h and length of array is at 9000h. Store result at 9050h and 9051h.

**Q.3 Solve any two of the following.** **12**

- a) Explain timer module with GATE bit and INTx pin. Also explain in detail mode 3 of timer of Microcontroller.
- b) Discuss with suitable example Addressing modes of 8051 Microcontroller.
- c) Interface LCD(16\*2) to 8051. Write assembly or embedded C prog to display "PAHSUS" on LCD.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Enlist different features of PIC 16F877a.
- b) Explain Capture mode in CCP1 module.
- c) Explain following instructions.
  - 1) INCFSZ
  - 2) BSF
  - 3) SUBWF
- d) Discuss significance of bits in STATUS register when its contents are "BD"H.
- e) Draw and Explain the bit format for INTCON.
- f) Explain steps for ADC conversion on 2<sup>nd</sup> channel in PIC16F877a.

**Q.5 Solve any two of the following.**

- a)** With Block diagram explain operation of CCP module in PWM mode. How PWM module can be used to generate a duty cycle of 80%?
- b)** Explain interrupts in PIC16f877a in detail.
- c)** Explain Direct and Indirect addressing modes in PIC. What is the use of IRP bit for it? Give one example of each addressing Mode.

<b>Seat No.</b>	
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- 7) When the RET instruction at the end of subroutine is executed, \_\_\_\_\_.  
 a) the information where the stack is initialized is transferred to the stack pointer  
 b) the memory address of the RET instruction is transferred to the program counter  
 c) two data bytes stored in the top two locations of the stack are transferred to the program counter  
 d) two data bytes stored in the top two locations of the stack are transferred to the stack pointer
- 8) Which of the following is the False reasons for writing programs in C for micro-controller \_\_\_\_\_.  
 a) You can use code available in function libraries  
 b) It is easier and less time consuming to write in C than Assembly  
 c) C code is portable to other microcontroller with little of no modification  
 d) C is difficult to modify and update
- 9) Addressing mode for the source data in the instruction move a, @a + PC2 points \_\_\_\_\_.  
 a) Immediate  
 b) Indirect  
 c) Direct  
 d) Register Indexed
- 10) PIC 16F877 devices \_\_\_\_\_ bit program counter capable of addressing \_\_\_\_\_ program memory.  
 a) 8,256 k × 8  
 b) 14,8 k × 14  
 c) 16,64 k × 8  
 d) 13,8 k × 14
- 11) After stack has been pushed eight times, the ninth push is \_\_\_\_\_.  
 a) overwrites the value that was stored from the first push  
 b) overwrites the value that was stored from the last push  
 c) Result in loss of pushed data  
 d) sets stack overflow bit
- 12) Before execution of ANDL W 0 × 5f the working register contents where 0 × A3. The contents after execution will be \_\_\_\_\_.  
 a) 0 × 00  
 b) 0 × 03  
 c) 0 × FF  
 d) 0 × 5f
- 13) CALL and GOTO instructions provides \_\_\_\_\_ bits address to allow branching within any \_\_\_\_\_ program memory.  
 a) 11, 2k  
 b) 16, 64k  
 c) 8,368Bytes  
 d) 13, 8k
- 14) Which bit in INTCON register allows to either enable or disable all interrupt  
 a) INTE  
 b) GIE  
 c) RBIE  
 d) ADIE

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain following instructions.
  - 1) MUL AB
  - 2) DIV AB
  - 3) JNB 80h, relative address
  - 4) XCHD
- b) Compare Harvard and von Neumann architecture.
- c) What is the difference between timer mode and Counter mode? Explain TMOD SFR in detail.
- d) Write an 8051 C program to toggle all the bits of P1 continuously.
- e) Explain UART mode 1 for 8051 Microcontroller.
- f) Write 8051 assembly language program to find number of even and odd numbers in the given array of 8-bit numbers, stored from address 9001h and length of array is at 9000h. Store result at 9050h and 9051h.

**Q.3 Solve any two of the following.** **12**

- a) Explain timer module with GATE bit and INTx pin. Also explain in detail mode 3 of timer of Microcontroller.
- b) Discuss with suitable example Addressing modes of 8051 Microcontroller.
- c) Interface LCD(16\*2) to 8051. Write assembly or embedded C prog to display "PAHSUS" on LCD.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Enlist different features of PIC 16F877a.
- b) Explain Capture mode in CCP1 module.
- c) Explain following instructions.
  - 1) INCFSZ
  - 2) BSF
  - 3) SUBWF
- d) Discuss significance of bits in STATUS register when its contents are "BD"H.
- e) Draw and Explain the bit format for INTCON.
- f) Explain steps for ADC conversion on 2<sup>nd</sup> channel in PIC16F877a.

**Q.5 Solve any two of the following.**

- a) With Block diagram explain operation of CCP module in PWM mode. How PWM module can be used to generate a duty cycle of 80%?
- b) Explain interrupts in PIC16f877a in detail.
- c) Explain Direct and Indirect addressing modes in PIC. What is the use of IRP bit for it? Give one example of each addressing Mode.

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) When the 8051 is reset and the /EA line is HIGH, the program counter points to the first program instruction in the: \_\_\_\_\_.  
 a) internal code memory                      b) external code memory  
 c) internal data memory                      d) external data memory
- 2) In microcontroller & LCD interface, which line will instruct the LCD that microcontroller sending a data or command?  
 a) DB0    b) RW  
 c) EN    d) RS
- 3) A Harvard architecture means that a machine has \_\_\_\_\_.  
 a) separate memories for data and instructions  
 b) unified cache memory  
 c) multiple functional units  
 d) an on-chip cache
- 4) When the RET instruction at the end of subroutine is executed, \_\_\_\_\_.  
 a) the information where the stack is initialized is transferred to the stack pointer  
 b) the memory address of the RET instruction is transferred to the program counter  
 c) two data bytes stored in the top two locations of the stack are transferred to the program counter  
 d) two data bytes stored in the top two locations of the stack are transferred to the stack pointer
- 5) Which of the following is the False reasons for writing programs in C for micro-controller \_\_\_\_\_.  
 a) You can use code available in function libraries  
 b) It is easier and less time consuming to write in C than Assembly  
 c) C code is portable to other microcontroller with little of no modification  
 d) C is difficult to modify and update



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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain following instructions.
  - 1) MUL AB
  - 2) DIV AB
  - 3) JNB 80h, relative address
  - 4) XCHD
- b) Compare Harvard and von Neumann architecture.
- c) What is the difference between timer mode and Counter mode? Explain TMOD SFR in detail.
- d) Write an 8051 C program to toggle all the bits of P1 continuously.
- e) Explain UART mode 1 for 8051 Microcontroller.
- f) Write 8051 assembly language program to find number of even and odd numbers in the given array of 8-bit numbers, stored from address 9001h and length of array is at 9000h. Store result at 9050h and 9051h.

**Q.3 Solve any two of the following.** **12**

- a) Explain timer module with GATE bit and INTx pin. Also explain in detail mode 3 of timer of Microcontroller.
- b) Discuss with suitable example Addressing modes of 8051 Microcontroller.
- c) Interface LCD(16\*2) to 8051. Write assembly or embedded C prog to display "PAHSUS" on LCD.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Enlist different features of PIC 16F877a.
- b) Explain Capture mode in CCP1 module.
- c) Explain following instructions.
  - 1) INCFSZ
  - 2) BSF
  - 3) SUBWF
- d) Discuss significance of bits in STATUS register when its contents are "BD"H.
- e) Draw and Explain the bit format for INTCON.
- f) Explain steps for ADC conversion on 2<sup>nd</sup> channel in PIC16F877a.

**Q.5 Solve any two of the following.**

- a) With Block diagram explain operation of CCP module in PWM mode. How PWM module can be used to generate a duty cycle of 80%?
- b) Explain interrupts in PIC16f877a in detail.
- c) Explain Direct and Indirect addressing modes in PIC. What is the use of IRP bit for it? Give one example of each addressing Mode.

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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- CALL and GOTO instructions provides \_\_\_\_\_ bits address to allow branching within any \_\_\_\_\_ program memory.
  - 11, 2k
  - 16, 64k
  - 8,368Bytes
  - 13, 8k
- Which bit in INTCON register allows to either enable or disable all interrupt?
  - INTE
  - GIE
  - RBIE
  - ADIE
- With the available Address bus and Data bus, the total external data memory that can be interfaced to the 8051 is: \_\_\_\_\_.
  - 32K
  - 64K
  - 128K
  - 256K
- Which of the following instructions will load the value 35H into the high byte of timer 0?
  - MOV TH0, #35H
  - MOV TH0, 35H
  - MOV T0, #35H
  - MOV T0, 35H
- If we push data onto the stack then the stack pointer \_\_\_\_\_.
  - increases with every push
  - decreases with every push
  - increases with every POP
  - decreases with every POP
- When the 8051 is reset and the /EA line is HIGH, the program counter points to the first program instruction in the: \_\_\_\_\_.
  - internal code memory
  - external code memory
  - internal data memory
  - external data memory
- In microcontroller & LCD interface, which line will instruct the LCD that microcontroller sending a data or command?
  - DB0
  - RW
  - EN
  - RS



- 8) A Harvard architecture means that a machine has \_\_\_\_\_.  
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b) unified cache memory  
c) multiple functional units  
d) an on-chip cache
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b) It is easier and less time consuming to write in C than Assembly  
c) C code is portable to other microcontroller with little of no modification  
d) C is difficult to modify and update
- 11) Addressing mode for the source data in the instruction move a, @a + PC2 points \_\_\_\_\_.  
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b) Indirect  
c) Direct  
d) Register Indexed
- 12) PIC 16F877 devices \_\_\_\_\_ bit program counter capable of addressing \_\_\_\_\_ program memory.  
a) 8,256 k × 8  
b) 14,8 k × 14  
c) 16,64 k × 8  
d) 13,8 k × 14
- 13) After stack has been pushed eight times, the ninth push is \_\_\_\_\_.  
a) overwrites the value that was stored from the first push  
b) overwrites the value that was stored from the last push  
c) Result in loss of pushed data  
d) sets stack overflow bit
- 14) Before execution of ANDL W 0 × 5f the working register contents where 0 × A3. The contents after execution will be \_\_\_\_\_.  
a) 0 × 00  
b) 0 × 03  
c) 0 × FF  
d) 0 × 5f

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain following instructions.
  - 1) MUL AB
  - 2) DIV AB
  - 3) JNB 80h, relative address
  - 4) XCHD
- b) Compare Harvard and von Neumann architecture.
- c) What is the difference between timer mode and Counter mode? Explain TMOD SFR in detail.
- d) Write an 8051 C program to toggle all the bits of P1 continuously.
- e) Explain UART mode 1 for 8051 Microcontroller.
- f) Write 8051 assembly language program to find number of even and odd numbers in the given array of 8-bit numbers, stored from address 9001h and length of array is at 9000h. Store result at 9050h and 9051h.

**Q.3 Solve any two of the following.** **12**

- a) Explain timer module with GATE bit and INTx pin. Also explain in detail mode 3 of timer of Microcontroller.
- b) Discuss with suitable example Addressing modes of 8051 Microcontroller.
- c) Interface LCD(16\*2) to 8051. Write assembly or embedded C prog to display "PAHSUS" on LCD.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) Enlist different features of PIC 16F877a.
- b) Explain Capture mode in CCP1 module.
- c) Explain following instructions.
  - 1) INCFSZ
  - 2) BSF
  - 3) SUBWF
- d) Discuss significance of bits in STATUS register when its contents are "BD"H.
- e) Draw and Explain the bit format for INTCON.
- f) Explain steps for ADC conversion on 2<sup>nd</sup> channel in PIC16F877a.

**Q.5 Solve any two of the following.**

- a)** With Block diagram explain operation of CCP module in PWM mode. How PWM module can be used to generate a duty cycle of 80%?
- b)** Explain interrupts in PIC16f877a in detail.
- c)** Explain Direct and Indirect addressing modes in PIC. What is the use of IRP bit for it? Give one example of each addressing Mode.

<b>Seat No.</b>	
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- 9) The frequency sampling structure are efficient because \_\_\_\_\_.  
 a) sample points are less  
 b) some sampled DFT coefficients are zero when filter is narrow band  
 c) some sampled values can be assumed zero  
 d) parallel structures are efficient
- 10) Advantage of FIR filter is \_\_\_\_\_.  
 a) they are always stable                      b) less storage requirement  
 c) errors due to round off is less              d) None
- 11) The mapping of s-plane to z- plane in bilinear transformation is \_\_\_\_\_.  
 a)  $S = \frac{2}{3T} \left[ \frac{1-z^{-1}}{1+z^{-1}} \right]$                       b)  $S = \frac{2}{T} \left[ \frac{1-z^{-1}}{1+z^{-1}} \right]$   
 c)  $S = \frac{2}{T} \left[ \frac{1+z^{-1}}{1-z^{-1}} \right]$                       d) None
- 12) To avoid aliasing of frequency components which method is useful in designing filter \_\_\_\_\_.  
 a) impulse invariant                              b) bilinear transformation  
 c) windowing techniques                      d) None
- 13) The overall impulse response of two LTI systems connected in cascade is equal to \_\_\_\_\_.  
 a) Sum of two impulse response  
 b) Multiplication of two impulse response  
 c) Convolution of individual impulse response  
 d) None
- 14) In IIR system, which of the following structure will give direct relation between time domain and Z domain?  
 a) Direct form I                                      b) Direct form II  
 c) Cascade form                                      d) Parallel form

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Answer any four questions.**

16

- Compute auto correlation of the sequence  $x(n) = \{1, 2, 3, 4\}$
- The first 5 point of the 8 point DFT of a real valued sequence are  $\{28, -4 + j9.565, -4 + j4, -4 + j1.656, -4\}$  Determine the remaining 3 Points.
- Find IDFT of  $X(k) = \{50, 2 - j2, -2, 2 + j2\}$ .
- List the properties of DFT & explain circular convolution properties of DFT.
- Calculate 4 point DFT values of the sequence  $x(n) = \{0, 2, 4, 6\}$  using DIF, FFT Algorithm.

**Q.3 Answer any two questions.**

12

- Perform circular convolution of the following sequences  $x(n) = \{1, 2, 2, 1\}$  &  $h(n) = \{1, 2, 3, 4\}$  using DFT and IDFT method.
- Find DFT of the sequence  $x(n) = \{1, 4, 3, 5, 6, 3, 2, 3\}$  using FFT algorithm.
- Find linear convolution Using overlap save method, of the following sequence  $x(n) = \{1, 0, -3, 0, 2, 1, 0, -2, -1, 0, 1, 5, 7, 3\}$   $h(n) = \{2, 2, 1, 1\}$ .
- Find circular convolution of two finite duration sequence  $x(n) = \{1, -2, -2, 4, -1, 2\}$   $h(n) = \{1, 2, 3, 2\}$

**Section – II**

**Q.4 Answer the following questions.**

16

- Explain Fourier series method for designing FIR filter?
- Write a short note on Gibb's phenomenon.
- For analog transfer function  $H(s) = \frac{2}{(s+1)(s+2)}$   
 Determine  $H(Z)$  using bilinear transformation with  $T=1$  sec.
- Obtain the direct form-I & direct form-II realization for the system describe  $y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4x(n-1)$

**Q.5 Answer any two questions.**

- a) Convert the given analog transfer function into equivalent digital transfer function using impulse invariant transformation technique (T=1 second/sample)

$$H(s) = \frac{s + 0.1}{(s + 0.1)^2 + 25}$$

- b) Design an ideal lowpass filter with frequency response specifications as

$$H_d(e^{jw}) = 1 \quad \text{for } -\frac{\pi}{2} \leq w \leq \frac{\pi}{2}$$

$$= 0 \quad \text{for } \frac{\pi}{2} \leq |w| \leq \pi$$

Find the values of h(n) for N=11, also find H(Z).

- c) Explain the application of DSP in Audio Signal Processing.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following has linear phase?
  - a) IIR filter
  - b) LP filter
  - c) FIR filter
  - d) None
- 2) The frequency sampling structure are efficient because \_\_\_\_\_.
  - a) sample points are less
  - b) some sampled DFT coefficients are zero when filter is narrow band
  - c) some sampled values can be assumed zero
  - d) parallel structures are efficient
- 3) Advantage of FIR filter is \_\_\_\_\_.
  - a) they are always stable
  - b) less storage requirement
  - c) errors due to round off is less
  - d) None
- 4) The mapping of s-plane to z- plane in bilinear transformation is \_\_\_\_\_.
  - a)  $S = \frac{2}{3T} \left[ \frac{1-z^{-1}}{1+z^{-1}} \right]$
  - b)  $S = \frac{2}{T} \left[ \frac{1-z^{-1}}{1+z^{-1}} \right]$
  - c)  $S = \frac{2}{T} \left[ \frac{1+z^{-1}}{1-z^{-1}} \right]$
  - d) None
- 5) To avoid aliasing of frequency components which method is useful in designing filter \_\_\_\_\_.
  - a) impulse invariant
  - b) bilinear transformation
  - c) windowing techniques
  - d) None
- 6) The overall impulse response of two LTI systems connected in cascade is equal to \_\_\_\_\_.
  - a) Sum of two impulse response
  - b) Multiplication of two impulse response
  - c) Convolution of individual impulse response
  - d) None
- 7) In IIR system, which of the following structure will give direct relation between time domain and Z domain?
  - a) Direct form I
  - b) Direct form II
  - c) Cascade form
  - d) Parallel form



- 8) A necessary & sufficient condition for LTI system to be BIBO stable is \_\_\_\_\_.
  - a)  $\sum_{n=-\infty}^{\infty} h > \infty$
  - b)  $\sum_{n=-\infty}^{\infty} h(n) < \infty$
  - c)  $\sum_{n=-\infty}^{\infty} h(n) = \infty$
  - d) None
- 9) Correlation is basically used to \_\_\_\_\_.
  - a) Add two signals
  - b) Subtract two signals
  - c) Compare two signals
  - d) None
- 10) If the sequence  $x(n)$  is real & even the its corresponding DFT values are \_\_\_\_\_.
  - a) Imaginary and odd
  - b) Imaginary and even
  - c) Real and even
  - d) None
- 11) When a sequence is circularly shifted in time by 5 units, the magnitude response \_\_\_\_\_.
  - a) Increase by 5
  - b) Remain unchanged
  - c) Shift by 5 units
  - d) None
- 12) With zero padding DFT used as \_\_\_\_\_.
  - a) Circular filtering
  - b) Linear filtering
  - c) FFT calculations
  - d) Overlap add method
- 13) The circular convolution can be converted to linear convolution for sequence  $x(n)$  of length L and sequence  $h(n)$  of length M by \_\_\_\_\_.
  - a) making both sequence equal to  $L+M-1$
  - b) making both sequence equal to L or M
  - c) making both sequence equal to  $L+M+1$
  - d) None
- 14) Goertzel algorithm evaluates the \_\_\_\_\_.
  - a) DTFT coefficients
  - b) DFT coefficients
  - c) Z transform
  - d) FT coefficient

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Set Q
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Answer any four questions. 16**

- Compute auto correlation of the sequence  $x(n) = \{1, 2, 3, 4\}$
- The first 5 point of the 8 point DFT of a real valued sequence are  $\{28, -4 + j9.565, -4 + j4, -4 + j1.656, -4\}$  Determine the remaining 3 Points.
- Find IDFT of  $X(k) = \{50, 2 - j2, -2, 2 + j2\}$ .
- List the properties of DFT & explain circular convolution properties of DFT.
- Calculate 4 point DFT values of the sequence  $x(n) = \{0, 2, 4, 6\}$  using DIF, FFT Algorithm.

**Q.3 Answer any two questions. 12**

- Perform circular convolution of the following sequences  $x(n) = \{1, 2, 2, 1\}$  &  $h(n) = \{1, 2, 3, 4\}$  using DFT and IDFT method.
- Find DFT of the sequence  $x(n) = \{1, 4, 3, 5, 6, 3, 2, 3\}$  using FFT algorithm.
- Find linear convolution Using overlap save method, of the following sequence  $x(n) = \{1, 0, -3, 0, 2, 1, 0, -2, -1, 0, 1, 5, 7, 3\}$   $h(n) = \{2, 2, 1, 1\}$ .
- Find circular convolution of two finite duration sequence  $x(n) = \{1, -2, -2, 4, -1, 2\}$   $h(n) = \{1, 2, 3, 2\}$

**Section – II**

**Q.4 Answer the following questions. 16**

- Explain Fourier series method for designing FIR filter?
- Write a short note on Gibb's phenomenon.
- For analog transfer function  $H(s) = \frac{2}{(s+1)(s+2)}$   
 Determine  $H(Z)$  using bilinear transformation with  $T=1$  sec.
- Obtain the direct form-I & direct form-II realization for the system describe  $y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4x(n-1)$

**Q.5 Answer any two questions.**

- a) Convert the given analog transfer function into equivalent digital transfer function using impulse invariant transformation technique (T=1 second/sample)

$$H(s) = \frac{s + 0.1}{(s + 0.1)^2 + 25}$$

- b) Design an ideal lowpass filter with frequency response specifications as
- $$H_d(e^{jw}) = 1 \quad \text{for } -\frac{\pi}{2} \leq w \leq \frac{\pi}{2}$$
- $$= 0 \quad \text{for } \frac{\pi}{2} \leq |w| \leq \pi$$

Find the values of h(n) for N=11, also find H(Z).

- c) Explain the application of DSP in Audio Signal Processing.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) The mapping of s-plane to z- plane in bilinear transformation is \_\_\_\_\_.  
 a)  $S = \frac{2}{3T} \left[ \frac{1-z^{-1}}{1+z^{-1}} \right]$                       b)  $S = \frac{2}{T} \left[ \frac{1-z^{-1}}{1+z^{-1}} \right]$   
 c)  $S = \frac{2}{T} \left[ \frac{1+z^{-1}}{1-z^{-1}} \right]$                       d) None
- 2) To avoid aliasing of frequency components which method is useful in designing filter \_\_\_\_\_.  
 a) impulse invariant                      b) bilinear transformation  
 c) windowing techniques                      d) None
- 3) The overall impulse response of two LTI systems connected in cascade is equal to \_\_\_\_\_.  
 a) Sum of two impulse response  
 b) Multiplication of two impulse response  
 c) Convolution of individual impulse response  
 d) None
- 4) In IIR system, which of the following structure will give direct relation between time domain and Z domain?  
 a) Direct form I                      b) Direct form II  
 c) Cascade form                      d) Parallel form
- 5) A necessary & sufficient condition for LTI system to be BIBO stable is \_\_\_\_\_.  
 a)  $\sum_{n=-\infty}^{\infty} h > \infty$                       b)  $\sum_{n=-\infty}^{\infty} h(n) < \infty$   
 c)  $\sum_{n=-\infty}^{\infty} h(n) = \infty$                       d) None
- 6) Correlation is basically used to \_\_\_\_\_.  
 a) Add two signals                      b) Subtract two signals  
 c) Compare two signals                      d) None
- 7) If the sequence x(n) is real & even the its corresponding DFT values are \_\_\_\_\_.  
 a) Imaginary and odd                      b) Imaginary and even  
 c) Real and even                      d) None

- 8) When a sequence is circularly shifted in time by 5 units, the magnitude response \_\_\_\_\_.  
a) Increase by 5  
b) Remain unchanged  
c) Shift by 5 units  
d) None
- 9) With zero padding DFT used as \_\_\_\_\_.  
a) Circular filtering  
b) Linear filtering  
c) FFT calculations  
d) Overlap add method
- 10) The circular convolution can be converted to linear convolution for sequence  $x(n)$  of length  $L$  and sequence  $h(n)$  of length  $M$  by \_\_\_\_\_.  
a) making both sequence equal to  $L+M-1$   
b) making both sequence equal to  $L$  or  $M$   
c) making both sequence equal to  $L+M+1$   
d) None
- 11) Goertzel algorithm evaluates the \_\_\_\_\_.  
a) DTFT coefficients  
b) DFT coefficients  
c) Z transform  
d) FT coefficient
- 12) Which of the following has linear phase?  
a) IIR filter  
b) LP filter  
c) FIR filter  
d) None
- 13) The frequency sampling structure are efficient because \_\_\_\_\_.  
a) sample points are less  
b) some sampled DFT coefficients are zero when filter is narrow band  
c) some sampled values can be assumed zero  
d) parallel structures are efficient
- 14) Advantage of FIR filter is \_\_\_\_\_.  
a) they are always stable  
b) less storage requirement  
c) errors due to round off is less  
d) None

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Answer any four questions.**

**16**

- Compute auto correlation of the sequence  $x(n) = \{1, 2, 3, 4\}$
- The first 5 point of the 8 point DFT of a real valued sequence are  $\{28, -4 + j9.565, -4 + j4, -4 + j1.656, -4\}$  Determine the remaining 3 Points.
- Find IDFT of  $X(k) = \{50, 2 - j2, -2, 2 + j2\}$ .
- List the properties of DFT & explain circular convolution properties of DFT.
- Calculate 4 point DFT values of the sequence  $x(n) = \{0, 2, 4, 6\}$  using DIF, FFT Algorithm.

**Q.3 Answer any two questions.**

**12**

- Perform circular convolution of the following sequences  $x(n) = \{1, 2, 2, 1\}$  &  $h(n) = \{1, 2, 3, 4\}$  using DFT and IDFT method.
- Find DFT of the sequence  $x(n) = \{1, 4, 3, 5, 6, 3, 2, 3\}$  using FFT algorithm.
- Find linear convolution Using overlap save method, of the following sequence  $x(n) = \{1, 0, -3, 0, 2, 1, 0, -2, -1, 0, 1, 5, 7, 3\}$   $h(n) = \{2, 2, 1, 1\}$ .
- Find circular convolution of two finite duration sequence  $x(n) = \{1, -2, -2, 4, -1, 2\}$   $h(n) = \{1, 2, 3, 2\}$

**Section – II**

**Q.4 Answer the following questions.**

**16**

- Explain Fourier series method for designing FIR filter?
- Write a short note on Gibb's phenomenon.
- For analog transfer function  $H(s) = \frac{2}{(s+1)(s+2)}$   
 Determine  $H(Z)$  using bilinear transformation with  $T=1$  sec.
- Obtain the direct form-I & direct form-II realization for the system describe  $y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4x(n-1)$

**Q.5 Answer any two questions.**

- a) Convert the given analog transfer function into equivalent digital transfer function using impulse invariant transformation technique (T=1 second/sample)

$$H(s) = \frac{s + 0.1}{(s + 0.1)^2 + 25}$$

- b) Design an ideal lowpass filter with frequency response specifications as
- $$H_d(e^{jw}) = 1 \quad \text{for } -\frac{\pi}{2} \leq w \leq \frac{\pi}{2}$$
- $$= 0 \quad \text{for } \frac{\pi}{2} \leq |w| \leq \pi$$

Find the values of h(n) for N=11, also find H(Z).

- c) Explain the application of DSP in Audio Signal Processing.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The circular convolution can be converted to linear convolution for sequence  $x(n)$  of length  $L$  and sequence  $h(n)$  of length  $M$  by \_\_\_\_\_.  
 a) making both sequence equal to  $L+M-1$   
 b) making both sequence equal to  $L$  or  $M$   
 c) making both sequence equal to  $L+M+1$   
 d) None
- 2) Goertzel algorithm evaluates the \_\_\_\_\_.  
 a) DTFT coefficients                      b) DFT coefficients  
 c) Z transform                              d) FT coefficient
- 3) Which of the following has linear phase?  
 a) IIR filter                                      b) LP filter  
 c) FIR filter                                      d) None
- 4) The frequency sampling structure are efficient because \_\_\_\_\_.  
 a) sample points are less  
 b) some sampled DFT coefficients are zero when filter is narrow band  
 c) some sampled values can be assumed zero  
 d) parallel structures are efficient
- 5) Advantage of FIR filter is \_\_\_\_\_.  
 a) they are always stable                      b) less storage requirement  
 c) errors due to round off is less              d) None
- 6) The mapping of s-plane to z- plane in bilinear transformation is \_\_\_\_\_.  
 a)  $S = \frac{2}{3T} \left[ \frac{1-z^{-1}}{1+z^{-1}} \right]$                       b)  $S = \frac{2}{T} \left[ \frac{1-z^{-1}}{1+z^{-1}} \right]$   
 c)  $S = \frac{2}{T} \left[ \frac{1+z^{-1}}{1-z^{-1}} \right]$                       d) None
- 7) To avoid aliasing of frequency components which method is useful in designing filter \_\_\_\_\_.  
 a) impulse invariant                              b) bilinear transformation  
 c) windowing techniques                      d) None



- 8) The overall impulse response of two LTI systems connected in cascade is equal to \_\_\_\_\_.  
a) Sum of two impulse response  
b) Multiplication of two impulse response  
c) Convolution of individual impulse response  
d) None
- 9) In IIR system, which of the following structure will give direct relation between time domain and Z domain?  
a) Direct form I  
b) Direct form II  
c) Cascade form  
d) Parallel form
- 10) A necessary & sufficient condition for LTI system to be BIBO stable is \_\_\_\_\_.  
a)  $\sum_{n=-\infty}^{\infty} h > \infty$   
b)  $\sum_{n=-\infty}^{\infty} h(n) < \infty$   
c)  $\sum_{n=-\infty}^{\infty} h(n) = \infty$   
d) None
- 11) Correlation is basically used to \_\_\_\_\_.  
a) Add two signals  
b) Subtract two signals  
c) Compare two signals  
d) None
- 12) If the sequence  $x(n)$  is real & even the its corresponding DFT values are \_\_\_\_\_.  
a) Imaginary and odd  
b) Imaginary and even  
c) Real and even  
d) None
- 13) When a sequence is circularly shifted in time by 5 units, the magnitude response \_\_\_\_\_.  
a) Increase by 5  
b) Remain unchanged  
c) Shift by 5 units  
d) None
- 14) With zero padding DFT used as \_\_\_\_\_.  
a) Circular filtering  
b) Linear filtering  
c) FFT calculations  
d) Overlap add method

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Set	S
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** All questions are compulsory.

**Section – I**

**Q.2 Answer any four questions. 16**

- Compute auto correlation of the sequence  $x(n) = \{1, 2, 3, 4\}$
- The first 5 point of the 8 point DFT of a real valued sequence are  $\{28, -4 + j9.565, -4 + j4, -4 + j1.656, -4\}$  Determine the remaining 3 Points.
- Find IDFT of  $X(k) = \{50, 2 - j2, -2, 2 + j2\}$ .
- List the properties of DFT & explain circular convolution properties of DFT.
- Calculate 4 point DFT values of the sequence  $x(n) = \{0, 2, 4, 6\}$  using DIF, FFT Algorithm.

**Q.3 Answer any two questions. 12**

- Perform circular convolution of the following sequences  $x(n) = \{1, 2, 2, 1\}$  &  $h(n) = \{1, 2, 3, 4\}$  using DFT and IDFT method.
- Find DFT of the sequence  $x(n) = \{1, 4, 3, 5, 6, 3, 2, 3\}$  using FFT algorithm.
- Find linear convolution Using overlap save method, of the following sequence  $x(n) = \{1, 0, -3, 0, 2, 1, 0, -2, -1, 0, 1, 5, 7, 3\}$   $h(n) = \{2, 2, 1, 1\}$ .
- Find circular convolution of two finite duration sequence  $x(n) = \{1, -2, -2, 4, -1, 2\}$   $h(n) = \{1, 2, 3, 2\}$

**Section – II**

**Q.4 Answer the following questions. 16**

- Explain Fourier series method for designing FIR filter?
- Write a short note on Gibb's phenomenon.
- For analog transfer function  $H(s) = \frac{2}{(s+1)(s+2)}$   
 Determine  $H(Z)$  using bilinear transformation with  $T=1$  sec.
- Obtain the direct form-I & direct form-II realization for the system describe  $y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4x(n-1)$

**Q.5 Answer any two questions.**

- a) Convert the given analog transfer function into equivalent digital transfer function using impulse invariant transformation technique (T=1 second/sample)

$$H(s) = \frac{s + 0.1}{(s + 0.1)^2 + 25}$$

- b) Design an ideal lowpass filter with frequency response specifications as
- $$H_d(e^{jw}) = 1 \quad \text{for } -\frac{\pi}{2} \leq w \leq \frac{\pi}{2}$$
- $$= 0 \quad \text{for } \frac{\pi}{2} \leq |w| \leq \pi$$

Find the values of h(n) for N=11, also find H(Z).

- c) Explain the application of DSP in Audio Signal Processing.

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Set **P**

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The principle reasons behind economic problems \_\_\_\_\_.  
 a) Unlimited wants  
 b) Limited or Scarce of Means  
 c) Alternatives Uses of Means  
 d) All of the above
- 2) \_\_\_\_\_ is economic theory used in business whereas \_\_\_\_\_ is economics theory used in business and non-business organization.  
 a) Micro economics, macro economics  
 b) Business economics, managerial economics  
 c) Positive economics and normative economics  
 d) None of these
- 3) Demand curve slopes downwards because of \_\_\_\_\_.  
 a) The law of diminishing marginal utility  
 b) The income effect  
 c) Substitution effect  
 d) All of the above
- 4) Basic assumptions of law of demand include \_\_\_\_\_.  
 a) Prices of other goods should change  
 b) There should be substitute for the commodity  
 c) The commodity should not confer any distinction  
 d) The demand for the commodity should not be continuous
- 5) \_\_\_\_\_ is the degree of responsiveness of supply to changes in the price of a good.  
 a) Elasticity of demand  
 b) Elasticity of supply  
 c) Both (a) & (b)  
 d) None of them
- 6) In the case of perfect elasticity, the demand curve is \_\_\_\_\_.  
 a) Vertical  
 b) Horizontal  
 c) Flat  
 d) Steep
- 7) Cross elasticity of demand between tea and sugar is \_\_\_\_\_.  
 a) Positive  
 b) Zero  
 c) Infinity  
 d) Negative

- 8) Which of the following is not a survey method of demand forecasting?
- a) Consumers interview method      b) Expert opinion method
  - c) Barometric method                  d) Collective opinion method
- 9) The law of diminishing returns states that:
- a) As a firm uses more of a variable resource, given the quantity of fixed resources, the average product of the firm will increase.
  - b) As a firm uses more of a variable resource, given the quantity of fixed resources, marginal product of the firm will eventually decrease.
  - c) In the short run, the average total costs of the firm will eventually diminish.
  - d) In the long run, the average total costs of the firm will eventually diminish.
- 10) Implicit costs are:
- a) Equal to total fixed costs.
  - b) Comprised entirely of variable costs.
  - c) "payments" for self-employed resources.
  - d) always greater in the short run than in the long run.
- 11) In a perfectly competitive market, individual firm \_\_\_\_.
- a) Cannot influence the price of its product
  - b) Can influence the price of its product
  - c) Can fix the price of its product
  - d) Can influence the market force
- 12) The product under monopolistic competition are \_\_\_\_.
- a) Differentiated with close substitute
  - b) Perfect substitute
  - c) Differentiated without close substitute
  - d) Homogeneous
- 13) Fixed cost per unit increases when \_\_\_\_.
- a) Volume of production decreases
  - b) Volume of production increases
  - c) Variable cost per unit decreases
  - d) None of these
- 14) Firms in an oligopoly \_\_\_\_.
- a) Are independent of each other's action
  - b) Can each influence the market price
  - c) Charge a price equal to marginal revenue
  - d) All of these

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**Set****P**

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Explain the significance and limitations of Managerial Economics.
- b) Explain the following terms
  - 1) Microeconomics
  - 2) Macroeconomics
- c) State and explain the law of demand and law of supply
- d) What is Price Elasticity? State and explain the factors affecting Price Elasticity.
- e) Explain the concept of cross price elasticity.

**Q.3 Solve Any Two.** **12**

- a) Explain the scope and nature of Managerial Economics.
- b) State and explain the determinants of demand.
- c) Explain Elasticity of Supply? State the factors affecting elasticity of supply.

**Section – II**

**Q.4 Solve any four.** **16**

- a) What are the objectives of demand forecasting?
- b) Explain Trend projection method of demand forecasting.
- c) What do you mean by production? Explain the concept of production function.
- d) State and explain characteristics of market structure.
- e) Explain different market structures.

**Q.5 Solve Any Two.** **12**

- a) What is Linear programming? Explain applications of Linear programming.
- b) Explain break even analysis in detail. What is profit margin of safety.
- c) What is Pricing? Explain pricing decisions under perfect competition.

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not a survey method of demand forecasting?
  - a) Consumers interview method      b) Expert opinion method
  - c) Barometric method                  d) Collective opinion method
- 2) The law of diminishing returns states that:
  - a) As a firm uses more of a variable resource, given the quantity of fixed resources, the average product of the firm will increase.
  - b) As a firm uses more of a variable resource, given the quantity of fixed resources, marginal product of the firm will eventually decrease.
  - c) In the short run, the average total costs of the firm will eventually diminish.
  - d) In the long run, the average total costs of the firm will eventually diminish.
- 3) Implicit costs are:
  - a) Equal to total fixed costs.
  - b) Comprised entirely of variable costs.
  - c) "payments" for self-employed resources.
  - d) always greater in the short run than in the long run.
- 4) In a perfectly competitive market, individual firm \_\_\_\_\_.
  - a) Cannot influence the price of its product
  - b) Can influence the price of its product
  - c) Can fix the price of its product
  - d) Can influence the market force
- 5) The product under monopolistic competition are \_\_\_\_\_.
  - a) Differentiated with close substitute
  - b) Perfect substitute
  - c) Differentiated without close substitute
  - d) Homogeneous

- 6) Fixed cost per unit increases when \_\_\_\_\_.  
a) Volume of production decreases  
b) Volume of production increases  
c) Variable cost per unit decreases  
d) None of these
- 7) Firms in an oligopoly \_\_\_\_\_.  
a) Are independent of each other's action  
b) Can each influence the market price  
c) Charge a price equal to marginal revenue  
d) All of these
- 8) The principle reasons behind economic problems \_\_\_\_\_.  
a) Unlimited wants  
b) Limited or Scarce of Means  
c) Alternatives Uses of Means  
d) All of the above
- 9) \_\_\_\_\_ is economic theory used in business whereas \_\_\_\_\_ is economics theory used in business and non-business organization.  
a) Micro economics, macro economics  
b) Business economics, managerial economics  
c) Positive economics and normative economics  
d) None of these
- 10) Demand curve slopes downwards because of \_\_\_\_\_.  
a) The law of diminishing marginal utility  
b) The income effect  
c) Substitution effect  
d) All of the above
- 11) Basic assumptions of law of demand include \_\_\_\_\_.  
a) Prices of other goods should change  
b) There should be substitute for the commodity  
c) The commodity should not confer any distinction  
d) The demand for the commodity should not be continuous
- 12) \_\_\_\_\_ is the degree of responsiveness of supply to changes in the price of a good.  
a) Elasticity of demand  
b) Elasticity of supply  
c) Both (a) & (b)  
d) None of them
- 13) In the case of perfect elasticity, the demand curve is \_\_\_\_\_.  
a) Vertical  
b) Horizontal  
c) Flat  
d) Steep
- 14) Cross elasticity of demand between tea and sugar is \_\_\_\_\_.  
a) Positive  
b) Zero  
c) Infinity  
d) Negative



<b>Seat No.</b>	
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**Set Q**

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Explain the significance and limitations of Managerial Economics.
- b) Explain the following terms
  - 1) Microeconomics
  - 2) Macroeconomics
- c) State and explain the law of demand and law of supply
- d) What is Price Elasticity? State and explain the factors affecting Price Elasticity.
- e) Explain the concept of cross price elasticity.

**Q.3 Solve Any Two.** **12**

- a) Explain the scope and nature of Managerial Economics.
- b) State and explain the determinants of demand.
- c) Explain Elasticity of Supply? State the factors affecting elasticity of supply.

**Section – II**

**Q.4 Solve any four.** **16**

- a) What are the objectives of demand forecasting?
- b) Explain Trend projection method of demand forecasting.
- c) What do you mean by production? Explain the concept of production function.
- d) State and explain characteristics of market structure.
- e) Explain different market structures.

**Q.5 Solve Any Two.** **12**

- a) What is Linear programming? Explain applications of Linear programming.
- b) Explain break even analysis in detail. What is profit margin of safety.
- c) What is Pricing? Explain pricing decisions under perfect competition.

Seat No.	
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Set R
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In a perfectly competitive market, individual firm \_\_\_\_\_.  
 a) Cannot influence the price of its product  
 b) Can influence the price of its product  
 c) Can fix the price of its product  
 d) Can influence the market force
- 2) The product under monopolistic competition are \_\_\_\_\_.  
 a) Differentiated with close substitute  
 b) Perfect substitute  
 c) Differentiated without close substitute  
 d) Homogeneous
- 3) Fixed cost per unit increases when \_\_\_\_\_.  
 a) Volume of production decreases  
 b) Volume of production increases  
 c) Variable cost per unit decreases  
 d) None of these
- 4) Firms in an oligopoly \_\_\_\_\_.  
 a) Are independent of each other's action  
 b) Can each influence the market price  
 c) Charge a price equal to marginal revenue  
 d) All of these
- 5) The principle reasons behind economic problems \_\_\_\_\_.  
 a) Unlimited wants  
 b) Limited or Scarce of Means  
 c) Alternatives Uses of Means  
 d) All of the above
- 6) \_\_\_\_\_ is economic theory used in business whereas \_\_\_\_\_ is economics theory used in business and non-business organization.  
 a) Micro economics, macro economics  
 b) Business economics, managerial economics  
 c) Positive economics and normative economics  
 d) None of these

- 7) Demand curve slopes downwards because of \_\_\_\_\_.  
a) The law of diminishing marginal utility  
b) The income effect  
c) Substitution effect  
d) All of the above
- 8) Basic assumptions of law of demand include \_\_\_\_\_.  
a) Prices of other goods should change  
b) There should be substitute for the commodity  
c) The commodity should not confer any distinction  
d) The demand for the commodity should not be continuous
- 9) \_\_\_\_\_ is the degree of responsiveness of supply to changes in the price of a good.  
a) Elasticity of demand  
b) Elasticity of supply  
c) Both (a) & (b)  
d) None of them
- 10) In the case of perfect elasticity, the demand curve is \_\_\_\_\_.  
a) Vertical  
b) Horizontal  
c) Flat  
d) Steep
- 11) Cross elasticity of demand between tea and sugar is \_\_\_\_\_.  
a) Positive  
b) Zero  
c) Infinity  
d) Negative
- 12) Which of the following is not a survey method of demand forecasting?  
a) Consumers interview method  
b) Expert opinion method  
c) Barometric method  
d) Collective opinion method
- 13) The law of diminishing returns states that:  
a) As a firm uses more of a variable resource, given the quantity of fixed resources, the average product of the firm will increase.  
b) As a firm uses more of a variable resource, given the quantity of fixed resources, marginal product of the firm will eventually decrease.  
c) In the short run, the average total costs of the firm will eventually diminish.  
d) In the long run, the average total costs of the firm will eventually diminish.
- 14) Implicit costs are:  
a) Equal to total fixed costs.  
b) Comprised entirely of variable costs.  
c) "payments" for self-employed resources.  
d) always greater in the short run than in the long run.

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Explain the significance and limitations of Managerial Economics.
- b) Explain the following terms
  - 1) Microeconomics
  - 2) Macroeconomics
- c) State and explain the law of demand and law of supply
- d) What is Price Elasticity? State and explain the factors affecting Price Elasticity.
- e) Explain the concept of cross price elasticity.

**Q.3 Solve Any Two.** **12**

- a) Explain the scope and nature of Managerial Economics.
- b) State and explain the determinants of demand.
- c) Explain Elasticity of Supply? State the factors affecting elasticity of supply.

**Section – II**

**Q.4 Solve any four.** **16**

- a) What are the objectives of demand forecasting?
- b) Explain Trend projection method of demand forecasting.
- c) What do you mean by production? Explain the concept of production function.
- d) State and explain characteristics of market structure.
- e) Explain different market structures.

**Q.5 Solve Any Two.** **12**

- a) What is Linear programming? Explain applications of Linear programming.
- b) Explain break even analysis in detail. What is profit margin of safety.
- c) What is Pricing? Explain pricing decisions under perfect competition.

# S

- 7) The product under monopolistic competition are \_\_\_\_\_.  
a) Differentiated with close substitute  
b) Perfect substitute  
c) Differentiated without close substitute  
d) Homogeneous
- 8) Fixed cost per unit increases when \_\_\_\_\_.  
a) Volume of production decreases  
b) Volume of production increases  
c) Variable cost per unit decreases  
d) None of these
- 9) Firms in an oligopoly \_\_\_\_\_.  
a) Are independent of each other's action  
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a) Unlimited wants  
b) Limited or Scarce of Means  
c) Alternatives Uses of Means  
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a) Micro economics, macro economics  
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a) Prices of other goods should change  
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c) The commodity should not confer any distinction  
d) The demand for the commodity should not be continuous
- 14) \_\_\_\_\_ is the degree of responsiveness of supply to changes in the price of a good.  
a) Elasticity of demand  
b) Elasticity of supply  
c) Both (a) & (b)  
d) None of them

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Explain the significance and limitations of Managerial Economics.
- b) Explain the following terms
  - 1) Microeconomics
  - 2) Macroeconomics
- c) State and explain the law of demand and law of supply
- d) What is Price Elasticity? State and explain the factors affecting Price Elasticity.
- e) Explain the concept of cross price elasticity.

**Q.3 Solve Any Two.** **12**

- a) Explain the scope and nature of Managerial Economics.
- b) State and explain the determinants of demand.
- c) Explain Elasticity of Supply? State the factors affecting elasticity of supply.

**Section – II**

**Q.4 Solve any four.** **16**

- a) What are the objectives of demand forecasting?
- b) Explain Trend projection method of demand forecasting.
- c) What do you mean by production? Explain the concept of production function.
- d) State and explain characteristics of market structure.
- e) Explain different market structures.

**Q.5 Solve Any Two.** **12**

- a) What is Linear programming? Explain applications of Linear programming.
- b) Explain break even analysis in detail. What is profit margin of safety.
- c) What is Pricing? Explain pricing decisions under perfect competition.

<b>Seat No.</b>	
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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

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Set	P
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Project Management and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- Explain Project Life Cycle concept.
- Explain PERT.
- What is Top down and bottoms up budgeting?
- What is Risk? What are its categories?
- Differentiate Qualitative & Quantitative risk assessment.

**Q.3 Solve any two of the following.** **12**

- What are the various stages in project planning & explain.
- Explain Case study on visualization process of GANTT Chart.
- What is Risk Identification? Explain in detail about Risk Register.

**Section – II**

**Q.4 Solve any four of the following.** **16**

**Note:** Question e is compulsory.

- Write in brief on application of OR in Industry.
- What is LPP give its Applications & Advantages of LPP
- A firm produces three products, these products are processed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of the three machines are given in the table below.

Machine	Time per unit (minutes)			Machine Capacity (Min/day)
	Product 1	Product 2	Product 3	
M1	2	3	2	440
M2	4	-	3	470
M3	2	5		430

It is required to determine the daily no. of units to be manufactured for each product. The profit per unit for product 1, 2 and 3 is, Rs 4, Rs 3 and Rs 6 respectively. It is assumed that all the amounts produced are consumed in the market. Formulate the mathematical (LP) model that will maximize the daily profit.

- Solve the following by Graphical method.

$$\text{Minimize } Z = 2X_1 + 3X_2$$

$$\text{Subject to } X_1 + X_2 \geq 6$$

$$7X_1 + X_2 \geq 14, X_1 \text{ \& } X_2 \geq 0$$

Compute the coordinates to plot on the  $X_1, X_2$  Plane

- What are the factors that influence the selection of location for plant?

**Q.5 Solve any two of the following.****Note:** Question c is compulsory.

- a) What is Replacement Model? State it's need & explain categories of replacement problems.
- b) What is Operational Research? Explain in brief the models of Operational Research.
- c) Consider the assignment problem as shown in table. In this problem 5 different jobs are to be assigned to five different operators such that the total processing time is minimized. The matrix entries represent processing time in hours. Solve using Hungarian method the matrix entries represent the processing time in hours.

Job	Operator				
	A	B	C	D	E
1	10	12	15	12	8
2	7	16	14	14	11
3	13	14	7	9	9
4	12	10	11	13	10
5	8	13	15	11	15

<b>Seat No.</b>	
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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- Page 5 of 16

- 9) The Gantt chart is used for \_\_\_\_\_.  
a) Tracking project progress  
b) Knowing date of project  
c) Knowing starting date of project  
d) Knowing end date of project
- 10) Generating new ideas for increasing the customer demands is \_\_\_\_\_.  
a) Innovation  
b) Directing  
c) Controlling  
d) Staffing
- 11) Which of the following risks are derived from the software or hardware technologies that are used to develop the system?  
a) Managerial risks  
b) Technology risks  
c) Estimation risks  
d) Organizational risks
- 12) Organizing is \_\_\_\_\_.  
a) separation of activities  
b) grouping of activities  
c) None  
d) all above
- 13) Which technique is used in finding a solution for optimizing a given objective, such as profit maximization or cost reduction under certain constraints?  
a) Quailing Theory  
b) Waiting Line  
c) Both a and b  
d) Linear Programming
- 14) What is a work breakdown structure?  
a) A list of the activities making up the higher levels of the project  
b) A definition of the hierarchy of project tasks, subtasks, and work packages  
c) A depiction of the activities making up a project  
d) A structure that is incompatible with the Critical Path Method

Seat No.	
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Set **Q**

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Project Management and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- Explain Project Life Cycle concept.
- Explain PERT.
- What is Top down and bottoms up budgeting?
- What is Risk? What are its categories?
- Differentiate Qualitative & Quantitative risk assessment.

**Q.3 Solve any two of the following.** **12**

- What are the various stages in project planning & explain.
- Explain Case study on visualization process of GANTT Chart.
- What is Risk Identification? Explain in detail about Risk Register.

**Section – II**

**Q.4 Solve any four of the following.** **16**

**Note:** Question e is compulsory.

- Write in brief on application of OR in Industry.
- What is LPP give its Applications & Advantages of LPP
- A firm produces three products, these products are processed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of the three machines are given in the table below.

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It is required to determine the daily no. of units to be manufactured for each product. The profit per unit for product 1, 2 and 3 is, Rs 4, Rs 3 and Rs 6 respectively. It is assumed that all the amounts produced are consumed in the market. Formulate the mathematical (LP) model that will maximize the daily profit.

- Solve the following by Graphical method.

$$\text{Minimize } Z = 2X_1 + 3X_2$$

$$\text{Subject to } X_1 + X_2 \geq 6$$

$$7X_1 + X_2 \geq 14, X_1 \text{ \& } X_2 \geq 0$$

Compute the coordinates to plot on the  $X_1, X_2$  Plane

- What are the factors that influence the selection of location for plant?

**Q.5 Solve any two of the following.****Note:** Question c is compulsory.

- a) What is Replacement Model? State it's need & explain categories of replacement problems.
- b) What is Operational Research? Explain in brief the models of Operational Research.
- c) Consider the assignment problem as shown in table. In this problem 5 different jobs are to be assigned to five different operators such that the total processing time is minimized. The matrix entries represent processing time in hours. Solve using Hungarian method the matrix entries represent the processing time in hours.

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	A	B	C	D	E
1	10	12	15	12	8
2	7	16	14	14	11
3	13	14	7	9	9
4	12	10	11	13	10
5	8	13	15	11	15

<b>Seat No.</b>	
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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- Page 9 of 16



- 10)** Which technique is used in finding a solution for optimizing a given objective, such as profit maximization or cost reduction under certain constraints?
- a) Quailing Theory
  - b) Waiting Line
  - c) Both a and b
  - d) Linear Programming
- 11)** What is a work breakdown structure?
- a) A list of the activities making up the higher levels of the project
  - b) A definition of the hierarchy of project tasks, subtasks, and work packages
  - c) A depiction of the activities making up a project
  - d) A structure that is incompatible with the Critical Path Method
- 12)** For solving an assignment problem which method is used \_\_\_\_.
- a) Hungarian
  - b) American
  - c) German
  - d) None
- 13)** What is PERT analysis based on?
- a) Optimistic time
  - b) Pessimistic time
  - c) Most likely time
  - d) All of the above
- 14)** A risk response strategy used under tool of Strategies for negative Risks or Threats through which the project team decides to acknowledge the risk and not take any action unless the risk occurs is called \_\_\_\_.
- a) Mitigate
  - b) Transfer
  - c) Accept
  - d) Avoid

Seat No.	
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Set	R
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Project Management and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- Explain Project Life Cycle concept.
- Explain PERT.
- What is Top down and bottoms up budgeting?
- What is Risk? What are its categories?
- Differentiate Qualitative & Quantitative risk assessment.

**Q.3 Solve any two of the following.** **12**

- What are the various stages in project planning & explain.
- Explain Case study on visualization process of GANTT Chart.
- What is Risk Identification? Explain in detail about Risk Register.

**Section – II**

**Q.4 Solve any four of the following.** **16**

**Note:** Question e is compulsory.

- Write in brief on application of OR in Industry.
- What is LPP give its Applications & Advantages of LPP
- A firm produces three products, these products are processed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of the three machines are given in the table below.

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It is required to determine the daily no. of units to be manufactured for each product. The profit per unit for product 1, 2 and 3 is, Rs 4, Rs 3 and Rs 6 respectively. It is assumed that all the amounts produced are consumed in the market. Formulate the mathematical (LP) model that will maximize the daily profit.

- Solve the following by Graphical method.

$$\text{Minimize } Z = 2X_1 + 3X_2$$

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$$7X_1 + X_2 \geq 14, X_1 \text{ \& } X_2 \geq 0$$

Compute the coordinates to plot on the  $X_1, X_2$  Plane

- What are the factors that influence the selection of location for plant?

**Q.5 Solve any two of the following.****Note:** Question c is compulsory.

- a) What is Replacement Model? State its need & explain categories of replacement problems.
- b) What is Operational Research? Explain in brief the models of Operational Research.
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Seat No.	
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Set	S
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Project Management and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which technique is used in finding a solution for optimizing a given objective, such as profit maximization or cost reduction under certain constraints?
  - a) Quailing Theory
  - b) Waiting Line
  - c) Both a and b
  - d) Linear Programming
- 2) What is a work breakdown structure?
  - a) A list of the activities making up the higher levels of the project
  - b) A definition of the hierarchy of project tasks, subtasks, and work packages
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  - b) American
  - c) German
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- 4) What is PERT analysis based on?
  - a) Optimistic time
  - b) Pessimistic time
  - c) Most likely time
  - d) All of the above
- 5) A risk response strategy used under tool of Strategies for negative Risks or Threats through which the project team decides to acknowledge the risk and not take any action unless the risk occurs is called \_\_\_\_\_.
  - a) Mitigate
  - b) Transfer
  - c) Accept
  - d) Avoid
- 6) Operations Research has the characteristics it is done by a team of \_\_\_\_\_.
  - a) Scientists
  - b) Mathematicians
  - c) Academics
  - d) All of the above
- 7) \_\_\_\_\_ are the representation of reality.
  - a) Models
  - b) Phases
  - c) Both A and B
  - d) None of the above

- 8) In simplex method, if there is tie between a decision variable and a slack (or surplus) variable, \_\_\_\_\_ should be selected.
- a) Slack variable
  - b) Surplus variable
  - c) Decision variable
  - d) None of the above
- 9) In graphical representation the bounded region is known as \_\_\_\_\_ region.
- a) solution
  - b) basic solution
  - c) feasible solution
  - d) optimal solution
- 10) Project is \_\_\_\_\_.
- a) task
  - b) activity
  - c) planned activity
  - d) process
- 11) The Gantt chart is used for \_\_\_\_\_.
- a) Tracking project progress
  - b) Knowing date of project
  - c) Knowing starting date of project
  - d) Knowing end date of project
- 12) Generating new ideas for increasing the customer demands is \_\_\_\_\_.
- a) Innovation
  - b) Directing
  - c) Controlling
  - d) Staffing
- 13) Which of the following risks are derived from the software or hardware technologies that are used to develop the system?
- a) Managerial risks
  - b) Technology risks
  - c) Estimation risks
  - d) Organizational risks
- 14) Organizing is \_\_\_\_\_.
- a) separation of activities
  - b) grouping of activities
  - c) None
  - d) all above

Seat No.	
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Set **S**

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Project Management and Operation Research**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- Explain Project Life Cycle concept.
- Explain PERT.
- What is Top down and bottoms up budgeting?
- What is Risk? What are its categories?
- Differentiate Qualitative & Quantitative risk assessment.

**Q.3 Solve any two of the following.** **12**

- What are the various stages in project planning & explain.
- Explain Case study on visualization process of GANTT Chart.
- What is Risk Identification? Explain in detail about Risk Register.

**Section – II**

**Q.4 Solve any four of the following.** **16**

**Note:** Question e is compulsory.

- Write in brief on application of OR in Industry.
- What is LPP give its Applications & Advantages of LPP
- A firm produces three products, these products are processed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of the three machines are given in the table below.

Machine	Time per unit (minutes)			Machine Capacity (Min/day)
	Product 1	Product 2	Product 3	
M1	2	3	2	440
M2	4	-	3	470
M3	2	5		430

It is required to determine the daily no. of units to be manufactured for each product. The profit per unit for product 1, 2 and 3 is, Rs 4, Rs 3 and Rs 6 respectively. It is assumed that all the amounts produced are consumed in the market. Formulate the mathematical (LP) model that will maximize the daily profit.

- d)** Solve the following by Graphical method.

$$\text{Minimize } Z = 2X_1 + 3X_2$$

$$\text{Subject to } X_1 + X_2 \geq 6$$

$$7X_1 + X_2 \geq 14, X_1 \text{ \& } X_2 \geq 0$$

Compute the coordinates to plot on the  $X_1, X_2$  Plane

- e)** What are the factors that influence the selection of location for plant?

**Q.5 Solve any two of the following.****Note:** Question c is compulsory.

- a) What is Replacement Model? State it's need & explain categories of replacement problems.
- b) What is Operational Research? Explain in brief the models of Operational Research.
- c) Consider the assignment problem as shown in table. In this problem 5 different jobs are to be assigned to five different operators such that the total processing time is minimized. The matrix entries represent processing time in hours. Solve using Hungarian method the matrix entries represent the processing time in hours.

Job	Operator				
	A	B	C	D	E
1	10	12	15	12	8
2	7	16	14	14	11
3	13	14	7	9	9
4	12	10	11	13	10
5	8	13	15	11	15

Seat No.	
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Set **P**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If a machine can change its course of action based on the external environment on its own, the machine is called?
  - a) Mobile
  - b) Intelligent
  - c) Both a) and b)
  - d) None of the above
- 2) The "Father of Artificial Intelligence" is \_\_\_\_\_.
  - a) Alan Turing
  - b) Charles Babbage
  - c) John McCarthy
  - d) None of the above
- 3) Which of the following are heuristic search algorithms?
  - a) Best First Search Algorithm
  - b) A\*Search Algorithm
  - c) Both a) and b)
  - d) None of the above
- 4) Which of the following is the common language for Artificial Intelligence?
  - a) Python
  - b) Java
  - c) Lisp
  - d) PHP
- 5) Which of the following is a type of artificial intelligence agent?
  - a) Learning AI Agent
  - b) Simple Reflex AI Agent
  - c) Goal-Based AI Agent
  - d) All of the above
- 6) Which of the following are appropriate levels for a knowledge- based AI agent?
  - a) Knowledge Level
  - b) Logical Level
  - c) Implementation Level
  - d) All of the above
- 7) Decisions of Victory/Defeat are made in Game trees using which algorithm?
  - a) DFS
  - b) BFS
  - c) Heuristic Search
  - d) Min/Max Algorithm
- 8) What are the different types of Artificial Intelligence approaches?
  - a) Strong Approach
  - b) Weak Approach
  - c) Applied Approach
  - d) All of the above



- 9)** How an AI agent does interact with its environment?
- a) Using sensors and perceivers      b) Using only sensors
  - c) Using only perceivers              d) None of the above
- 10)** The correct ways to solve a problem of state-space search are?
- a) Forward from the initial state      b) Backward from the goal
  - c) Both a) and b)                      d) None of the above
- 11)** Out of the given options, which of the following algorithms uses the least memory?
- a) DFS                                      b) BFS
  - c) Both a) and b) are the same      d) Cannot be compared
- 12)** What is the work of Task Environment and Rational Agents?
- a) Problem and Solution              b) Solution and Problem
  - c) Observation and Problem          d) Observation and Solution
- 13)** How is a decision reached upon by a decision tree?
- a) No test                                  b) Single Test
  - c) Double Test                          d) Multiple sequences of tests
- 14)** The different types of machine learning are?
- a) Supervised                              b) Unsupervised
  - c) Reinforcement                      d) All of the above

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR questions.** **16**

- a) Explain AO\* Search Algorithm with example.
- b) Define Artificial Intelligence and what are the Applications of AI?
- c) State & explain different types of Agents.
- d) Write short notes.
  - 1) Description logics
  - 2) Situation calculus
- e) Differentiate Informed & Uninformed search.

**Q.3 Solve any TWO questions.** **12**

- a) Explain Heuristic Search Algorithm with example.
- b) What is Knowledge based system? Explain First Order Logic in details.
- c) State Different types of uniformed search algorithm. Explain any one in details along with advantages & disadvantages.

**Section – II**

**Q.4 Solve any FOUR questions.** **16**

- a) Write a note on Bayesian Network.
- b) Explain in detail about conditional Probability.
- c) What is elementary game theory? Explain with example.
- d) What is Utility Theory? How it will become helpful for talking decision?
- e) Describe the issues in knowledge representation.

**Q.5 Solve any TWO questions.** **12**

- a) Explain Decision Tree in details with one example.
- b) Explain Probability and Bayes' theorem along with example.
- c) What is Reinforcement learning? Explain types of Reinforcement learning.

<b>Seat No.</b>	
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- 10)** Which of the following are heuristic search algorithms?
- a) Best First Search Algorithm
  - b) A\*Search Algorithm
  - c) Both a) and b)
  - d) None of the above
- 11)** Which of the following is the common language for Artificial Intelligence?
- a) Python
  - b) Java
  - c) Lisp
  - d) PHP
- 12)** Which of the following is a type of artificial intelligence agent?
- a) Learning AI Agent
  - b) Simple Reflex AI Agent
  - c) Goal-Based AI Agent
  - d) All of the above
- 13)** Which of the following are appropriate levels for a knowledge- based AI agent?
- a) Knowledge Level
  - b) Logical Level
  - c) Implementation Level
  - d) All of the above
- 14)** Decisions of Victory/Defeat are made in Game trees using which algorithm?
- a) DFS
  - b) BFS
  - c) Heuristic Search
  - d) Min/Max Algorithm

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR questions. 16**

- a) Explain AO\* Search Algorithm with example.
- b) Define Artificial Intelligence and what are the Applications of AI?
- c) State & explain different types of Agents.
- d) Write short notes.
  - 1) Description logics
  - 2) Situation calculus
- e) Differentiate Informed & Uninformed search.

**Q.3 Solve any TWO questions. 12**

- a) Explain Heuristic Search Algorithm with example.
- b) What is Knowledge based system? Explain First Order Logic in details.
- c) State Different types of uniformed search algorithm. Explain any one in details along with advantages & disadvantages.

**Section – II**

**Q.4 Solve any FOUR questions. 16**

- a) Write a note on Bayesian Network.
- b) Explain in detail about conditional Probability.
- c) What is elementary game theory? Explain with example.
- d) What is Utility Theory? How it will become helpful for talking decision?
- e) Describe the issues in knowledge representation.

**Q.5 Solve any TWO questions. 12**

- a) Explain Decision Tree in details with one example.
- b) Explain Probability and Bayes' theorem along with example.
- c) What is Reinforcement learning? Explain types of Reinforcement learning.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Out of the given options, which of the following algorithms uses the least memory?
  - a) DFS
  - b) BFS
  - c) Both a) and b) are the same
  - d) Cannot be compared
- 2) What is the work of Task Environment and Rational Agents?
  - a) Problem and Solution
  - b) Solution and Problem
  - c) Observation and Problem
  - d) Observation and Solution
- 3) How is a decision reached upon by a decision tree?
  - a) No test
  - b) Single Test
  - c) Double Test
  - d) Multiple sequences of tests
- 4) The different types of machine learning are?
  - a) Supervised
  - b) Unsupervised
  - c) Reinforcement
  - d) All of the above
- 5) If a machine can change its course of action based on the external environment on its own, the machine is called?
  - a) Mobile
  - b) Intelligent
  - c) Both a) and b)
  - d) None of the above
- 6) The "Father of Artificial Intelligence" is \_\_\_\_\_.
  - a) Alan Turing
  - b) Charles Babbage
  - c) John McCarthy
  - d) None of the above
- 7) Which of the following are heuristic search algorithms?
  - a) Best First Search Algorithm
  - b) A\*Search Algorithm
  - c) Both a) and b)
  - d) None of the above
- 8) Which of the following is the common language for Artificial Intelligence?
  - a) Python
  - b) Java
  - c) Lisp
  - d) PHP
- 9) Which of the following is a type of artificial intelligence agent?
  - a) Learning AI Agent
  - b) Simple Reflex AI Agent
  - c) Goal-Based AI Agent
  - d) All of the above

- 10)** Which of the following are appropriate levels for a knowledge- based AI agent?
- a) Knowledge Level
  - b) Logical Level
  - c) Implementation Level
  - d) All of the above
- 11)** Decisions of Victory/Defeat are made in Game trees using which algorithm?
- a) DFS
  - b) BFS
  - c) Heuristic Search
  - d) Min/Max Algorithm
- 12)** What are the different types of Artificial Intelligence approaches?
- a) Strong Approach
  - b) Weak Approach
  - c) Applied Approach
  - d) All of the above
- 13)** How an AI agent does interact with its environment?
- a) Using sensors and perceivers
  - b) Using only sensors
  - c) Using only perceivers
  - d) None of the above
- 14)** The correct ways to solve a problem of state-space search are?
- a) Forward from the initial state
  - b) Backward from the goal
  - c) Both a) and b)
  - d) None of the above

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**Set**

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR questions.** **16**

- a) Explain AO\* Search Algorithm with example.
- b) Define Artificial Intelligence and what are the Applications of AI?
- c) State & explain different types of Agents.
- d) Write short notes.
  - 1) Description logics
  - 2) Situation calculus
- e) Differentiate Informed & Uninformed search.

**Q.3 Solve any TWO questions.** **12**

- a) Explain Heuristic Search Algorithm with example.
- b) What is Knowledge based system? Explain First Order Logic in details.
- c) State Different types of uniformed search algorithm. Explain any one in details along with advantages & disadvantages.

**Section – II**

**Q.4 Solve any FOUR questions.** **16**

- a) Write a note on Bayesian Network.
- b) Explain in detail about conditional Probability.
- c) What is elementary game theory? Explain with example.
- d) What is Utility Theory? How it will become helpful for talking decision?
- e) Describe the issues in knowledge representation.

**Q.5 Solve any TWO questions.** **12**

- a) Explain Decision Tree in details with one example.
- b) Explain Probability and Bayes' theorem along with example.
- c) What is Reinforcement learning? Explain types of Reinforcement learning.



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following are appropriate levels for a knowledge- based AI agent?
 

a) Knowledge Level	b) Logical Level
c) Implementation Level	d) All of the above
- 2) Decisions of Victory/Defeat are made in Game trees using which algorithm?
 

a) DFS	b) BFS
c) Heuristic Search	d) Min/Max Algorithm
- 3) What are the different types of Artificial Intelligence approaches?
 

a) Strong Approach	b) Weak Approach
c) Applied Approach	d) All of the above
- 4) How an AI agent does interact with its environment?
 

a) Using sensors and perceivers	b) Using only sensors
c) Using only perceivers	d) None of the above
- 5) The correct ways to solve a problem of state-space search are?
 

a) Forward from the initial state	b) Backward from the goal
c) Both a) and b)	d) None of the above
- 6) Out of the given options, which of the following algorithms uses the least memory?
 

a) DFS	b) BFS
c) Both a) and b) are the same	d) Cannot be compared
- 7) What is the work of Task Environment and Rational Agents?
 

a) Problem and Solution	b) Solution and Problem
c) Observation and Problem	d) Observation and Solution
- 8) How is a decision reached upon by a decision tree?
 

a) No test	b) Single Test
c) Double Test	d) Multiple sequences of tests



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR questions. 16**

- a) Explain AO\* Search Algorithm with example.
- b) Define Artificial Intelligence and what are the Applications of AI?
- c) State & explain different types of Agents.
- d) Write short notes.
  - 1) Description logics
  - 2) Situation calculus
- e) Differentiate Informed & Uninformed search.

**Q.3 Solve any TWO questions. 12**

- a) Explain Heuristic Search Algorithm with example.
- b) What is Knowledge based system? Explain First Order Logic in details.
- c) State Different types of uniformed search algorithm. Explain any one in details along with advantages & disadvantages.

**Section – II**

**Q.4 Solve any FOUR questions. 16**

- a) Write a note on Bayesian Network.
- b) Explain in detail about conditional Probability.
- c) What is elementary game theory? Explain with example.
- d) What is Utility Theory? How it will become helpful for talking decision?
- e) Describe the issues in knowledge representation.

**Q.5 Solve any TWO questions. 12**

- a) Explain Decision Tree in details with one example.
- b) Explain Probability and Bayes' theorem along with example.
- c) What is Reinforcement learning? Explain types of Reinforcement learning.

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

## 14

- Page 1 of 12

- 9) \_\_\_\_\_ techniques can be used to reduce the number of values for a given continuous attribute, by dividing the range of the attribute into intervals.
- a) Discretization
  - b) Transformation
  - c) Smoothing
  - d) Generalization
- 10) Which of the following method is used for finding optimal of cluster in K-Mean algorithm?
- a) Elbow method
  - b) Manhattan method
  - c) C. Ecludian method
  - d) All of the above
- 11) The Noise and outliers, missing values and duplicate data are problems of \_\_\_\_\_.
- a) Processing data
  - b) Mapping Data
  - c) Evaluating data
  - d) Data quality
- 12) ANN stands for \_\_\_\_\_.
- a) Ariel Neural Network
  - b) Artificial Neural Nucleus
  - c) Artificial Neural Network
  - d) Ariel Neural Nucleus
- 13) Create new attributes that can capture the important information in a data set much more efficiently than the original attributes \_\_\_\_\_.
- a) Feature Creation
  - b) Feature Selection
  - c) PCA
  - d) All of the above
- 14) The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of \_\_\_\_\_.
- a) object detection
  - b) object classification
  - c) object clustering
  - d) All of the above

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full.

**Section – I**

**Q.2 Attempt any FOUR. 16**

- Explain data scale types with suitable example.
- Write short note on “Structured Features”
- Explain kind of features in data science.
- What is meant by Dimensionality Reduction?
- Illustrate singular value decomposition method

**Q.3 Attempt any TWO. 12**

- Explain in detail Principal Component Analysis (PCA).
- Explain how to improve the data quality.
- What do you mean by incomplete features?

**Section – II**

**Q.4 Attempt any FOUR. 16**

- Explain the process of binarization.
- What is the Objective Function of k-Means?
- Explain the image gradients.
- Explain the convolution layer of Neural Network.
- Write variance scaling with examples.

**Q.5 Attempt any TWO. 12**

- Explain in detail k-means clustering.
- Explain the manual feature Extraction HOG.
- Explain the log and power transform and its generalization in brief.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) What is the use of the bin/ binary data structure?
 

a) to have efficient insertion	b) to have efficient region query
c) to have efficient deletion	d) to have efficient traversal
- 2) \_\_\_\_\_ techniques can be used to reduce the number of values for a given continuous attribute, by dividing the range of the attribute into intervals.
 

a) Discretization	b) Transformation
c) Smoothing	d) Generalization
- 3) Which of the following method is used for finding optimal of cluster in K-Mean algorithm?
 

a) Elbow method	b) Manhattan method
c) C. Ecludian method	d) All of the above
- 4) The Noise and outliers, missing values and duplicate data are problems of \_\_\_\_\_.
 

a) Processing data	b) Mapping Data
c) Evaluating data	d) Data quality
- 5) ANN stands for \_\_\_\_\_.
 

a) Ariel Neural Network	b) Artificial Neural Nucleus
c) Artificial Neural Network	d) Ariel Neural Nucleus
- 6) Create new attributes that can capture the important information in a data set much more efficiently than the original attributes \_\_\_\_\_.
 

a) Feature Creation	b) Feature Selection
c) PCA	d) All of the above
- 7) The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of \_\_\_\_\_.
 

a) object detection	b) object classification
c) object clustering	d) All of the above
- 8) Data Analysis is a process of \_\_\_\_\_.
 

a) Inspecting data	b) Cleaning data
c) Transforming data	d) All of the above

- 9) Amongst which of the following step is performed by data scientist after acquiring the data?
- a) Deletion
  - b) Data Replication
  - c) Data Integration
  - d) Data Cleansing
- 10) Amongst which of the following is / are the true about regression analysis?
- a) Describes associations within the data
  - b) Modeling relationships within the data
  - c) Answering yes/no questions about the data
  - d) All of the mentioned above
- 11) By normalizing relations or sets of relations, one minimizes \_\_\_\_\_.
- a) Data
  - b) Fields
  - c) Redundancy
  - d) Database
- 12) A graph that uses vertical bars to represent data is called a \_\_\_\_\_.
- a) Bar graph
  - b) Line graph
  - c) Scatterplot
  - d) All of the mentioned above
- 13) Which of the following techniques would perform better for reducing dimensions of a data set?
- a) Removing columns which have too many missing values
  - b) Removing columns which have high variance in data
  - c) Removing columns with dissimilar data trends
  - d) None of these
- 14) Clustering belongs to \_\_\_\_\_ data analysis.
- a) Supervised
  - b) Unsupervised
  - c) Both a) and b)
  - d) None of the mentioned above



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full.

**Section – I**

**Q.2 Attempt any FOUR. 16**

- a) Explain data scale types with suitable example.
- b) Write short note on “Structured Features”
- c) Explain kind of features in data science.
- d) What is meant by Dimensionality Reduction?
- e) Illustrate singular value decomposition method

**Q.3 Attempt any TWO. 12**

- a) Explain in detail Principal Component Analysis (PCA).
- b) Explain how to improve the data quality.
- c) What do you mean by incomplete features?

**Section – II**

**Q.4 Attempt any FOUR. 16**

- a) Explain the process of binarization.
- b) What is the Objective Function of k-Means?
- c) Explain the image gradients.
- d) Explain the convolution layer of Neural Network.
- e) Write variance scaling with examples.

**Q.5 Attempt any TWO. 12**

- a) Explain in detail k-means clustering.
- b) Explain the manual feature Extraction HOG.
- c) Explain the log and power transform and its generalization in brief.

<b>Seat No.</b>	
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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full.

Marks: 14

## 14

- 1) The Noise and outliers, missing values and duplicate data are problems of \_\_\_\_\_.  
a) Processing data                      b) Mapping Data  
c) Evaluating data                    d) Data quality
- 2) ANN stands for \_\_\_\_\_.  
a) Ariel Neural Network                b) Artificial Neural Nucleus  
c) Artificial Neural Network          d) Ariel Neural Nucleus
- 3) Create new attributes that can capture the important information in a data set much more efficiently than the original attributes \_\_\_\_\_.  
a) Feature Creation                    b) Feature Selection  
c) PCA                                     d) All of the above
- 4) The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of \_\_\_\_\_.  
a) object detection                      b) object classification  
c) object clustering                    d) All of the above
- 5) Data Analysis is a process of \_\_\_\_\_.  
a) Inspecting data                      b) Cleaning data  
c) Transforming data                  d) All of the above
- 6) Amongst which of the following step is performed by data scientist after acquiring the data?  
a) Deletion                                b) Data Replication  
c) Data Integration                    d) Data Cleansing
- 7) Amongst which of the following is / are the true about regression analysis?  
a) Describes associations within the data  
b) Modeling relationships within the data  
c) Answering yes/no questions about the data  
d) All of the mentioned above
- 8) By normalizing relations or sets of relations, one minimizes \_\_\_\_\_.  
a) Data                                      b) Fields  
c) Redundancy                          d) Database



Seat No.	
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Set	R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full.

**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) Explain data scale types with suitable example.
- b) Write short note on “Structured Features”
- c) Explain kind of features in data science.
- d) What is meant by Dimensionality Reduction?
- e) Illustrate singular value decomposition method

**Q.3 Attempt any TWO.** **12**

- a) Explain in detail Principal Component Analysis (PCA).
- b) Explain how to improve the data quality.
- c) What do you mean by incomplete features?

**Section – II**

**Q.4 Attempt any FOUR.** **16**

- a) Explain the process of binarization.
- b) What is the Objective Function of k-Means?
- c) Explain the image gradients.
- d) Explain the convolution layer of Neural Network.
- e) Write variance scaling with examples.

**Q.5 Attempt any TWO.** **12**

- a) Explain in detail k-means clustering.
- b) Explain the manual feature Extraction HOG.
- c) Explain the log and power transform and its generalization in brief.

Seat No.	
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Set **S**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following techniques would perform better for reducing dimensions of a data set?
  - a) Removing columns which have too many missing values
  - b) Removing columns which have high variance in data
  - c) Removing columns with dissimilar data trends
  - d) None of these
- 2) Clustering belongs to \_\_\_\_\_ data analysis.
  - a) Supervised
  - b) Unsupervised
  - c) Both a) and b)
  - d) None of the mentioned above
- 3) What is the use of the bin/ binary data structure?
  - a) to have efficient insertion
  - b) to have efficient region query
  - c) to have efficient deletion
  - d) to have efficient traversal
- 4) \_\_\_\_\_ techniques can be used to reduce the number of values for a given continuous attribute, by dividing the range of the attribute into intervals.
  - a) Discretization
  - b) Transformation
  - c) Smoothing
  - d) Generalization
- 5) Which of the following method is used for finding optimal of cluster in K-Mean algorithm?
  - a) Elbow method
  - b) Manhattan method
  - c) C. Ecludian method
  - d) All of the above
- 6) The Noise and outliers, missing values and duplicate data are problems of \_\_\_\_\_.
  - a) Processing data
  - b) Mapping Data
  - c) Evaluating data
  - d) Data quality
- 7) ANN stands for \_\_\_\_\_.
  - a) Ariel Neural Network
  - b) Artificial Neural Nucleus
  - c) Artificial Neural Network
  - d) Ariel Neural Nucleus
- 8) Create new attributes that can capture the important information in a data set much more efficiently than the original attributes \_\_\_\_\_.
  - a) Feature Creation
  - b) Feature Selection
  - c) PCA
  - d) All of the above

- 9) The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of \_\_\_\_\_.  
a) object detection                      b) object classification  
c) object clustering                      d) All of the above
- 10) Data Analysis is a process of \_\_\_\_\_.  
a) Inspecting data                      b) Cleaning data  
c) Transforming data                      d) All of the above
- 11) Amongst which of the following step is performed by data scientist after acquiring the data?  
a) Deletion                      b) Data Replication  
c) Data Integration                      d) Data Cleansing
- 12) Amongst which of the following is / are the true about regression analysis?  
a) Describes associations within the data  
b) Modeling relationships within the data  
c) Answering yes/no questions about the data  
d) All of the mentioned above
- 13) By normalizing relations or sets of relations, one minimizes \_\_\_\_\_.  
a) Data                      b) Fields  
c) Redundancy                      d) Database
- 14) A graph that uses vertical bars to represent data is called a \_\_\_\_\_.  
a) Bar graph                      b) Line graph  
c) Scatterplot                      d) All of the mentioned above

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov– 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Processing & Feature Engineering**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full.

**Section – I**

**Q.2 Attempt any FOUR. 16**

- a) Explain data scale types with suitable example.
- b) Write short note on “Structured Features”
- c) Explain kind of features in data science.
- d) What is meant by Dimensionality Reduction?
- e) Illustrate singular value decomposition method

**Q.3 Attempt any TWO. 12**

- a) Explain in detail Principal Component Analysis (PCA).
- b) Explain how to improve the data quality.
- c) What do you mean by incomplete features?

**Section – II**

**Q.4 Attempt any FOUR. 16**

- a) Explain the process of binarization.
- b) What is the Objective Function of k-Means?
- c) Explain the image gradients.
- d) Explain the convolution layer of Neural Network.
- e) Write variance scaling with examples.

**Q.5 Attempt any TWO. 12**

- a) Explain in detail k-means clustering.
- b) Explain the manual feature Extraction HOG.
- c) Explain the log and power transform and its generalization in brief.

Seat No.	
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Set P
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Each question carries one mark  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which of the following managed components is responsible for relaying messages between communications channels such as MQTT, IPC, and the cloud?
  - a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these
- 2) Managing streams for real-time processing applies to the \_\_\_\_\_.
  - a) edge and the cloud
  - b) edge only
  - c) cloud only
  - d) None of these
- 3) Which of the following managed components is responsible for synchronizing the state between the edge and the cloud?
  - a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these
- 4) All of the logic of the component could be contained in the recipe life cycle scripts and does not require an \_\_\_\_\_.
  - a) artifact
  - b) config file
  - c) program
  - d) certificate
- 5) Bounded context and ubiquitous language are distinct concepts within \_\_\_\_\_.
  - a) data-driven design
  - b) domain-driven design
  - c) architecture-driven design
  - d) None of these
- 6) \_\_\_\_\_ can be deployed to IoT Greengrass devices either locally or remotely.
  - a) Group Version
  - b) Definition version
  - c) Components
  - d) Function Definition
- 7) The {"temperature": 70} message is an example of \_\_\_\_\_ data and is serializable.
  - a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 8) \_\_\_\_\_ is not the most optimized data format for big data processing.
  - a) Apache ORC
  - b) Parquet
  - c) AVRO
  - d) JSON



- 9) Image data from a camera and transmitted as binary data is an example of \_\_\_\_\_ data.
- a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 10) Who is the primary persona at the heart of any industrial solution?
- a) industrialists
  - b) operators and maintainers
  - c) programmers
  - d) data injectors
- 11) A single component can both reset configuration and \_\_\_\_\_ in a new configuration.
- a) restart
  - b) replace
  - c) merge
  - d) None of above
- 12) IoT Greengrass operates at the \_\_\_\_\_ layer of the OSI model.
- a) Physical
  - b) Network
  - c) Application
  - d) None of above
- 13) Edge devices can belong to multiple \_\_\_\_\_ and each thing group can define one active deployment.
- a) thing groups
  - b) thing artifacts
  - c) IAM roles
  - d) policies
- 14) Which of the following managed components is responsible for deploying a local MQTT broker and connecting leaf devices?
- a) Bridge
  - b) Moquette
  - c) Device shadows
  - d) None of these

<b>Seat No.</b>	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What are the three primary types of tools needed to deliver intelligence workloads at the edge?
- b) Describe one use case for the smart home vertical that ties in with one more of the key benefits for ML-powered edge solutions?
- c) What is the benefit of isolating your code and dependencies from other services?
- d) What is the benefit of using a publish/subscribe model to exchange messages?

**Q.3 Attempt any TWO.** **16**

- a) What is the benefit of decoupling services in your edge architecture?
- b) What do you think is the worst-case scenario if your home network router was compromised by an attacker but was still processing traffic as normal?
- c) What are the common components of an edge solution?

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Can you modify an artifact stored in the cloud after it has been included in a registered custom component?
- b) What is the benefit of performing a data modeling exercise?
- c) Discuss at least one benefit of using a serverless function for processing IoT data?
- d) What business intelligence (BI) services can you use for data exposition to end consumers?

**Q.5 Attempt any TWO.** **16**

- a) What are some examples that differentiate static and dynamic resources of an edge component?
- b) Is there any relevance of ETL architectures for edge computing?  
(Hint: Think lambda.)
- c) What do you think is necessary to have an operational data store or a data lake/data warehouse?

Seat No.	
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Set **Q**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Each question carries one mark  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ is not the most optimized data format for big data processing.
  - a) Apache ORC
  - b) Parquet
  - c) AVRO
  - d) JSON
- 2) Image data from a camera and transmitted as binary data is an example of \_\_\_\_\_ data.
  - a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 3) Who is the primary persona at the heart of any industrial solution?
  - a) industrialists
  - b) operators and maintainers
  - c) programmers
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  - a) restart
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  - c) merge
  - d) None of above
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  - a) Physical
  - b) Network
  - c) Application
  - d) None of above
- 6) Edge devices can belong to multiple \_\_\_\_\_ and each thing group can define one active deployment.
  - a) thing groups
  - b) thing artifacts
  - c) IAM roles
  - d) policies
- 7) Which of the following managed components is responsible for deploying a local MQTT broker and connecting leaf devices?
  - a) Bridge
  - b) Moquette
  - c) Device shadows
  - d) None of these
- 8) Which of the following managed components is responsible for relaying messages between communications channels such as MQTT, IPC, and the cloud?
  - a) MQTT bridge
  - b) Moquette
  - c) device shadows
  - d) None of these

- 9) Managing streams for real-time processing applies to the \_\_\_\_\_.  
a) edge and the cloud                      b) edge only  
c) cloud only                                  d) None of these
- 10) Which of the following managed components is responsible for synchronizing the state between the edge and the cloud?  
a) MQTT bridge                              b) Moquette  
c) device shadows                          d) None of these
- 11) All of the logic of the component could be contained in the recipe life cycle scripts and does not require an \_\_\_\_\_.  
a) artifact                                      b) config file  
c) program                                      d) certificate
- 12) Bounded context and ubiquitous language are distinct concepts within \_\_\_\_\_.  
a) data-driven design                      b) domain-driven design  
c) architecture-driven design              d) None of these
- 13) \_\_\_\_\_ can be deployed to IoT Greengrass devices either locally or remotely.  
a) Group Version                              b) Definition version  
c) Components                                d) Function Definition
- 14) The {"temperature": 70} message is an example of \_\_\_\_\_ data and is serializable.  
a) Structured                                  b) Unstructured  
c) Semi structured                          d) None of above

<b>Seat No.</b>	
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**Set Q**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What are the three primary types of tools needed to deliver intelligence workloads at the edge?
- b) Describe one use case for the smart home vertical that ties in with one more of the key benefits for ML-powered edge solutions?
- c) What is the benefit of isolating your code and dependencies from other services?
- d) What is the benefit of using a publish/subscribe model to exchange messages?

**Q.3 Attempt any TWO.** **16**

- a) What is the benefit of decoupling services in your edge architecture?
- b) What do you think is the worst-case scenario if your home network router was compromised by an attacker but was still processing traffic as normal?
- c) What are the common components of an edge solution?

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Can you modify an artifact stored in the cloud after it has been included in a registered custom component?
- b) What is the benefit of performing a data modeling exercise?
- c) Discuss at least one benefit of using a serverless function for processing IoT data?
- d) What business intelligence (BI) services can you use for data exposition to end consumers?

**Q.5 Attempt any TWO.** **16**

- a) What are some examples that differentiate static and dynamic resources of an edge component?
- b) Is there any relevance of ETL architectures for edge computing?  
(Hint: Think lambda.)
- c) What do you think is necessary to have an operational data store or a data lake/data warehouse?

Seat No.	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Each question carries one mark  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A single component can both reset configuration and \_\_\_\_\_ in a new configuration.
 

a) restart	b) replace
c) merge	d) None of above
- 2) IoT Greengrass operates at the \_\_\_\_\_ layer of the OSI model.
 

a) Physical	b) Network
c) Application	d) None of above
- 3) Edge devices can belong to multiple \_\_\_\_\_ and each thing group can define one active deployment.
 

a) thing groups	b) thing artifacts
c) IAM roles	d) policies
- 4) Which of the following managed components is responsible for deploying a local MQTT broker and connecting leaf devices?
 

a) Bridge	b) Moquette
c) Device shadows	d) None of these
- 5) Which of the following managed components is responsible for relaying messages between communications channels such as MQTT, IPC, and the cloud?
 

a) MQTT bridge	b) Moquette
c) device shadows	d) None of these
- 6) Managing streams for real-time processing applies to the \_\_\_\_\_.
 

a) edge and the cloud	b) edge only
c) cloud only	d) None of these
- 7) Which of the following managed components is responsible for synchronizing the state between the edge and the cloud?
 

a) MQTT bridge	b) Moquette
c) device shadows	d) None of these
- 8) All of the logic of the component could be contained in the recipe life cycle scripts and does not require an \_\_\_\_\_.
 

a) artifact	b) config file
c) program	d) certificate

- 9) Bounded context and ubiquitous language are distinct concepts within \_\_\_\_.
- a) data-driven design
  - b) domain-driven design
  - c) architecture-driven design
  - d) None of these
- 10) \_\_\_\_\_ can be deployed to IoT Greengrass devices either locally or remotely.
- a) Group Version
  - b) Definition version
  - c) Components
  - d) Function Definition
- 11) The {"temperature": 70} message is an example of \_\_\_\_\_ data and is serializable.
- a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 12) \_\_\_\_\_ is not the most optimized data format for big data processing.
- a) Apache ORC
  - b) Parquet
  - c) AVRO
  - d) JSON
- 13) Image data from a camera and transmitted as binary data is an example of \_\_\_\_\_ data.
- a) Structured
  - b) Unstructured
  - c) Semi structured
  - d) None of above
- 14) Who is the primary persona at the heart of any industrial solution?
- a) industrialists
  - b) operators and maintainers
  - c) programmers
  - d) data injectors

<b>Seat No.</b>	
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**Set R**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What are the three primary types of tools needed to deliver intelligence workloads at the edge?
- b) Describe one use case for the smart home vertical that ties in with one more of the key benefits for ML-powered edge solutions?
- c) What is the benefit of isolating your code and dependencies from other services?
- d) What is the benefit of using a publish/subscribe model to exchange messages?

**Q.3 Attempt any TWO.** **16**

- a) What is the benefit of decoupling services in your edge architecture?
- b) What do you think is the worst-case scenario if your home network router was compromised by an attacker but was still processing traffic as normal?
- c) What are the common components of an edge solution?

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Can you modify an artifact stored in the cloud after it has been included in a registered custom component?
- b) What is the benefit of performing a data modeling exercise?
- c) Discuss at least one benefit of using a serverless function for processing IoT data?
- d) What business intelligence (BI) services can you use for data exposition to end consumers?

**Q.5 Attempt any TWO.** **16**

- a) What are some examples that differentiate static and dynamic resources of an edge component?
- b) Is there any relevance of ETL architectures for edge computing?  
(Hint: Think lambda.)
- c) What do you think is necessary to have an operational data store or a data lake/data warehouse?



Seat No.	
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**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Each question carries one mark  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ can be deployed to IoT Greengrass devices either locally or remotely.
 

a) Group Version	b) Definition version
c) Components	d) Function Definition
- 2) The {"temperature": 70} message is an example of \_\_\_\_\_ data and is serializable.
 

a) Structured	b) Unstructured
c) Semi structured	d) None of above
- 3) \_\_\_\_\_ is not the most optimized data format for big data processing.
 

a) Apache ORC	b) Parquet
c) AVRO	d) JSON
- 4) Image data from a camera and transmitted as binary data is an example of \_\_\_\_\_ data.
 

a) Structured	b) Unstructured
c) Semi structured	d) None of above
- 5) Who is the primary persona at the heart of any industrial solution?
 

a) industrialists	b) operators and maintainers
c) programmers	d) data injectors
- 6) A single component can both reset configuration and \_\_\_\_\_ in a new configuration.
 

a) restart	b) replace
c) merge	d) None of above
- 7) IoT Greengrass operates at the \_\_\_\_\_ layer of the OSI model.
 

a) Physical	b) Network
c) Application	d) None of above
- 8) Edge devices can belong to multiple \_\_\_\_\_ and each thing group can define one active deployment.
 

a) thing groups	b) thing artifacts
c) IAM roles	d) policies

- 9) Which of the following managed components is responsible for deploying a local MQTT broker and connecting leaf devices?
- a) Bridge
  - b) Moquette
  - c) Device shadows
  - d) None of these
- 10) Which of the following managed components is responsible for relaying messages between communications channels such as MQTT, IPC, and the cloud?
- a) MQTT bridge
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- 11) Managing streams for real-time processing applies to the \_\_\_\_.
- a) edge and the cloud
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  - c) cloud only
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- 12) Which of the following managed components is responsible for synchronizing the state between the edge and the cloud?
- a) MQTT bridge
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- 14) Bounded context and ubiquitous language are distinct concepts within \_\_\_\_.
- a) data-driven design
  - b) domain-driven design
  - c) architecture-driven design
  - d) None of these

<b>Seat No.</b>	
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**Set S**

**T.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Industrial IoT**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What are the three primary types of tools needed to deliver intelligence workloads at the edge?
- b) Describe one use case for the smart home vertical that ties in with one more of the key benefits for ML-powered edge solutions?
- c) What is the benefit of isolating your code and dependencies from other services?
- d) What is the benefit of using a publish/subscribe model to exchange messages?

**Q.3 Attempt any TWO.** **16**

- a) What is the benefit of decoupling services in your edge architecture?
- b) What do you think is the worst-case scenario if your home network router was compromised by an attacker but was still processing traffic as normal?
- c) What are the common components of an edge solution?

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Can you modify an artifact stored in the cloud after it has been included in a registered custom component?
- b) What is the benefit of performing a data modeling exercise?
- c) Discuss at least one benefit of using a serverless function for processing IoT data?
- d) What business intelligence (BI) services can you use for data exposition to end consumers?

**Q.5 Attempt any TWO.** **16**

- a) What are some examples that differentiate static and dynamic resources of an edge component?
- b) Is there any relevance of ETL architectures for edge computing?  
(Hint: Think lambda.)
- c) What do you think is necessary to have an operational data store or a data lake/data warehouse?

Seat No.	
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Set	P
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication and Signaling in Railway**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) When semaphore and Warner signals are installed on the same post, then the stop indication is given when \_\_\_\_\_.  
 a) Semaphore arm is lowered but Warner arm is horizontal  
 b) Both semaphore and Warner arms are lowered  
 c) Both the arms are horizontal  
 d) None of the above
- 2) In railways, the disc signals are provided for the purpose of \_\_\_\_\_.  
 a) dead slow movement                      b) indicating busy platform  
 c) possible danger ahead                      d) shunting
- 3) Semaphore-type signals are used when the maintenance or repair work is more than \_\_\_\_\_.  
 a) 1 – week    b) 4 days  
 c) 3 days    d) 2 days
- 4) Shunting signals are known as \_\_\_\_\_.  
 a) Routing signals                                      b) Starter signals  
 c) Ground signals                                      d) Warner signals
- 5) In railways the signal that also acts as a routing signal is \_\_\_\_\_.  
 a) Home signal    b) Advance starter signal  
 c) Outer signal    d) Starter signal
- 6) What is internet?  
 a) Programming language  
 b) Network connecting computers all over the world  
 c) Computer program to transfer data  
 d) All of these
- 7) Which of these is a non-profit domain?  
 a) .com    b) .in  
 c) .org    d) All of these
- 8) Which of these are web browsers?  
 a) Google Chrome    b) Internet Explorer  
 c) Brave    d) All of these

- 9) The purpose of using flux in soldering is to \_\_\_\_\_.  
a) Increase fluidity of solder metal  
b) Fill up gaps left in a bad joint  
c) Carbon steel  
d) Prevent oxides forming
- 10) State the reason for the thermal shutdown of IC regulator.  
a) Spikes in temperature                      b) Decrease in temperature  
c) Fluctuation in temperature              d) Increase in temperature
- 11) On which of the following effects of electric current a fuse operates?  
a) Photoelectric effect                      b) Electrostatic effect  
c) Heating effect                              d) Magnetic effect
- 12) A soldering iron 'bit' is made of \_\_\_\_\_.  
a) Brass    b) Tin  
c) Steel    d) Copper
- 13) What is the max data transfer rate for optical fiber cable?  
a) 10 Mbps                                      b) 100 Mbps  
c) 1000 Mbps                                  d) 10000 Mbps
- 14) Fiber optics possess the following properties \_\_\_\_\_.  
a) Immune electromagnetic interference  
b) Very less signal attenuation  
c) Very hard to tap  
d) All of these

Seat No.	
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Set

P

**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication and Signaling in Railway**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) What are the types of networking cables? Explain
- b) What do you mean by email? Give examples of email attacks.
- c) Give uses & advantages of email.
- d) What do you mean by Rectifiers? Give classification.
- e) Write a short note on IC Regulators.

**Q.3 Attempt any TWO.** **12**

- a) Explain & compare the Internet & Intranet.
- b) Write a note on WWW (World Wide Web).
- c) Write note on different batteries.

**Section – II**

**Q.4 Attempt any FOUR.** **16**

- a) Give & explain the classification of Railway signals according to functions.
- b) Explain the Client-Server communication model.
- c) Explain DHCP (Dynamic Host Configuration Protocol)
- d) Explain the classification of signaling relays.
- e) Write a short note on Railnet.

**Q.5 Attempt any TWO.** **12**

- a) What are the special signals used in Railway signaling?
- b) Write a notes on FTP (File Transfer Protocol)
- c) Explain Network security in Computer Network.

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication and Signaling in Railway**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of these are web browsers?
 

a) Google Chrome	b) Internet Explorer
c) Brave	d) All of these
- 2) The purpose of using flux in soldering is to \_\_\_\_\_.
 

a) Increase fluidity of solder metal
b) Fill up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming
- 3) State the reason for the thermal shutdown of IC regulator.
 

a) Spikes in temperature	b) Decrease in temperature
c) Fluctuation in temperature	d) Increase in temperature
- 4) On which of the following effects of electric current a fuse operates?
 

a) Photoelectric effect	b) Electrostatic effect
c) Heating effect	d) Magnetic effect
- 5) A soldering iron 'bit' is made of \_\_\_\_\_.
 

a) Brass	b) Tin
c) Steel	d) Copper
- 6) What is the max data transfer rate for optical fiber cable?
 

a) 10 Mbps	b) 100 Mbps
c) 1000 Mbps	d) 10000 Mbps
- 7) Fiber optics possess the following properties \_\_\_\_\_.
 

a) Immune electromagnetic interference
b) Very less signal attenuation
c) Very hard to tap
d) All of these

- 8) When semaphore and Warner signals are installed on the same post, then the stop indication is given when \_\_\_\_\_.  
a) Semaphore arm is lowered but Warner arm is horizontal  
b) Both semaphore and Warner arms are lowered  
c) Both the arms are horizontal  
d) None of the above
- 9) In railways, the disc signals are provided for the purpose of \_\_\_\_\_.  
a) dead slow movement                      b) indicating busy platform  
c) possible danger ahead                      d) shunting
- 10) Semaphore-type signals are used when the maintenance or repair work is more than \_\_\_\_\_.  
a) 1 – week                                      b) 4 days  
c) 3 days    d) 2 days
- 11) Shunting signals are known as \_\_\_\_\_.  
a) Routing signals                              b) Starter signals  
c) Ground signals                              d) Warner signals
- 12) In railways the signal that also acts as a routing signal is \_\_\_\_\_.  
a) Home signal                                  b) Advance starter signal  
c) Outer signal                                  d) Starter signal
- 13) What is internet?  
a) Programming language  
b) Network connecting computers all over the world  
c) Computer program to transfer data  
d) All of these
- 14) Which of these is a non-profit domain?  
a) .com    b) .in  
c) .org    d) All of these



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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication and Signaling in Railway**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) What are the types of networking cables? Explain
- b) What do you mean by email? Give examples of email attacks.
- c) Give uses & advantages of email.
- d) What do you mean by Rectifiers? Give classification.
- e) Write a short note on IC Regulators.

**Q.3 Attempt any TWO.** **12**

- a) Explain & compare the Internet & Intranet.
- b) Write a note on WWW (World Wide Web).
- c) Write note on different batteries.

**Section – II**

**Q.4 Attempt any FOUR.** **16**

- a) Give & explain the classification of Railway signals according to functions.
- b) Explain the Client-Server communication model.
- c) Explain DHCP (Dynamic Host Configuration Protocol)
- d) Explain the classification of signaling relays.
- e) Write a short note on Railnet.

**Q.5 Attempt any TWO.** **12**

- a) What are the special signals used in Railway signaling?
- b) Write a notes on FTP (File Transfer Protocol)
- c) Explain Network security in Computer Network.

Seat No.	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication and Signaling in Railway**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) On which of the following effects of electric current a fuse operates?
  - a) Photoelectric effect
  - b) Electrostatic effect
  - c) Heating effect
  - d) Magnetic effect
- 2) A soldering iron 'bit' is made of \_\_\_\_\_.
  - a) Brass
  - b) Tin
  - c) Steel
  - d) Copper
- 3) What is the max data transfer rate for optical fiber cable?
  - a) 10 Mbps
  - b) 100 Mbps
  - c) 1000 Mbps
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  - a) Immune electromagnetic interference
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  - c) Very hard to tap
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- 6) In railways, the disc signals are provided for the purpose of \_\_\_\_\_.
  - a) dead slow movement
  - b) indicating busy platform
  - c) possible danger ahead
  - d) shunting
- 7) Semaphore-type signals are used when the maintenance or repair work is more than \_\_\_\_\_.
  - a) 1 – week
  - b) 4 days
  - c) 3 days
  - d) 2 days
- 8) Shunting signals are known as \_\_\_\_\_.
  - a) Routing signals
  - b) Starter signals
  - c) Ground signals
  - d) Warner signals

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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication and Signaling in Railway**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) What are the types of networking cables? Explain
- b) What do you mean by email? Give examples of email attacks.
- c) Give uses & advantages of email.
- d) What do you mean by Rectifiers? Give classification.
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**Q.3 Attempt any TWO.** **12**

- a) Explain & compare the Internet & Intranet.
- b) Write a note on WWW (World Wide Web).
- c) Write note on different batteries.

**Section – II**

**Q.4 Attempt any FOUR.** **16**

- a) Give & explain the classification of Railway signals according to functions.
- b) Explain the Client-Server communication model.
- c) Explain DHCP (Dynamic Host Configuration Protocol)
- d) Explain the classification of signaling relays.
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- a) What are the special signals used in Railway signaling?
- b) Write a notes on FTP (File Transfer Protocol)
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Seat No.	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication and Signaling in Railway**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is internet?
  - a) Programming language
  - b) Network connecting computers all over the world
  - c) Computer program to transfer data
  - d) All of these
- 2) Which of these is a non-profit domain?
  - a) .com
  - b) .in
  - c) .org
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  - d) Prevent oxides forming
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  - a) Spikes in temperature
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  - c) Fluctuation in temperature
  - d) Increase in temperature
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  - c) Steel
  - d) Copper
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  - c) 1000 Mbps
  - d) 10000 Mbps

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b) Both semaphore and Warner arms are lowered  
c) Both the arms are horizontal  
d) None of the above
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a) dead slow movement                      b) indicating busy platform  
c) possible danger ahead                      d) shunting
- 12) Semaphore-type signals are used when the maintenance or repair work is more than \_\_\_\_\_.  
a) 1 – week                                      b) 4 days  
c) 3 days    d) 2 days
- 13) Shunting signals are known as \_\_\_\_\_.  
a) Routing signals                              b) Starter signals  
c) Ground signals                              d) Warner signals
- 14) In railways the signal that also acts as a routing signal is \_\_\_\_\_.  
a) Home signal                                  b) Advance starter signal  
c) Outer signal                                  d) Starter signal

Seat No.	
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**T.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication and Signaling in Railway**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) What are the types of networking cables? Explain
- b) What do you mean by email? Give examples of email attacks.
- c) Give uses & advantages of email.
- d) What do you mean by Rectifiers? Give classification.
- e) Write a short note on IC Regulators.

**Q.3 Attempt any TWO.** **12**

- a) Explain & compare the Internet & Intranet.
- b) Write a note on WWW (World Wide Web).
- c) Write note on different batteries.

**Section – II**

**Q.4 Attempt any FOUR.** **16**

- a) Give & explain the classification of Railway signals according to functions.
- b) Explain the Client-Server communication model.
- c) Explain DHCP (Dynamic Host Configuration Protocol)
- d) Explain the classification of signaling relays.
- e) Write a short note on Railnet.

**Q.5 Attempt any TWO.** **12**

- a) What are the special signals used in Railway signaling?
- b) Write a notes on FTP (File Transfer Protocol)
- c) Explain Network security in Computer Network.

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above



- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
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- 3) Which one of the following is not the function of money?
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  - a) Average cost
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  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
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  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

<b>Seat No.</b>	
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**Set Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_.
- a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 10) Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |



Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

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<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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Set	P
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850

- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

<b>Seat No.</b>	
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- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
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  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
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- 5) Which of the following is the reformist movement?
  - a) Chipko movement
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  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set 

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 2) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 3) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 4) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 5) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 6) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 7) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 2) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 3) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
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- 4) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
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a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 6) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 8) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 9) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 10) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

## 10

- 1) Anxiety can cause the following moods \_\_\_\_\_.  
a) Irritable                                      b) Nervous  
c) Anxious                                        d) All of the above
- 2) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
a) Role stagnation                                b) Role Isolation  
c) Role erosion                                    d) Role ambiguity
- 3) Stress is \_\_\_\_\_ related to performance.  
a) Positively                                      b) Negatively  
c) Proportionately                                d) None of these
- 4) Which one is not considered as Environmental stressors?  
a) Weather                                         b) Traffic  
c) Financial problems                             d) Substandard housing
- 5) The following are the characteristics of Positive Stress.  
a) It improves performance                    b) It feels exciting  
c) It motivates                                    d) All of the above
- 6) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
a) Draw tight                                      b) Stimulus  
c) Force     d) Attitude
- 7) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
a) Medical                                         b) Psychological  
c) Behavioral                                       d) None of these
- 8) When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later                          b) Drink alcohol to relax  
c) Break it down into smaller task          d) Avoid the task
- 9) A good way to prevent stress is \_\_\_\_\_.  
a) Drinking beverages high in caffeine  
b) Sitting ideal doing nothing  
c) Overeating  
d) Taking time out for relaxation



- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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**Set****P**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

- 1) The word Stress is derived from Latin word ‘Stringere’ which means \_\_\_\_\_.  
a) Draw tight                                      b) Stimulus  
c) Force    d) Attitude
- 2) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
a) Medical    b) Psychological  
c) Behavioral                                         d) None of these
- 3) When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later                          b) Drink alcohol to relax  
c) Break it down into smaller task          d) Avoid the task
- 4) A good way to prevent stress is \_\_\_\_\_.  
a) Drinking beverages high in caffeine  
b) Sitting ideal doing nothing  
c) Overeating  
d) Taking time out for relaxation
- 5) \_\_\_\_\_ is referred as a stressful event.  
a) Birthday    b) Studying  
c) Spouse death                                     d) Vacation
- 6) Anxiety can cause the following moods \_\_\_\_\_.  
a) Irritable    b) Nervous  
c) Anxious    d) All of the above
- 7) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
a) Role stagnation                                 b) Role Isolation  
c) Role erosion                                       d) Role ambiguity
- 8) Stress is \_\_\_\_\_ related to performance.  
a) Positively     b) Negatively  
c) Proportionately                                 d) None of these
- 9) Which one is not considered as Environmental stressors?  
a) Weather    b) Traffic  
c) Financial problems                             d) Substandard housing

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later      b) Drink alcohol to relax  
c) Break it down into smaller task      d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |



Seat No.	
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Set	S
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

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<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4 Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4 Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks:10

## 10

- 1) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 2) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 4) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 5) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above
- 6) The objectives of professional ethics in engineering are
  - a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

- a) Culture
- c) Society

- b) Value  
d) Moral

- a) Moral  
c) Values

- b) Ethics
- d) Positive and preferred values

<b>Seat No.</b>	
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**Set**

<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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Set

P

**T.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Total flux passing through a closed surface held in a magnetic field is
  - a) Infinity
  - b) Zero
  - c) Unity
  - d) None of these
- 2) Energy density is given as \_\_\_\_\_.
  - a) Energy per unit volume
  - b) Energy per unit area
  - c) Linear energy
  - d) All of these
- 3) Surface integral with volume integral relation is given by
  - a) Divergence theorem
  - b) Ampere's law
  - c) Poynting Theorem
  - d) Coulomb's law
- 4) According to Maxwell's first equation in differential form gives
  - a)  $\nabla \cdot D = \rho_v$
  - b)  $\int D ds = \int (\nabla \cdot D) dv$
  - c)  $\int H dl = \int (\nabla \times H) ds$
  - d)  $\nabla \times H = J_c + J_d$
- 5) In good conductors, rate of attenuation is
  - a) Small
  - b) Large
  - c) Infinity
  - d) Zero
- 6) The normal components of D are \_\_\_\_\_ across a dielectric boundary
  - a) discontinuous
  - b) continuous
  - c) zero
  - d)  $\infty$
- 7) "The total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed". This statement is associated with
  - a) Coulomb's square law
  - b) Gauss's law
  - c) Maxwell's first law
  - d) Maxwell's second law
- 8) The lines having R, L, C distributed along the circuit are called
  - a) Lumped
  - b) Distributed
  - c) Parallel
  - d) Paired



- 9) The characteristic impedance of a transmission line with impedance and admittance of 16 and 9 respectively is
- a) 25
  - b) 7
  - c) 1.33
  - d) 0.75
- 10) If potential of 1V is applied across a capacitor of 10pF, the energy stored is
- a) zero
  - b) 2.5 pJ
  - c) 10 pJ
  - d) 5 pJ
- 11) The propagation of the electromagnetic waves can be illustrated by
- a) Faraday law
  - b) Ampere law
  - c) Fleming rule
  - d) Coulomb law
- 12) The Stoke's theorem uses which of the following operation?
- a) Divergence
  - b) Gradient
  - c) Curl
  - d) Laplacian
- 13) The Poynting vector is the power component that is calculated by the
- a) Product of E and H
  - b) Ratio of E and H
  - c) Dot product of E and H
  - d) Cross product of E and H
- 14) The potential due to a dipole at a point P from it is the
- a) Sum of potentials at the charges
  - b) Difference of potentials at the charges
  - c) Multiplication of potentials at the charges
  - d) Ratio of potentials at the charges

Seat No.	
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Set

P

**T.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Three.** **12**

- State and explain Coulomb's law.
- Two charges  $Q_1 = 300\mu\text{C}$  &  $Q_2 = -40\mu\text{C}$  are placed at (1, -1, -3) m and at (3, -3, -2) m. Find the force acting on charge  $Q_1$  due to charge  $Q_2$ .
- State and verify Ampere's Circuital Law.
- If  $\vec{D} = 2xy\vec{a}_x + x^2y\vec{a}_y$  (C/m<sup>2</sup>) and the rectangular parallelepiped formed by the planes  $x = 0$  &  $x = 1$ ,  $y = 0$  &  $y = 2$  and  $z = 0$  &  $z = 3$ . Apply divergence theorem to find out the charge.

**Q.3 Attempt any two.** **16**

- Given a dipole at origin in free space has a moment of  $400\pi \epsilon_0 (0.6\vec{a}_x - 0.75\vec{a}_y + 0.8\vec{a}_z)$  C.m. Find the potential at i) (0,5,0) ii) (2,3,4).
- Derive the boundary conditions of electrostatic fields for conductor-free space medium.
- State and prove point form of Gauss' Law.

**Section – II**

**Q.4 Attempt any Three.** **12**

- State and derive the Maxwell's equations of Faraday's law and Ampere's law for static fields.
- Define following parameters of transmission line
  - Characteristic Impedance
  - Propagation constant
  - Reflection coefficient
  - Transmission coefficient
- Derive the wave equation for electric field for lossless media by using Maxwell's equation  $\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$ .
- Derive the transmission line equation in terms of voltage.

**Q.5 Attempt any two.** **16**

- State and derive Poynting theorem.
- If the field quantities  $\vec{E} = 2 \sin x \cdot \sin t \vec{a}_y$  and  $\vec{H} = \frac{2}{\mu_0} \cos x \cdot \cos t \vec{a}_z$  are given. Verify whether the given pairs of fields satisfy Maxwell's equations or not.
- What is Smith chart & how it is constructed? Write the applications of Smith chart.

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The lines having R, L, C distributed along the circuit are called
  - a) Lumped
  - b) Distributed
  - c) Parallel
  - d) Paired
- 2) The characteristic impedance of a transmission line with impedance and admittance of 16 and 9 respectively is
  - a) 25
  - b) 7
  - c) 1.33
  - d) 0.75
- 3) If potential of 1V is applied across a capacitor of 10pF, the energy stored is
  - a) zero
  - b) 2.5 pJ
  - c) 10 pJ
  - d) 5 pJ
- 4) The propagation of the electromagnetic waves can be illustrated by
  - a) Faraday law
  - b) Ampere law
  - c) Fleming rule
  - d) Coulomb law
- 5) The Stoke's theorem uses which of the following operation?
  - a) Divergence
  - b) Gradient
  - c) Curl
  - d) Laplacian
- 6) The Poynting vector is the power component that is calculated by the
  - a) Product of E and H
  - b) Ratio of E and H
  - c) Dot product of E and H
  - d) Cross product of E and H
- 7) The potential due to a dipole at a point P from it is the
  - a) Sum of potentials at the charges
  - b) Difference of potentials at the charges
  - c) Multiplication of potentials at the charges
  - d) Ratio of potentials at the charges
- 8) Total flux passing through a closed surface held in a magnetic field is
  - a) Infinity
  - b) Zero
  - c) Unity
  - d) None of these
- 9) Energy density is given as \_\_\_\_\_.
  - a) Energy per unit volume
  - b) Energy per unit area
  - c) Linear energy
  - d) All of these

- 10) Surface integral with volume integral relation is given by  
a) Divergence theorem                      b) Ampere's law  
c) Poynting Theorem                      d) Coulomb's law
- 11) According to Maxwell's first equation in differential form gives  
a)  $\nabla \cdot D = \rho_v$                       b)  $\int D ds = \int (\nabla \cdot D) dv$   
c)  $\int H dl = \int (\nabla \times H) ds$                       d)  $\nabla \times H = J_c + J_d$
- 12) In good conductors, rate of attenuation is  
a) Small                      b) Large  
c) Infinity                      d) Zero
- 13) The normal components of D are \_\_\_\_\_ across a dielectric boundary  
a) discontinuous                      b) continuous  
c) zero                      d)  $\infty$
- 14) "The total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed". This statement is associated with  
a) Coulomb's square law                      b) Gauss's law  
c) Maxwell's first law                      d) Maxwell's second law

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Set Q
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**T.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Three.** **12**

- State and explain Coulomb's law.
- Two charges  $Q_1 = 300\mu\text{C}$  &  $Q_2 = -40\mu\text{C}$  are placed at (1, -1, -3) m and at (3, -3, -2) m. Find the force acting on charge  $Q_1$  due to charge  $Q_2$ .
- State and verify Ampere's Circuital Law.
- If  $\vec{D} = 2xy\vec{a}_x + x^2y\vec{a}_y$  (C/m<sup>2</sup>) and the rectangular parallelepiped formed by the planes  $x = 0$  &  $x = 1$ ,  $y = 0$  &  $y = 2$  and  $z = 0$  &  $z = 3$ . Apply divergence theorem to find out the charge.

**Q.3 Attempt any two.** **16**

- Given a dipole at origin in free space has a moment of  $400\pi \epsilon_0 (0.6\vec{a}_x - 0.75\vec{a}_y + 0.8\vec{a}_z)$  C.m. Find the potential at i) (0,5,0) ii) (2,3,4).
- Derive the boundary conditions of electrostatic fields for conductor-free space medium.
- State and prove point form of Gauss' Law.

**Section – II**

**Q.4 Attempt any Three.** **12**

- State and derive the Maxwell's equations of Faraday's law and Ampere's law for static fields.
- Define following parameters of transmission line
  - Characteristic Impedance
  - Propagation constant
  - Reflection coefficient
  - Transmission coefficient
- Derive the wave equation for electric field for lossless media by using Maxwell's equation  $\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$ .
- Derive the transmission line equation in terms of voltage.

**Q.5 Attempt any two.** **16**

- State and derive Poynting theorem.
- If the field quantities  $\vec{E} = 2 \sin x \cdot \sin t \vec{a}_y$  and  $\vec{H} = \frac{2}{\mu_0} \cos x \cdot \cos t \vec{a}_z$  are given. Verify whether the given pairs of fields satisfy Maxwell's equations or not.
- What is Smith chart & how it is constructed? Write the applications of Smith chart.

Seat No.	
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Set	R
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**T.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The propagation of the electromagnetic waves can be illustrated by
  - a) Faraday law
  - b) Ampere law
  - c) Fleming rule
  - d) Coulomb law
- 2) The Stoke's theorem uses which of the following operation?
  - a) Divergence
  - b) Gradient
  - c) Curl
  - d) Laplacian
- 3) The Poynting vector is the power component that is calculated by the
  - a) Product of E and H
  - b) Ratio of E and H
  - c) Dot product of E and H
  - d) Cross product of E and H
- 4) The potential due to a dipole at a point P from it is the
  - a) Sum of potentials at the charges
  - b) Difference of potentials at the charges
  - c) Multiplication of potentials at the charges
  - d) Ratio of potentials at the charges
- 5) Total flux passing through a closed surface held in a magnetic field is
  - a) Infinity
  - b) Zero
  - c) Unity
  - d) None of these
- 6) Energy density is given as \_\_\_\_\_.
  - a) Energy per unit volume
  - b) Energy per unit area
  - c) Linear energy
  - d) All of these
- 7) Surface integral with volume integral relation is given by
  - a) Divergence theorem
  - b) Ampere's law
  - c) Poynting Theorem
  - d) Coulomb's law
- 8) According to Maxwell's first equation in differential form gives
  - a)  $\nabla \cdot D = \rho_v$
  - b)  $\int D ds = \int (\nabla \cdot D) dv$
  - c)  $\int H dl = \int (\nabla \times H) ds$
  - d)  $\nabla \times H = J_c + J_d$
- 9) In good conductors, rate of attenuation is
  - a) Small
  - b) Large
  - c) Infinity
  - d) Zero

- 10)** The normal components of  $D$  are \_\_\_\_\_ across a dielectric boundary
- a) discontinuous
  - b) continuous
  - c) zero
  - d)  $\infty$
- 11)** "The total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed". This statement is associated with
- a) Coulomb's square law
  - b) Gauss's law
  - c) Maxwell's first law
  - d) Maxwell's second law
- 12)** The lines having  $R$ ,  $L$ ,  $C$  distributed along the circuit are called
- a) Lumped
  - b) Distributed
  - c) Parallel
  - d) Paired
- 13)** The characteristic impedance of a transmission line with impedance and admittance of 16 and 9 respectively is
- a) 25
  - b) 7
  - c) 1.33
  - d) 0.75
- 14)** If potential of 1V is applied across a capacitor of 10pF, the energy stored is
- a) zero
  - b) 2.5 pJ
  - c) 10 pJ
  - d) 5 pJ

Seat No.	
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Set	R
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**T.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Three.** **12**

- State and explain Coulomb's law.
- Two charges  $Q_1 = 300\mu\text{C}$  &  $Q_2 = -40\mu\text{C}$  are placed at (1, -1, -3) m and at (3, -3, -2) m. Find the force acting on charge  $Q_1$  due to charge  $Q_2$ .
- State and verify Ampere's Circuital Law.
- If  $\vec{D} = 2xy\vec{a}_x + x^2y\vec{a}_y$  (C/m<sup>2</sup>) and the rectangular parallelepiped formed by the planes  $x = 0$  &  $x = 1$ ,  $y = 0$  &  $y = 2$  and  $z = 0$  &  $z = 3$ . Apply divergence theorem to find out the charge.

**Q.3 Attempt any two.** **16**

- Given a dipole at origin in free space has a moment of  $400\pi \epsilon_0 (0.6\vec{a}_x - 0.75\vec{a}_y + 0.8\vec{a}_z)$  C.m. Find the potential at i) (0,5,0) ii) (2,3,4).
- Derive the boundary conditions of electrostatic fields for conductor-free space medium.
- State and prove point form of Gauss' Law.

**Section – II**

**Q.4 Attempt any Three.** **12**

- State and derive the Maxwell's equations of Faraday's law and Ampere's law for static fields.
- Define following parameters of transmission line
  - Characteristic Impedance
  - Propagation constant
  - Reflection coefficient
  - Transmission coefficient
- Derive the wave equation for electric field for lossless media by using Maxwell's equation  $\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$ .
- Derive the transmission line equation in terms of voltage.

**Q.5 Attempt any two.** **16**

- State and derive Poynting theorem.
- If the field quantities  $\vec{E} = 2 \sin x \cdot \sin t \vec{a}_y$  and  $\vec{H} = \frac{2}{\mu_0} \cos x \cdot \cos t \vec{a}_z$  are given. Verify whether the given pairs of fields satisfy Maxwell's equations or not.
- What is Smith chart & how it is constructed? Write the applications of Smith chart.



Seat No.	
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Set	S
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**T.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The normal components of D are \_\_\_\_\_ across a dielectric boundary
  - a) discontinuous
  - b) continuous
  - c) zero
  - d)  $\infty$
- 2) "The total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed". This statement is associated with
  - a) Coulomb's square law
  - b) Gauss's law
  - c) Maxwell's first law
  - d) Maxwell's second law
- 3) The lines having R, L, C distributed along the circuit are called
  - a) Lumped
  - b) Distributed
  - c) Parallel
  - d) Paired
- 4) The characteristic impedance of a transmission line with impedance and admittance of 16 and 9 respectively is
  - a) 25
  - b) 7
  - c) 1.33
  - d) 0.75
- 5) If potential of 1V is applied across a capacitor of 10pF, the energy stored is
  - a) zero
  - b) 2.5 pJ
  - c) 10 pJ
  - d) 5 pJ
- 6) The propagation of the electromagnetic waves can be illustrated by
  - a) Faraday law
  - b) Ampere law
  - c) Fleming rule
  - d) Coulomb law
- 7) The Stoke's theorem uses which of the following operation?
  - a) Divergence
  - b) Gradient
  - c) Curl
  - d) Laplacian
- 8) The Poynting vector is the power component that is calculated by the
  - a) Product of E and H
  - b) Ratio of E and H
  - c) Dot product of E and H
  - d) Cross product of E and H

- 9) The potential due to a dipole at a point P from it is the  
a) Sum of potentials at the charges  
b) Difference of potentials at the charges  
c) Multiplication of potentials at the charges  
d) Ratio of potentials at the charges
- 10) Total flux passing through a closed surface held in a magnetic field is  
a) Infinity  
b) Zero  
c) Unity  
d) None of these
- 11) Energy density is given as \_\_\_\_\_.  
a) Energy per unit volume  
b) Energy per unit area  
c) Linear energy  
d) All of these
- 12) Surface integral with volume integral relation is given by  
a) Divergence theorem  
b) Ampere's law  
c) Poynting Theorem  
d) Coulomb's law
- 13) According to Maxwell's first equation in differential form gives  
a)  $\nabla \cdot D = \rho_v$   
b)  $\int D ds = \int (\nabla \cdot D) dv$   
c)  $\int H dl = \int (\nabla \times H) ds$   
d)  $\nabla \times H = J_c + J_d$
- 14) In good conductors, rate of attenuation is  
a) Small  
b) Large  
c) Infinity  
d) Zero

Seat No.	
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Set	S
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**T.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electromagnetic Field Theory**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Three.** **12**

- State and explain Coulomb's law.
- Two charges  $Q_1 = 300\mu\text{C}$  &  $Q_2 = -40\mu\text{C}$  are placed at (1, -1, -3) m and at (3, -3, -2) m. Find the force acting on charge  $Q_1$  due to charge  $Q_2$ .
- State and verify Ampere's Circuital Law.
- If  $\vec{D} = 2xy\vec{a}_x + x^2\vec{a}_y$  (C/m<sup>2</sup>) and the rectangular parallelepiped formed by the planes  $x = 0$  &  $x = 1$ ,  $y = 0$  &  $y = 2$  and  $z = 0$  &  $z = 3$ . Apply divergence theorem to find out the charge.

**Q.3 Attempt any two.** **16**

- Given a dipole at origin in free space has a moment of  $400\pi \epsilon_0$  ( $0.6\vec{a}_x - 0.75\vec{a}_y + 0.8\vec{a}_z$ ) C.m. Find the potential at i) (0,5,0) ii) (2,3,4).
- Derive the boundary conditions of electrostatic fields for conductor-free space medium.
- State and prove point form of Gauss' Law.

**Section – II**

**Q.4 Attempt any Three.** **12**

- State and derive the Maxwell's equations of Faraday's law and Ampere's law for static fields.
- Define following parameters of transmission line
  - Characteristic Impedance
  - Propagation constant
  - Reflection coefficient
  - Transmission coefficient
- Derive the wave equation for electric field for lossless media by using Maxwell's equation  $\nabla \times \vec{E} = -\dot{\vec{B}}$ .
- Derive the transmission line equation in terms of voltage.

**Q.5 Attempt any two.** **16**

- State and derive Poynting theorem.
- If the field quantities  $\vec{E} = 2 \sin x \cdot \sin t \vec{a}_y$  and  $\vec{H} = \frac{2}{\mu_0} \cos x \cdot \cos t \vec{a}_z$  are given. Verify whether the given pairs of fields satisfy Maxwell's equations or not.
- What is Smith chart & how it is constructed? Write the applications of Smith chart.

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Digital Design and HDL**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct option.**

14

- 1) Select which is the correct statement
  - a) A single architecture can have multiple entity
  - b) A single entity can have multiple architecture
  - c) A single entity can have only one architecture
  - d) none of these
- 2) Which of the delay statements are not valid
  - a)  $z \leq x$  and  $y$  after 5 NS;
  - b)  $z \leq \text{transport not } ((x \text{ and } y) \text{ or } (a \text{ and } b))$  after 8 NS;
  - c)  $z \leq x$  after 4 NS, not  $x$  after 8 NS;
  - d) none of these
- 3) A buffer with single input A and single output B has a delay of 20 nanosecond. If the value of input A changes after 10 ns from 0 to 1 and it changes again from 1 to 0 at 20 ns. At what time, the value of output B will be 1, if the transport delay model is used?
  - a) 20 ns
  - b) 30 ns
  - c) 40 ns
  - d) Output will remain zero
- 4) Which is the correct entity representation for the two input NAND gate shown below?



- a) NAND 5 entity is  
port (A, B : input;  
C: output); NAND 5 end;
- b) entity NAND5 is  
port (A, B : in bit;  
C: out bit);  
end NAND5;
- c) Entity: NAND5 is  
port(Inputs: A, B;  
Output: C);  
end;

- d) entity : NAND5  
port( inbit: A,B),  
(outbit: C);  
end.
- 5) Binary multiplication requires\_\_\_\_\_
- |                        |                      |
|------------------------|----------------------|
| a) Shifting            | b) BCD addition      |
| c) Shifting and adding | d) None of the above |
- 6) The Verilog HDL code starts with the keyword\_\_\_\_\_
- |               |           |
|---------------|-----------|
| a) always     | b) module |
| c) end module | d) items  |
- 7) #40 \$finish indicates\_\_\_\_\_
- |  |
|--|
| a) end of simulation time              |
| b) end of simulation at 40 time units  |
| c) suspend simulation at 40 time units |
| d) None                                |
- 8) If A=4'b1010 and B=4'b1100 then A&B
- |            |            |
|------------|------------|
| a) 4'b0000 | b) 4'b1000 |
| c) 1'b1    | d) 1'b0    |
- 9) Which of the following is correct syntax for component declaration?
- |  |
|--|
| a) COMPONENT component_name IS<br>PORT ( port_mode : type port_name;<br>port_mode : type port_name;<br>....);<br>END component_name; |
| b) COMPONENT component_name IS<br>PORT ( port_mode : type port_name;<br>port_mode : type port_name;<br>.....);<br>END COMPONENT;     |
| c) COMPONENT component_name IS<br>PORT ( port_name : mode type;<br>port_name : mode type;<br>.....);<br>END component_name;          |
| d) COMPONENT component name IS<br>PORT ( port_name : mode type;<br>port_name : mode type;<br>....);<br>END COMPONENT;                |
- 10) A ripple counter is \_\_\_\_\_ sequential circuit.
- |                 |                |
|-----------------|----------------|
| a) Reset        | b) Synchronous |
| c) Asynchronous | d) Logic       |
- 11) In FSM diagram what does circle represent?
- |                    |                  |
|--------------------|------------------|
| a) Change of state | b) State         |
| c) Output value    | d) Initial state |

- 12) Moore machine has \_\_\_\_\_ states than a mealy machine.
  - a) Fewer
  - b) More
  - c) Equal
  - d) Negligible
- 13) The boundary scan path is provided with
  - a) serial input pads
  - b) parallel input pads
  - c) parallel output pads
  - d) buffer pads
- 14) SPLDs, CPLDs, and FPGAs are all which type of device?
  - a) PAL
  - b) PLD
  - c) EPROM
  - d) SRAM

<b>Seat No.</b>	
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**Set****P**

**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Digital Design and HDL**

Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any four** **16**

- a) With the help of Flow Chart, explain different steps involved in VLSI design flow.
- b) Design a VHDL module for 3:8 decoder using behavioral architecture style.
- c) What are delays used in VHDL? Explain with example.
- d) Design a Verilog module for full adder.
- e) Explain various attributes in VHDL.

**Q.3 Answer any Two** **12**

- a) Design a 4:1 mux using data flow and behavioral modeling. Comment on the performance of this multiplexer using both the modeling style.
- b) Design a VHDL module to realize mod 6 up down counter with asynchronous reset.
- c) With example, explain the concept of operator overloading in VHDL.

**Section – II**

**Q.4 Answer any four** **16**

- a) Draw state diagram and Design a VHDL module for D flip flop.
- b) Explain the testing process using Built-In-Self test.
- c) Write a VHDL test bench for half adder.
- d) Draw Macrocell and explain its working.
- e) Draw state diagram and Design a VHDL module for detecting a sequence 111 using Mealy model.

**Q.5 Answer any Two** **12**

- a) Draw block diagram and explain Embedded Array Block (EAB) of Flex 10 K.
- b) Draw state diagram and Design a VHDL module to realize ADD and SHIFT multiplier.
- c) Explain testing of combinational and sequential logic.

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Digital Design and HDL**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct option.**

14

- 1) If  $A=4'b1010$  and  $B=4'b1100$  then  $A \& B$ 
  - a)  $4'b0000$
  - b)  $4'b1000$
  - c)  $1'b1$
  - d)  $1'b0$
- 2) Which of the following is correct syntax for component declaration?
  - a) COMPONENT component\_name IS  
 PORT ( port\_mode : type port\_name;  
 port\_mode : type port\_name;  
 ....);  
 END component\_name;
  - b) COMPONENT component\_name IS  
 PORT ( port\_mode : type port\_name;  
 port\_mode : type port\_name;  
 .....);  
 END COMPONENT;
  - c) COMPONENT component\_name IS  
 PORT ( port\_name : mode type;  
 port\_name : mode type;  
 .....);  
 END component\_name;
  - d) COMPONENT component name IS  
 PORT ( port\_name : mode type;  
 port\_name : mode type;  
 ....);  
 END COMPONENT;
- 3) A ripple counter is \_\_\_\_\_ sequential circuit.
  - a) Reset
  - b) Synchronous
  - c) Asynchronous
  - d) Logic
- 4) In FSM diagram what does circle represent?
  - a) Change of state
  - b) State
  - c) Output value
  - d) Initial state



- 
- A logic diagram of a NAND gate. It has two inputs, A and B, on the left. The gate symbol is a D-shaped rectangle with a small circle (bubble) at the output. The output is labeled C on the right.

- Page 6 of 16

- 13)** The Verilog HDL code starts with the keyword\_\_\_\_\_
- |               |           |
|---------------|-----------|
| a) always     | b) module |
| c) end module | d) items  |
- 14)** #40 \$finish indicates\_\_\_\_\_
- a) end of simulation time
  - b) end of simulation at 40 time units
  - c) suspend simulation at 40 time units
  - d) None

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Digital Design and HDL**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any four** **16**

- a) With the help of Flow Chart, explain different steps involved in VLSI design flow.
- b) Design a VHDL module for 3:8 decoder using behavioral architecture style.
- c) What are delays used in VHDL? Explain with example.
- d) Design a Verilog module for full adder.
- e) Explain various attributes in VHDL.

**Q.3 Answer any Two** **12**

- a) Design a 4:1 mux using data flow and behavioral modeling. Comment on the performance of this multiplexer using both the modeling style.
- b) Design a VHDL module to realize mod 6 up down counter with asynchronous reset.
- c) With example, explain the concept of operator overloading in VHDL.

**Section – II**

**Q.4 Answer any four** **16**

- a) Draw state diagram and Design a VHDL module for D flip flop.
- b) Explain the testing process using Built-In-Self test.
- c) Write a VHDL test bench for half adder.
- d) Draw Macrocell and explain its working.
- e) Draw state diagram and Design a VHDL module for detecting a sequence 111 using Mealy model.

**Q.5 Answer any Two** **12**

- a) Draw block diagram and explain Embedded Array Block (EAB) of Flex 10 K.
- b) Draw state diagram and Design a VHDL module to realize ADD and SHIFT multiplier.
- c) Explain testing of combinational and sequential logic.

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Digital Design and HDL**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct option.**

14

- 1) In FSM diagram what does circle represent?
  - a) Change of state
  - b) State
  - c) Output value
  - d) Initial state
- 2) Moore machine has \_\_\_\_\_ states than a mealy machine.
  - a) Fewer
  - b) More
  - c) Equal
  - d) Negligible
- 3) The boundary scan path is provided with
  - a) serial input pads
  - b) parallel input pads
  - c) parallel output pads
  - d) buffer pads
- 4) SPLDs, CPLDs, and FPGAs are all which type of device?
  - a) PAL
  - b) PLD
  - c) EPROM
  - d) SRAM
- 5) Select which is the correct statement
  - a) A single architecture can have multiple entity
  - b) A single entity can have multiple architecture
  - c) A single entity can have only one architecture
  - d) none of these
- 6) Which of the delay statements are not valid
  - a)  $z \leq x$  and  $y$  after 5 NS;
  - b)  $z \leq \text{transport not } ((x \text{ and } y) \text{ or } (a \text{ and } b))$  after 8 NS;
  - c)  $z \leq x$  after 4 NS, not  $x$  after 8 NS;
  - d) none of these
- 7) A buffer with single input A and single output B has a delay of 20 nanosecond. If the value of input A changes after 10 ns from 0 to 1 and it changes again from 1 to 0 at 20 ns. At what time, the value of output B will be 1, if the transport delay model is used?
  - a) 20 ns
  - b) 30 ns
  - c) 40 ns
  - d) Output will remain zero

- 8) Which is the correct entity representation for the two input NAND gate shown below?



- a) NAND 5 entity is  
port (A, B : input;  
C: output); NAND 5 end;
  - b) entity NAND5 is  
port (A, B : in bit;  
C: out bit);  
end NAND5;
  - c) Entity: NAND5 is  
port(Inputs: A, B;  
Output: C);  
end;
  - d) entity : NAND5  
port( inbit: A,B),  
(outbit: C);  
end.
- 9) Binary multiplication requires\_\_\_\_\_
- a) Shifting
  - b) BCD addition
  - c) Shifting and adding
  - d) None of the above
- 10) The Verilog HDL code starts with the keyword\_\_\_\_\_
- a) always
  - b) module
  - c) end module
  - d) items
- 11) #40 \$finish indicates\_\_\_\_\_
- a) end of simulation time
  - b) end of simulation at 40 time units
  - c) suspend simulation at 40 time units
  - d) None
- 12) If  $A = 4'b1010$  and  $B = 4'b1100$  then  $A \& B$
- a) 4'b0000
  - b) 4'b1000
  - c) 1'b1
  - d) 1'b0
- 13) Which of the following is correct syntax for component declaration?
- a) COMPONENT component\_name IS  
PORT ( port\_mode : type port\_name;  
port\_mode : type port\_name;  
....);  
END component\_name;
  - b) COMPONENT component\_name IS  
PORT ( port\_mode : type port\_name;  
port\_mode : type port\_name;  
.....);  
END COMPONENT;

- c) COMPONENT component\_name IS  
PORT ( port\_name : mode type;  
port\_name : mode type;  
.....);  
END component\_name;
  - d) COMPONENT component name IS  
PORT ( port\_name : mode type;  
port\_name : mode type;  
.....);  
END COMPONENT;
- 14)** A ripple counter is \_\_\_\_\_ sequential circuit.
- |                 |                |
|-----------------|----------------|
| a) Reset        | b) Synchronous |
| c) Asynchronous | d) Logic       |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Digital Design and HDL**

Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any four** **16**

- a) With the help of Flow Chart, explain different steps involved in VLSI design flow.
- b) Design a VHDL module for 3:8 decoder using behavioral architecture style.
- c) What are delays used in VHDL? Explain with example.
- d) Design a Verilog module for full adder.
- e) Explain various attributes in VHDL.

**Q.3 Answer any Two** **12**

- a) Design a 4:1 mux using data flow and behavioral modeling. Comment on the performance of this multiplexer using both the modeling style.
- b) Design a VHDL module to realize mod 6 up down counter with asynchronous reset.
- c) With example, explain the concept of operator overloading in VHDL.

**Section – II**

**Q.4 Answer any four** **16**

- a) Draw state diagram and Design a VHDL module for D flip flop.
- b) Explain the testing process using Built-In-Self test.
- c) Write a VHDL test bench for half adder.
- d) Draw Macrocell and explain its working.
- e) Draw state diagram and Design a VHDL module for detecting a sequence 111 using Mealy model.

**Q.5 Answer any Two** **12**

- a) Draw block diagram and explain Embedded Array Block (EAB) of Flex 10 K.
- b) Draw state diagram and Design a VHDL module to realize ADD and SHIFT multiplier.
- c) Explain testing of combinational and sequential logic.

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Digital Design and HDL**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct option.**

14

- 1) The Verilog HDL code starts with the keyword\_\_\_\_
  - a) always
  - b) module
  - c) end module
  - d) items
- 2) #40 \$finish indicates\_\_\_\_\_
  - a) end of simulation time
  - b) end of simulation at 40 time units
  - c) suspend simulation at 40 time units
  - d) None
- 3) If A=4'b1010 and B=4'b1100 then A&B
  - a) 4'b0000
  - b) 4'b1000
  - c) 1'b1
  - d) 1'b0
- 4) Which of the following is correct syntax for component declaration?
  - a) COMPONENT component\_name IS  
 PORT ( port\_mode : type port\_name;  
 port\_mode : type port\_name;  
 ....);  
 END component\_name;
  - b) COMPONENT component\_name IS  
 PORT ( port\_mode : type port\_name;  
 port\_mode : type port\_name;  
 .....);  
 END COMPONENT;
  - c) COMPONENT component\_name IS  
 PORT ( port\_name : mode type;  
 port\_name : mode type;  
 .....);  
 END component\_name;



- 
- A logic diagram of a NAND gate. It has two inputs, A and B, on the left. The gate is represented by a D-shaped symbol with a small circle at the output. The output is labeled C on the right.

- Page 14 of 16

- c) Entity: NAND5 is  
port(Inputs: A, B;  
Output: C);  
end;
  - d) entity : NAND5  
port( inbit: A,B),  
(outbit: C);  
end.
- 14)** Binary multiplication requires\_\_\_\_\_
- a) Shifting
  - b) BCD addition
  - c) Shifting and adding
  - d) None of the above

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem – I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Digital Design and HDL**

Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any four** **16**

- a) With the help of Flow Chart, explain different steps involved in VLSI design flow.
- b) Design a VHDL module for 3:8 decoder using behavioral architecture style.
- c) What are delays used in VHDL? Explain with example.
- d) Design a Verilog module for full adder.
- e) Explain various attributes in VHDL.

**Q.3 Answer any Two** **12**

- a) Design a 4:1 mux using data flow and behavioral modeling. Comment on the performance of this multiplexer using both the modeling style.
- b) Design a VHDL module to realize mod 6 up down counter with asynchronous reset.
- c) With example, explain the concept of operator overloading in VHDL.

**Section – II**

**Q.4 Answer any four** **16**

- a) Draw state diagram and Design a VHDL module for D flip flop.
- b) Explain the testing process using Built-In-Self test.
- c) Write a VHDL test bench for half adder.
- d) Draw Macrocell and explain its working.
- e) Draw state diagram and Design a VHDL module for detecting a sequence 111 using Mealy model.

**Q.5 Answer any Two** **12**

- a) Draw block diagram and explain Embedded Array Block (EAB) of Flex 10 K.
- b) Draw state diagram and Design a VHDL module to realize ADD and SHIFT multiplier.
- c) Explain testing of combinational and sequential logic.

<b>Seat No.</b>	
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- 10)** Convolution of ideal filter response and sinc function results in  
a) side lobes oscillations      b) main lobe oscillations  
c) sharpening of transition width      d) decrease in main lobe width
- 11)** IIR digital filters are of the nature  
a) Recursive      b) Non recursive  
c) Both      d) None
- 12)** To avoid aliasing of frequency components which method is useful in designing filter  
a) impulse invariant      b) bilinear transformation  
c) Windowing techniques      d) None
- 13)** In the FIR realization methods, the following method requires minimum number of multipliers  
a) Cascade      b) Direct Form  
c) Lattice      d) Linear phase
- 14)** The factor that influence the choice of realization of structure is  
a) Memory requirement      b) Computational complexity  
c) Parallel processing      d) All of the above

Seat No.	
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Set	P
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**T. Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section - I**

**Q.2 Attempt any Four.** **16**

- Determine DFT of  $x[n]$  if  $x[n] = \{0, 1, 2, 3\}$  using definition of DFT.
- Find Cross correlation of sequence  $x[n] = \{2, 1, 2, 4\}$  &  $y[n] = \{1, 2, 3, 1\}$ .
- Find linearity of system i)  $y[n] = x^2[n]$  ii)  $y[n] = n x[n]$ ,
- Find 4 point DFT of  $x[n] = \{1, -1, 1, -1\}$  using DIF algorithm.
- Determine circular convolution using concentric circle method  
 $x[n] = \{1, 2, 3, 1\}$  &  $h[n] = \{4, 3, 2, 2\}$ .

**Q.3 Attempt any one full question.** **12**

- Find linear convolution of the following sequences using Overlap Save Method.  $x[n] = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$  &  $h[n] = \{1, 1, 1\}$ .
  - Differentiate between Circular & Linear convolution.
- Find  $x(n)$  using DIT FFT where  $X(n) = \{1, 0, 2, 0, 3, 0, 4, 0\}$ .
  - Explain similarities & differences between DIF & DIT algorithms.

**Section – II**

**Q.4 Attempt any four:** **16**

- Give the equation specifying Bartlett, Hamming and rectangular window.
- By impulse invariance method obtain the digital filter transfer function  $H(z)$   
 $H(s) = 2/(s + 1)(s + 2)$  for  $T=1$  sec
- Explain the characteristics of Analog low pass Butterworth filter.
- Realize the system in cascade form  $H(Z) = \frac{1 + \frac{1}{2}Z^{-1}}{(1 - Z^{-1} + \frac{1}{4}Z^{-2})(1 - Z^{-1} + \frac{1}{2}Z^{-2})}$
- Explain the application of DSP in telecommunication in detail.

**Q.5 Attempt any one full question:** **12**

- Design an ideal low pass filter using Fourier method whose desired frequency response is

$$H_d(e^{jw}) = 1 \quad \text{for } \frac{\pi}{4} \leq |w| \leq \pi$$

$$= 0 \quad \text{for } |w| \leq \frac{\pi}{4}$$

Determine the impulse response  $h(n)$  for  $N = 11$ . Determine  $H(Z)$  &  $H'(Z)$ .

- Explain finite word length effect of FIR filter.
- Obtain cascade form realization of the system function  
 $H(Z) = (1 + 2Z^{-1} - Z^{-2})(1 + Z^{-1} - Z^{-2})$
    - Consider an FIR lattice filter with coefficients  $k_1 = \frac{1}{4}$ ;  $k_2 = \frac{1}{4}$ ;  $k_3 = \frac{1}{3}$   
 Determine the FIR filter coefficients direct form structure.

Seat No.	
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Set Q
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**T. Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Bilinear transformation mapping is
  - a) One to one
  - b) Many to one
  - c) Many to Many
  - d) One to Many
- 2) Which of the following filter have linear phase characteristic
  - a) IIR
  - b) LP
  - c) HP
  - d) FIR
- 3) Convolution of ideal filter response and sinc function results in
  - a) side lobes oscillations
  - b) main lobe oscillations
  - c) sharpening of transition width
  - d) decrease in main lobe width
- 4) IIR digital filters are of the nature
  - a) Recursive
  - b) Non recursive
  - c) Both
  - d) None
- 5) To avoid aliasing of frequency components which method is useful in designing filter
  - a) impulse invariant
  - b) bilinear transformation
  - c) Windowing techniques
  - d) None
- 6) In the FIR realization methods, the following method requires minimum number of multipliers
  - a) Cascade
  - b) Direct Form
  - c) Lattice
  - d) Linear phase
- 7) The factor that influence the choice of realization of structure is
  - a) Memory requirement
  - b) Computational complexity
  - c) Parallel processing
  - d) All of the above
- 8) If  $X(k)$  is  $N$  point DFT of sequence  $x(n)$  then what is DFT of  $x^*(n)$ ?
  - a)  $X^*(N-k)$
  - b)  $X^*(k)$
  - c)  $X^*(N-k)$
  - d) None of these
- 9) The zero padding is used for better display of
  - a) Time domain signal
  - b) Frequency Spectrum
  - c) both a & b
  - d) None of these

- 10) For calculating DFT, DIT algorithm is related to
  - a)  $X(k)$  shuffled
  - b)  $x(n)$  shuffled
  - c) both a & b
  - d) None of these
- 11) In overlap save method of long sequence filtering what is the length of the input sequence block?
  - a)  $L + M + 1$
  - b)  $L + M$
  - c)  $L + M - 1$
  - d) None of these
- 12) Correlation is basically used to \_\_\_\_\_ two signals.
  - a) Add
  - b) Subtract
  - c) Compare
  - d) None of these
- 13) No. of complex Multiplication required to compute  $N$  point DFT using DIF are.
  - a)  $N \log_2 N$
  - b)  $(N/2) * \log_2 N$
  - c)  $N^2$
  - d)  $N(N - 1)$
- 14) The circular convolution of  $\{0, 1, 2\}$  &  $\{1, 1, 0\}$  is
  - a)  $\{0, 2, 3\}$
  - b)  $\{1, 2, 3\}$
  - c)  $\{1, 1, 1\}$
  - d)  $\{2, 1, 3\}$



Seat No.	
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Set **Q**

**T. Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section - I****Q.2 Attempt any Four.****16**

- Determine DFT of  $x[n]$  if  $x[n] = \{0, 1, 2, 3\}$  using definition of DFT.
- Find Cross correlation of sequence  $x[n] = \{2, 1, 2, 4\}$  &  $y[n] = \{1, 2, 3, 1\}$ .
- Find linearity of system i)  $y[n] = x^2[n]$  ii)  $y[n] = n x[n]$ ,
- Find 4 point DFT of  $x[n] = \{1, -1, 1, -1\}$  using DIF algorithm.
- Determine circular convolution using concentric circle method  $x[n] = \{1, 2, 3, 1\}$  &  $h[n] = \{4, 3, 2, 2\}$ .

**Q.3 Attempt any one full question.****12**

- Find linear convolution of the following sequences using Overlap Save Method.  $x[n] = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$  &  $h[n] = \{1, 1, 1\}$ .
  - Differentiate between Circular & Linear convolution.
- Find  $x(n)$  using DIT FFT where  $X(n) = \{1, 0, 2, 0, 3, 0, 4, 0\}$ .
  - Explain similarities & differences between DIF & DIT algorithms.

**Section – II****Q.4 Attempt any four:****16**

- Give the equation specifying Bartlett, Hamming and rectangular window.
- By impulse invariance method obtain the digital filter transfer function  $H(z)$   $H(s) = 2/(s + 1)(s + 2)$  for  $T=1$  sec
- Explain the characteristics of Analog low pass Butterworth filter.
- Realize the system in cascade form  $H(Z) = \frac{1 + \frac{1}{2}Z^{-1}}{(1 - Z^{-1} + \frac{1}{4}Z^{-2})(1 - Z^{-1} + \frac{1}{2}Z^{-2})}$
- Explain the application of DSP in telecommunication in detail.

**Q.5 Attempt any one full question:****12**

- Design an ideal low pass filter using Fourier method whose desired frequency response is

$$H_d(e^{jw}) = 1 \quad \text{for } \frac{\pi}{4} \leq |w| \leq \pi$$

$$= 0 \quad \text{for } |w| \leq \frac{\pi}{4}$$

Determine the impulse response  $h(n)$  for  $N = 11$ . Determine  $H(Z)$  &  $H'(Z)$ .

- Explain finite word length effect of FIR filter.
- Obtain cascade form realization of the system function  $H(Z) = (1 + 2Z^{-1} - Z^{-2})(1 + Z^{-1} - Z^{-2})$
    - Consider an FIR lattice filter with coefficients  $k_1 = \frac{1}{4}$ ;  $k_2 = \frac{1}{4}$ ;  $k_3 = \frac{1}{3}$   
 Determine the FIR filter coefficients direct form structure.

Seat No.	
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Set	R
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**T. Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) IIR digital filters are of the nature
  - a) Recursive
  - b) Non recursive
  - c) Both
  - d) None
- 2) To avoid aliasing of frequency components which method is useful in designing filter
  - a) impulse invariant
  - b) bilinear transformation
  - c) Windowing techniques
  - d) None
- 3) In the FIR realization methods, the following method requires minimum number of multipliers
  - a) Cascade
  - b) Direct Form
  - c) Lattice
  - d) Linear phase
- 4) The factor that influence the choice of realization of structure is
  - a) Memory requirement
  - b) Computational complexity
  - c) Parallel processing
  - d) All of the above
- 5) If  $X(k)$  is  $N$  point DFT of sequence  $x(n)$  then what is DFT of  $x^*(n)$ ?
  - a)  $X^*(N-k)$
  - b)  $X^*(k)$
  - c)  $X^*(N-k)$
  - d) None of these
- 6) The zero padding is used for better display of
  - a) Time domain signal
  - b) Frequency Spectrum
  - c) both a & b
  - d) None of these
- 7) For calculating DFT, DIT algorithm is related to
  - a)  $X(k)$  shuffled
  - b)  $x(n)$  shuffled
  - c) both a & b
  - d) None of these
- 8) In overlap save method of long sequence filtering what is the length of the input sequence block?
  - a)  $L + M + 1$
  - b)  $L + M$
  - c)  $L + M - 1$
  - d) None of these
- 9) Correlation is basically used to \_\_\_\_\_ two signals.
  - a) Add
  - b) Subtract
  - c) Compare
  - d) None of these

- 10)** No. of complex Multiplication required to compute N point DFT using DIF are.
- |                 |                       |
|-----------------|-----------------------|
| a) $N \log_2 N$ | b) $(N/2) * \log_2 N$ |
| c) $N^2$        | d) $N(N - 1)$         |
- 11)** The circular convolution of  $\{0, 1, 2\}$  &  $\{1, 1, 0\}$  is
- |                  |                  |
|------------------|------------------|
| a) $\{0, 2, 3\}$ | b) $\{1, 2, 3\}$ |
| c) $\{1, 1, 1\}$ | d) $\{2, 1, 3\}$ |
- 12)** Bilinear transformation mapping is
- |                 |                |
|-----------------|----------------|
| a) One to one   | b) Many to one |
| c) Many to Many | d) One to Many |
- 13)** Which of the following filter have linear phase characteristic
- |        |        |
|--------|--------|
| a) IIR | b) LP  |
| c) HP  | d) FIR |
- 14)** Convolution of ideal filter response and sinc function results in
- |                                   |                                |
|-----------------------------------|--------------------------------|
| a) side lobes oscillations        | b) main lobe oscillations      |
| c) sharpening of transition width | d) decrease in main lobe width |

Seat No.	
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Set **R**

**T. Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section - I**

**Q.2 Attempt any Four.** **16**

- Determine DFT of  $x[n]$  if  $x[n] = \{0, 1, 2, 3\}$  using definition of DFT.
- Find Cross correlation of sequence  $x[n] = \{2, 1, 2, 4\}$  &  $y[n] = \{1, 2, 3, 1\}$ .
- Find linearity of system i)  $y[n] = x^2[n]$  ii)  $y[n] = n x[n]$ ,
- Find 4 point DFT of  $x[n] = \{1, -1, 1, -1\}$  using DIF algorithm.
- Determine circular convolution using concentric circle method  
 $x[n] = \{1, 2, 3, 1\}$  &  $h[n] = \{4, 3, 2, 2\}$ .

**Q.3 Attempt any one full question.** **12**

- Find linear convolution of the following sequences using Overlap Save Method.  $x[n] = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$  &  $h[n] = \{1, 1, 1\}$ .
  - Differentiate between Circular & Linear convolution.
- Find  $x(n)$  using DIT FFT where  $X(n) = \{1, 0, 2, 0, 3, 0, 4, 0\}$ .
  - Explain similarities & differences between DIF & DIT algorithms.

**Section – II**

**Q.4 Attempt any four:** **16**

- Give the equation specifying Bartlett, Hamming and rectangular window.
- By impulse invariance method obtain the digital filter transfer function  $H(z)$   
 $H(s) = 2/(s + 1)(s + 2)$  for  $T=1$  sec
- Explain the characteristics of Analog low pass Butterworth filter.
- Realize the system in cascade form  $H(Z) = \frac{1 + \frac{1}{2}Z^{-1}}{(1 - Z^{-1} + \frac{1}{4}Z^{-2})(1 - Z^{-1} + \frac{1}{2}Z^{-2})}$
- Explain the application of DSP in telecommunication in detail.

**Q.5 Attempt any one full question:** **12**

- Design an ideal low pass filter using Fourier method whose desired frequency response is

$$H_d(e^{jw}) = 1 \quad \text{for } \frac{\pi}{4} \leq |w| \leq \pi$$

$$= 0 \quad \text{for } |w| \leq \frac{\pi}{4}$$

Determine the impulse response  $h(n)$  for  $N = 11$ . Determine  $H(Z)$  &  $H'(Z)$ .

- Explain finite word length effect of FIR filter.
- Obtain cascade form realization of the system function  
 $H(Z) = (1 + 2Z^{-1} - Z^{-2})(1 + Z^{-1} - Z^{-2})$
  - Consider an FIR lattice filter with coefficients  $k_1 = \frac{1}{4}$ ;  $k_2 = \frac{1}{4}$ ;  $k_3 = \frac{1}{3}$   
 Determine the FIR filter coefficients direct form structure.

Seat No.	
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Set	S
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**T. Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) No. of complex Multiplication required to compute N point DFT using DIF are.
 

a) $N \log_2 N$	b) $(N/2) * \log_2 N$
c) $N^2$	d) $N(N - 1)$
- 2) The circular convolution of  $\{0, 1, 2\}$  &  $\{1, 1, 0\}$  is
 

a) $\{0, 2, 3\}$	b) $\{1, 2, 3\}$
c) $\{1, 1, 1\}$	d) $\{2, 1, 3\}$
- 3) Bilinear transformation mapping is
 

a) One to one	b) Many to one
c) Many to Many	d) One to Many
- 4) Which of the following filter have linear phase characteristic
 

a) IIR	b) LP
c) HP	d) FIR
- 5) Convolution of ideal filter response and sinc function results in
 

a) side lobes oscillations	b) main lobe oscillations
c) sharpening of transition width	d) decrease in main lobe width
- 6) IIR digital filters are of the nature
 

a) Recursive	b) Non recursive
c) Both	d) None
- 7) To avoid aliasing of frequency components which method is useful in designing filter
 

a) impulse invariant	b) bilinear transformation
c) Windowing techniques	d) None
- 8) In the FIR realization methods, the following method requires minimum number of multipliers
 

a) Cascade	b) Direct Form
c) Lattice	d) Linear phase
- 9) The factor that influence the choice of realization of structure is
 

a) Memory requirement	b) Computational complexity
c) Parallel processing	d) All of the above

- 10) If  $X(k)$  is  $N$  point DFT of sequence  $x(n)$  then what is DFT of  $x^*(n)$ ?
  - a)  $X^*(N-k)$
  - b)  $X^*(k)$
  - c)  $X^*(N-k)$
  - d) None of these
- 11) The zero padding is used for better display of
  - a) Time domain signal
  - b) Frequency Spectrum
  - c) both a & b
  - d) None of these
- 12) For calculating DFT, DIT algorithm is related to
  - a)  $X(k)$  shuffled
  - b)  $x(n)$  shuffled
  - c) both a & b
  - d) None of these
- 13) In overlap save method of long sequence filtering what is the length of the input sequence block?
  - a)  $L + M + 1$
  - b)  $L + M$
  - c)  $L + M - 1$
  - d) None of these
- 14) Correlation is basically used to \_\_\_\_\_ two signals.
  - a) Add
  - b) Subtract
  - c) Compare
  - d) None of these

Seat No.	
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Set **S**

**T. Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION**  
**Digital Signal Processing**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section - I**

**Q.2 Attempt any Four.** **16**

- Determine DFT of  $x[n]$  if  $x[n] = \{0, 1, 2, 3\}$  using definition of DFT.
- Find Cross correlation of sequence  $x[n] = \{2, 1, 2, 4\}$  &  $y[n] = \{1, 2, 3, 1\}$ .
- Find linearity of system i)  $y[n] = x^2[n]$  ii)  $y[n] = n x[n]$ ,
- Find 4 point DFT of  $x[n] = \{1, -1, 1, -1\}$  using DIF algorithm.
- Determine circular convolution using concentric circle method  $x[n] = \{1, 2, 3, 1\}$  &  $h[n] = \{4, 3, 2, 2\}$ .

**Q.3 Attempt any one full question.** **12**

- Find linear convolution of the following sequences using Overlap Save Method.  $x[n] = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$  &  $h[n] = \{1, 1, 1\}$ .
  - Differentiate between Circular & Linear convolution.
- Find  $x(n)$  using DIT FFT where  $X(n) = \{1, 0, 2, 0, 3, 0, 4, 0\}$ .
  - Explain similarities & differences between DIF & DIT algorithms.

**Section – II**

**Q.4 Attempt any four:** **16**

- Give the equation specifying Bartlett, Hamming and rectangular window.
- By impulse invariance method obtain the digital filter transfer function  $H(z)$   $H(s) = 2/(s + 1)(s + 2)$  for  $T=1$  sec
- Explain the characteristics of Analog low pass Butterworth filter.
- Realize the system in cascade form  $H(Z) = \frac{1 + \frac{1}{2}Z^{-1}}{(1 - Z^{-1} + \frac{1}{4}Z^{-2})(1 - Z^{-1} + \frac{1}{2}Z^{-2})}$
- Explain the application of DSP in telecommunication in detail.

**Q.5 Attempt any one full question:** **12**

- Design an ideal low pass filter using Fourier method whose desired frequency response is

$$H_d(e^{jw}) = 1 \quad \text{for } \frac{\pi}{4} \leq |w| \leq \pi$$

$$= 0 \quad \text{for } |w| \leq \frac{\pi}{4}$$

Determine the impulse response  $h(n)$  for  $N = 11$ . Determine  $H(Z)$  &  $H'(Z)$ .

- Explain finite word length effect of FIR filter.
- Obtain cascade form realization of the system function  $H(Z) = (1 + 2Z^{-1} - Z^{-2})(1 + Z^{-1} - Z^{-2})$
    - Consider an FIR lattice filter with coefficients  $k_1 = \frac{1}{4}$ ;  $k_2 = \frac{1}{4}$ ;  $k_3 = \frac{1}{3}$   
 Determine the FIR filter coefficients direct form structure.

<b>Seat No.</b>	
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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.

Marks: 14

14

- 1) The internal RAM memory of the 8051 is\_\_\_\_\_

a) 32 bytes                                      b) 64 bytes  
c) 128 bytes                                     d) 256 bytes
- 2) The 8051 has \_\_\_\_\_ 16-bit counter/timers.

a) 2    b) 1  
c) 4    d) 3
- 3) Data transfer from I/O to external data memory can only be done with the MOVX command.

a) True    b) False
- 4) In UART, \_\_\_\_\_ register is used as Transmit Status and Control Register

a) RCSTA    b) TXREG  
c) TXSTA    d) RCREG
- 5) In PIC16F877A, \_\_\_\_\_ bit resolution ADC is available.

a) 10    b) 8  
c) 4    d) 1
- 6) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXX on the basis of instructions execution?

a) Carry Flag                                        b) Zero Flag  
c) Digit Carry Flag                                d) All of the above
- 7) Address assigned to INTI & Timer 1 interrupts are\_\_\_\_\_

a) 0013H & 001BH                              b) 001BH & 0013H  
c) 0003H & 000BH                              d) 0013H & 0023H



- 8) When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?
- a) PSW
  - b) SP
  - c) DPTR
  - d) PC
- 9) An alternate function of port pin P3.4 in the 8051 is:
- a) Timer 0
  - b) Timer 1
  - c) interrupt 0
  - d) interrupt 1
- 10) PSEN stands for \_\_\_\_\_
- a) Program Select Enable
  - b) Peripheral Store Enable
  - c) Program Store Enable
  - d) Peripheral Select Enable
- 11) How many rows and columns are present in a 16\*2 alphanumeric LCD?
- a) rows=2, columns=32
  - b) rows=16, columns=2
  - c) rows=16, columns=16
  - d) rows=2, columns=16
- 12) For writing commands on an LCD, RS bit is
- a) set
  - b) reset
  - c) set & reset
  - d) none of the mentioned
- 13) What is the purpose of a special function register SPBRG in USART?
- a) To control the operation associated with baud rate generation
  - b) To control an oscillator frequency
  - c) To control or prevent the false bit transmission of 9<sup>th</sup> bit
  - d) All of the above
- 14) The capture operation in counter mode is feasible when mode of CCP module is \_\_\_\_\_
- a) synchronized
  - b) asynchronized
  - c) synchronized as well as asynchronized
  - d) irrespective of synchronization

<b>Seat No.</b>	
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**Set****P**

**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three.** **12**
- a) Compare CISC & RISC Microcontroller
  - b) Explain the 8051 Instructions set.
  - c) Explain different Addressing Modes of 8051 Microcontroller with examples.
  - d) Explain the Memory organization & Mapping in 8051.
- Q.3 Attempt any two.** **16**
- a) Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller 8051.
  - b) Brief about Timers and Counter and its associated registers in 8051.
  - c) Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.

**Section – II**

- Q.4 Attempt any three.** **12**
- a) Explain in brief the Functional pin description of PIC16F877A
  - b) Mention the various kinds of RESET? Explain any one in detail.
  - c) Explain Configuration word in PIC 16F877A.
  - d) Explain any one Master Synchronous Serial Port (MSSP) module.
- Q.5 Attempt any two.** **16**
- a) Explain the terms in PIC 16F877A:  
i) Internal ADC      ii) The Watchdog Timer
  - b) Explain all types of Interrupts in PIC 16F877A.
  - c) Explain CCP module in PIC 16F877A in detail.

Seat No.	
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Set	Q
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?
 

a) PSW	b) SP
c) DPTR	d) PC
- 2) An alternate function of port pin P3.4 in the 8051 is:
 

a) Timer 0	b) Timer 1
c) interrupt 0	d) interrupt 1
- 3) PSEN stands for \_\_\_\_
 

a) Program Select Enable	b) Peripheral Store Enable
c) Program Store Enable	d) Peripheral Select Enable
- 4) How many rows and columns are present in a 16\*2 alphanumeric LCD?
 

a) rows=2, columns=32	b) rows=16, columns=2
c) rows=16, columns=16	d) rows=2, columns=16
- 5) For writing commands on an LCD, RS bit is
 

a) set	b) reset
c) set & reset	d) none of the mentioned
- 6) What is the purpose of a special function register SPBRG in USART?
 

a) To control the operation associated with baud rate generation
b) To control an oscillator frequency
c) To control or prevent the false bit transmission of 9 <sup>th</sup> bit
d) All of the above
- 7) The capture operation in counter mode is feasible when mode of CCP module is \_\_\_\_
 

a) synchronized
b) asynchronized
c) synchronized as well as asynchronized
d) irrespective of synchronization
- 8) The internal RAM memory of the 8051 is \_\_\_\_
 

a) 32 bytes	b) 64 bytes
c) 128 bytes	d) 256 bytes



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three.** **12**
- a) Compare CISC & RISC Microcontroller
  - b) Explain the 8051 Instructions set.
  - c) Explain different Addressing Modes of 8051 Microcontroller with examples.
  - d) Explain the Memory organization & Mapping in 8051.
- Q.3 Attempt any two.** **16**
- a) Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller 8051.
  - b) Brief about Timers and Counter and its associated registers in 8051.
  - c) Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.

**Section – II**

- Q.4 Attempt any three.** **12**
- a) Explain in brief the Functional pin description of PIC16F877A
  - b) Mention the various kinds of RESET? Explain any one in detail.
  - c) Explain Configuration word in PIC 16F877A.
  - d) Explain any one Master Synchronous Serial Port (MSSP) module.
- Q.5 Attempt any two.** **16**
- a) Explain the terms in PIC 16F877A:  
i) Internal ADC      ii) The Watchdog Timer
  - b) Explain all types of Interrupts in PIC 16F877A.
  - c) Explain CCP module in PIC 16F877A in detail.

Seat No.	
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) How many rows and columns are present in a 16\*2 alphanumeric LCD?
  - a) rows=2, columns=32
  - b) rows=16, columns=2
  - c) rows=16, columns=16
  - d) rows=2, columns=16
- 2) For writing commands on an LCD, RS bit is
  - a) set
  - b) reset
  - c) set & reset
  - d) none of the mentioned
- 3) What is the purpose of a special function register SPBRG in USART?
  - a) To control the operation associated with baud rate generation
  - b) To control an oscillator frequency
  - c) To control or prevent the false bit transmission of 9<sup>th</sup> bit
  - d) All of the above
- 4) The capture operation in counter mode is feasible when mode of CCP module is \_\_\_\_\_.
  - a) synchronized
  - b) asynchronized
  - c) synchronized as well as asynchronized
  - d) irrespective of synchronization
- 5) The internal RAM memory of the 8051 is \_\_\_\_\_.
  - a) 32 bytes
  - b) 64 bytes
  - c) 128 bytes
  - d) 256 bytes
- 6) The 8051 has \_\_\_\_\_ 16-bit counter/timers.
  - a) 2
  - b) 1
  - c) 4
  - d) 3
- 7) Data transfer from I/O to external data memory can only be done with the MOVX command.
  - a) True
  - b) False
- 8) In UART, \_\_\_\_\_ register is used as Transmit Status and Control Register
  - a) RCSTA
  - b) TXREG
  - c) TXSTA
  - d) RCREG



Seat No.	
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Set	R
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three.** **12**
- Compare CISC & RISC Microcontroller
  - Explain the 8051 Instructions set.
  - Explain different Addressing Modes of 8051 Microcontroller with examples.
  - Explain the Memory organization & Mapping in 8051.
- Q.3 Attempt any two.** **16**
- Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller 8051.
  - Brief about Timers and Counter and its associated registers in 8051.
  - Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.

**Section – II**

- Q.4 Attempt any three.** **12**
- Explain in brief the Functional pin description of PIC16F877A
  - Mention the various kinds of RESET? Explain any one in detail.
  - Explain Configuration word in PIC 16F877A.
  - Explain any one Master Synchronous Serial Port (MSSP) module.
- Q.5 Attempt any two.** **16**
- Explain the terms in PIC 16F877A:
    - Internal ADC
    - The Watchdog Timer
  - Explain all types of Interrupts in PIC 16F877A.
  - Explain CCP module in PIC 16F877A in detail.



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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXX on the basis of instructions execution?
  - a) Carry Flag
  - b) Zero Flag
  - c) Digit Carry Flag
  - d) All of the above
- 2) Address assigned to INT1 & Timer 1 interrupts are \_\_\_\_\_.
  - a) 0013H & 001BH
  - b) 001BH & 0013H
  - c) 0003H & 000BH
  - d) 0013H & 0023H
- 3) When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?
  - a) PSW
  - b) SP
  - c) DPTR
  - d) PC
- 4) An alternate function of port pin P3.4 in the 8051 is:
  - a) Timer 0
  - b) Timer 1
  - c) interrupt 0
  - d) interrupt 1
- 5) PSEN stands for \_\_\_\_\_.
  - a) Program Select Enable
  - b) Peripheral Store Enable
  - c) Program Store Enable
  - d) Peripheral Select Enable
- 6) How many rows and columns are present in a 16\*2 alphanumeric LCD?
  - a) rows=2, columns=32
  - b) rows=16, columns=2
  - c) rows=16, columns=16
  - d) rows=2, columns=16
- 7) For writing commands on an LCD, RS bit is
  - a) set
  - b) reset
  - c) set & reset
  - d) none of the mentioned
- 8) What is the purpose of a special function register SPBRG in USART?
  - a) To control the operation associated with baud rate generation
  - b) To control an oscillator frequency
  - c) To control or prevent the false bit transmission of 9<sup>th</sup> bit
  - d) All of the above

- 9) The capture operation in counter mode is feasible when mode of CCP module is \_\_\_\_\_  
a) synchronized  
b) asynchronized  
c) synchronized as well as asynchronized  
d) irrespective of synchronization
- 10) The internal RAM memory of the 8051 is \_\_\_\_\_  
a) 32 bytes  
b) 64 bytes  
c) 128 bytes  
d) 256 bytes
- 11) The 8051 has \_\_\_\_\_ 16-bit counter/timers.  
a) 2  
b) 1  
c) 4  
d) 3
- 12) Data transfer from I/O to external data memory can only be done with the MOVX command.  
a) True  
b) False
- 13) In UART, \_\_\_\_\_ register is used as Transmit Status and Control Register  
a) RCSTA  
b) TXREG  
c) TXSTA  
d) RCREG
- 14) In PIC16F877A, \_\_\_\_\_ bit resolution ADC is available.  
a) 10  
b) 8  
c) 4  
d) 1

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microcontrollers and Applications**

Day & Date: Tuesday, 07-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) Compare CISC & RISC Microcontroller
- b) Explain the 8051 Instructions set.
- c) Explain different Addressing Modes of 8051 Microcontroller with examples.
- d) Explain the Memory organization & Mapping in 8051.

**Q.3 Attempt any two.** **16**

- a) Discuss interfacing of external 16K EPROM and 8K RAM with the microcontroller 8051.
- b) Brief about Timers and Counter and its associated registers in 8051.
- c) Explain interfacing of stepper motor with microcontroller. Write program to rotate stepper motor in clockwise direction continuously in full step mode.

**Section – II**

**Q.4 Attempt any three.** **12**

- a) Explain in brief the Functional pin description of PIC16F877A
- b) Mention the various kinds of RESET? Explain any one in detail.
- c) Explain Configuration word in PIC 16F877A.
- d) Explain any one Master Synchronous Serial Port (MSSP) module.

**Q.5 Attempt any two.** **16**

- a) Explain the terms in PIC 16F877A:
  - i) Internal ADC
  - ii) The Watchdog Timer
- b) Explain all types of Interrupts in PIC 16F877A.
- c) Explain CCP module in PIC 16F877A in detail.

Seat No.	
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Set

P

**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ theory can be described as a code of conduct to which all rational beings should adhere. This contrasts with \_\_\_\_\_ morality which is the code of conduct adopted by a particular group or society.
  - a) Descriptive, Normative
  - b) Normative, Instrumental
  - c) Normative, Descriptive
  - d) Ethical, Descriptive
- 2) \_\_\_\_\_ and \_\_\_\_\_ are both examples of \_\_\_\_\_ based theories which are based on basic universal principles of right and wrong.
  - a) Ethics of duty, Ethics of rights and justice, Principle
  - b) Utilitarianism, Egoism, Principle
  - c) Ethics of duty, Utilitarianism, Consequentialist
  - d) Egoism, Ethics of rights and justice, Consequentialist incorrect
- 3) What term can be used to describe 'the hypothetical agreement between member of society and those who govern it which establishes the inter-relationships, rights and responsibilities on a fair basis'?
  - a) Social Contract
  - b) Duty Ethics
  - c) Consequentialism
  - d) Virtue Ethics
- 4) What type of justice exist if employees are being open, honest and truthful in their communications at work?
  - a) Procedural
  - b) Distributive
  - c) Ethical
  - d) Interactional
- 5) Stakeholders are considered more important to an organization when :
  - a) They can make use of their power on the organization
  - b) They do not emphasize the urgency of their issues
  - c) Their issues are not legitimate
  - d) They can express themselves articulately
- 6) \_\_\_\_\_ is a problem, situation or opportunity requiring an individual, group, or organization to choose among several actions that must be evaluated as right or wrong.
  - a) Crisis
  - b) Ethical Issue
  - c) Fraud
  - d) Indictment

- 7) A stakeholder orientation includes all of the following activities except:
- a) generating data about stakeholder group
  - b) assessing the firms effect on stakeholder groups
  - c) distributing stakeholder information throughout the firm
  - d) minimizing the influence of stakeholder information on the firm
- 8) Ethics should guide the technology towards \_\_\_\_.
- a) Political justice
  - b) Cultural justice
  - c) Social justice
  - d) None of the Above
- 9) A company whose shares are easily transferred is \_\_\_\_.
- a) Private Company
  - b) Public Company
  - c) Both (a). & (b).
  - d) None of the above
- 10) Codes of conduct and codes of ethics \_\_\_\_.
- a) are formal statements that describe what an organization expects of its employees
  - b) become necessary only after a company has been in legal trouble
  - c) are designed for top executives and managers, not regular employees
  - d) rarely become an effective component of the ethics and compliance program
- 11) The first step in the auditing process should be to secure the commitment of:
- a) employees.
  - b) top executives and directors.
  - c) stockholders
  - d) customers
- 12) An organization's obligation to act to protect and improve society's welfare as well as its own interests is referred to as
- a) organizational social responsibility
  - b) organizational social responsiveness
  - c) corporate obligation
  - d) business ethics
- 13) Managerial ethics can be characterized by all of the following levels except
- a) Immoral management
  - b) Amoral management
  - c) Demoral management
  - d) Moral management
- 14) \_\_\_\_\_ are the principles, which govern and guide business people to perform business functions
- a) business ethics
  - b) code of conduct
  - c) all of these
  - d) None

Seat No.	
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Set

P

**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.  
 4) Draw neat diagram wherever necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- 1) Explain problems with stakeholder collaboration.
  - 2) Explain Social Accounting.
  - 3) Explain ethical impacts of globalization.
  - 4) Explain Corporate Social Responsibility.
  - 5) What is Corporation?
- Q.3 Attempt any two. 12**
- 1) What are normative ethical theories?
  - 2) Explain in detail the three components of sustainability'.
  - 3) Explain in detail an instrumental perspective.

**Section – II**

- Q.4 Answer any four questions. 16**
- 1) Explain Optimum level of pollution removal.
  - 2) Explain issues around marketing in a global marketplace.
  - 3) What is sustainable consumption?
  - 4) Explain Ethical issues in the relation between business and government.
  - 5) Explain modes of business influence on government.
- Q.5 Answer any two questions. 12**
- 1) Explain necessary conditions for a conflict of interest to arise.
  - 2) Explain political view of the organization similarity argument.
  - 3) Explain Diversity in CSO Characteristics.

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Ethics should guide the technology towards \_\_\_\_\_.  
 a) Political justice                      b) Cultural justice  
 c) Social justice                         d) None of the Above
- 2) A company whose shares are easily transferred is \_\_\_\_\_.  
 a) Private Company                      b) Public Company  
 c) Both (a). & (b).                         d) None of the above
- 3) Codes of conduct and codes of ethics \_\_\_\_\_.  
 a) are formal statements that describe what an organization expects of its employees  
 b) become necessary only after a company has been in legal trouble  
 c) are designed for top executives and managers, not regular employees  
 d) rarely become an effective component of the ethics and compliance program
- 4) The first step in the auditing process should be to secure the commitment of:  
 a) employees.                                b) top executives and directors.  
 c) stockholders                               d) customers
- 5) An organization's obligation to act to protect and improve society's welfare as well as its own interests is referred to as  
 a) organizational social responsibility  
 b) organizational social responsiveness  
 c) corporate obligation  
 d) business ethics
- 6) Managerial ethics can be characterized by all of the following levels except  
 a) Immoral management                      b) Amoral management  
 c) Demoral management                      d) Moral management
- 7) \_\_\_\_\_ are the principles, which govern and guide business people to perform business functions  
 a) business ethics                              b) code of conduct  
 c) all of these                                    d) None

- 8) \_\_\_\_\_ theory can be described as a code of conduct to which all rational beings should adhere. This contrasts with \_\_\_\_\_ morality which is the code of conduct adopted by a particular group or society.
- a) Descriptive, Normative                      b) Normative, Instrumental
  - c) Normative, Descriptive                      d) Ethical, Descriptive
- 9) \_\_\_\_\_ and \_\_\_\_\_ are both examples of \_\_\_\_\_ based theories which are based on basic universal principles of right and wrong.
- a) Ethics of duty, Ethics of rights and justice, Principle
  - b) Utilitarianism, Egoism, Principle
  - c) Ethics of duty, Utilitarianism, Consequentialist
  - d) Egoism, Ethics of rights and justice, Consequentialist incorrect
- 10) What term can be used to describe 'the hypothetical agreement between member of society and those who govern it which establishes the inter-relationships, rights and responsibilities on a fair basis'?
- a) Social Contract                                      b) Duty Ethics
  - c) Consequentialism                                      d) Virtue Ethics
- 11) What type of justice exist if employees are being open, honest and truthful in their communications at work?
- a) Procedural    b) Distributive
  - c) Ethical    d) Interactional
- 12) Stakeholders are considered more important to an organization when :
- a) They can make use of their power on the organization
  - b) They do not emphasize the urgency of their issues
  - c) Their issues are not legitimate
  - d) They can express themselves articulately
- 13) \_\_\_\_\_ is a problem, situation or opportunity requiring an individual, group, or organization to choose among several actions that must be evaluated as right or wrong.
- a) Crisis    b) Ethical Issue
  - c) Fraud    d) Indictment
- 14) A stakeholder orientation includes all of the following activities except:
- a) generating data about stakeholder group
  - b) assessing the firms effect on stakeholder groups
  - c) distributing stakeholder information throughout the firm
  - d) minimizing the influence of stakeholder information on the firm



<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:**
- 1) All questions are compulsory.
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  - 3) Assume suitable data if necessary.
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**Section – I**

- Q.2 Attempt any four. 16**
- 1) Explain problems with stakeholder collaboration.
  - 2) Explain Social Accounting.
  - 3) Explain ethical impacts of globalization.
  - 4) Explain Corporate Social Responsibility.
  - 5) What is Corporation?
- Q.3 Attempt any two. 12**
- 1) What are normative ethical theories?
  - 2) Explain in detail the three components of sustainability'.
  - 3) Explain in detail an instrumental perspective.

**Section – II**

- Q.4 Answer any four questions. 16**
- 1) Explain Optimum level of pollution removal.
  - 2) Explain issues around marketing in a global marketplace.
  - 3) What is sustainable consumption?
  - 4) Explain Ethical issues in the relation between business and government.
  - 5) Explain modes of business influence on government.
- Q.5 Answer any two questions. 12**
- 1) Explain necessary conditions for a conflict of interest to arise.
  - 2) Explain political view of the organization similarity argument.
  - 3) Explain Diversity in CSO Characteristics.

Seat No.	
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Set R
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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The first step in the auditing process should be to secure the commitment of:
  - a) employees.
  - b) top executives and directors.
  - c) stockholders
  - d) customers
- 2) An organization's obligation to act to protect and improve society's welfare as well as its own interests is referred to as
  - a) organizational social responsibility
  - b) organizational social responsiveness
  - c) corporate obligation
  - d) business ethics
- 3) Managerial ethics can be characterized by all of the following levels except
  - a) Immoral management
  - b) Amoral management
  - c) Demoral management
  - d) Moral management
- 4) \_\_\_\_\_ are the principles, which govern and guide business people to perform business functions
  - a) business ethics
  - b) code of conduct
  - c) all of these
  - d) None
- 5) \_\_\_\_\_ theory can be described as a code of conduct to which all rational beings should adhere. This contrasts with \_\_\_\_\_ morality which is the code of conduct adopted by a particular group or society.
  - a) Descriptive, Normative
  - b) Normative, Instrumental
  - c) Normative, Descriptive
  - d) Ethical, Descriptive
- 6) \_\_\_\_\_ and \_\_\_\_\_ are both examples of \_\_\_\_\_ based theories which are based on basic universal principles of right and wrong.
  - a) Ethics of duty, Ethics of rights and justice, Principle
  - b) Utilitarianism, Egoism, Principle
  - c) Ethics of duty, Utilitarianism, Consequentialist
  - d) Egoism, Ethics of rights and justice, Consequentialist incorrect

- 7) What term can be used to describe 'the hypothetical agreement between member of society and those who govern it which establishes the inter-relationships, rights and responsibilities on a fair basis'?
- a) Social Contract
  - b) Duty Ethics
  - c) Consequentialism
  - d) Virtue Ethics
- 8) What type of justice exist if employees are being open, honest and truthful in their communications at work?
- a) Procedural
  - b) Distributive
  - c) Ethical
  - d) Interactional
- 9) Stakeholders are considered more important to an organization when :
- a) They can make use of their power on the organization
  - b) They do not emphasize the urgency of their issues
  - c) Their issues are not legitimate
  - d) They can express themselves articulately
- 10) \_\_\_\_\_ is a problem, situation or opportunity requiring an individual, group, or organization to choose among several actions that must be evaluated as right or wrong.
- a) Crisis
  - b) Ethical Issue
  - c) Fraud
  - d) Indictment
- 11) A stakeholder orientation includes all of the following activities except:
- a) generating data about stakeholder group
  - b) assessing the firms effect on stakeholder groups
  - c) distributing stakeholder information throughout the firm
  - d) minimizing the influence of stakeholder information on the firm
- 12) Ethics should guide the technology towards \_\_\_\_\_.
- a) Political justice
  - b) Cultural justice
  - c) Social justice
  - d) None of the Above
- 13) A company whose shares are easily transferred is \_\_\_\_\_.
- a) Private Company
  - b) Public Company
  - c) Both (a). & (b).
  - d) None of the above
- 14) Codes of conduct and codes of ethics \_\_\_\_\_.
- a) are formal statements that describe what an organization expects of its employees
  - b) become necessary only after a company has been in legal trouble
  - c) are designed for top executives and managers, not regular employees
  - d) rarely become an effective component of the ethics and compliance program

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.  
4) Draw neat diagram wherever necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- 1) Explain problems with stakeholder collaboration.
  - 2) Explain Social Accounting.
  - 3) Explain ethical impacts of globalization.
  - 4) Explain Corporate Social Responsibility.
  - 5) What is Corporation?
- Q.3 Attempt any two. 12**
- 1) What are normative ethical theories?
  - 2) Explain in detail the three components of sustainability'.
  - 3) Explain in detail an instrumental perspective.

**Section – II**

- Q.4 Answer any four questions. 16**
- 1) Explain Optimum level of pollution removal.
  - 2) Explain issues around marketing in a global marketplace.
  - 3) What is sustainable consumption?
  - 4) Explain Ethical issues in the relation between business and government.
  - 5) Explain modes of business influence on government.
- Q.5 Answer any two questions. 12**
- 1) Explain necessary conditions for a conflict of interest to arise.
  - 2) Explain political view of the organization similarity argument.
  - 3) Explain Diversity in CSO Characteristics.

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is a problem, situation or opportunity requiring an individual, group, or organization to choose among several actions that must be evaluated as right or wrong.
 

a) Crisis	b) Ethical Issue
c) Fraud	d) Indictment
- 2) A stakeholder orientation includes all of the following activities except:
 

a) generating data about stakeholder group
b) assessing the firms effect on stakeholder groups
c) distributing stakeholder information throughout the firm
d) minimizing the influence of stakeholder information on the firm
- 3) Ethics should guide the technology towards \_\_\_\_\_.
 

a) Political justice	b) Cultural justice
c) Social justice	d) None of the Above
- 4) A company whose shares are easily transferred is \_\_\_\_\_.
 

a) Private Company	b) Public Company
c) Both (a). & (b).	d) None of the above
- 5) Codes of conduct and codes of ethics \_\_\_\_\_.
 

a) are formal statements that describe what an organization expects of its employees
b) become necessary only after a company has been in legal trouble
c) are designed for top executives and managers, not regular employees
d) rarely become an effective component of the ethics and compliance program
- 6) The first step in the auditing process should be to secure the commitment of:
 

a) employees.	b) top executives and directors.
c) stockholders	d) customers

- 7) An organization's obligation to act to protect and improve society's welfare as well as its own interests is referred to as
- a) organizational social responsibility
  - b) organizational social responsiveness
  - c) corporate obligation
  - d) business ethics
- 8) Managerial ethics can be characterized by all of the following levels except
- a) Immoral management
  - b) Amoral management
  - c) Demoral management
  - d) Moral management
- 9) \_\_\_\_\_ are the principles, which govern and guide business people to perform business functions
- a) business ethics
  - b) code of conduct
  - c) all of these
  - d) None
- 10) \_\_\_\_\_ theory can be described as a code of conduct to which all rational beings should adhere. This contrasts with \_\_\_\_\_ morality which is the code of conduct adopted by a particular group or society.
- a) Descriptive, Normative
  - b) Normative, Instrumental
  - c) Normative, Descriptive
  - d) Ethical, Descriptive
- 11) \_\_\_\_\_ and \_\_\_\_\_ are both examples of \_\_\_\_\_ based theories which are based on basic universal principles of right and wrong.
- a) Ethics of duty, Ethics of rights and justice, Principle
  - b) Utilitarianism, Egoism, Principle
  - c) Ethics of duty, Utilitarianism, Consequentialist
  - d) Egoism, Ethics of rights and justice, Consequentialist incorrect
- 12) What term can be used to describe 'the hypothetical agreement between member of society and those who govern it which establishes the inter-relationships, rights and responsibilities on a fair basis'?
- a) Social Contract
  - b) Duty Ethics
  - c) Consequentialism
  - d) Virtue Ethics
- 13) What type of justice exist if employees are being open, honest and truthful in their communications at work?
- a) Procedural
  - b) Distributive
  - c) Ethical
  - d) Interactional
- 14) Stakeholders are considered more important to an organization when :
- a) They can make use of their power on the organization
  - b) They do not emphasize the urgency of their issues
  - c) Their issues are not legitimate
  - d) They can express themselves articulately

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.  
4) Draw neat diagram wherever necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- 1) Explain problems with stakeholder collaboration.
  - 2) Explain Social Accounting.
  - 3) Explain ethical impacts of globalization.
  - 4) Explain Corporate Social Responsibility.
  - 5) What is Corporation?
- Q.3 Attempt any two. 12**
- 1) What are normative ethical theories?
  - 2) Explain in detail the three components of sustainability'.
  - 3) Explain in detail an instrumental perspective.

**Section – II**

- Q.4 Answer any four questions. 16**
- 1) Explain Optimum level of pollution removal.
  - 2) Explain issues around marketing in a global marketplace.
  - 3) What is sustainable consumption?
  - 4) Explain Ethical issues in the relation between business and government.
  - 5) Explain modes of business influence on government.
- Q.5 Answer any two questions. 12**
- 1) Explain necessary conditions for a conflict of interest to arise.
  - 2) Explain political view of the organization similarity argument.
  - 3) Explain Diversity in CSO Characteristics.

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P

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the following is considered production Economics?
  - a) Tilling of Soil
  - b) Singing a song before friends
  - c) Preventing a child from falling into a manhole on the road
  - d) Painting a picture for pleasure
- 2) Identify the Correct statement:
  - a) The Average Product is at its maximum when marginal product is equal to Average Product
  - b) The Law of Increasing returns to scale relates to the effect of changes in factor proportions.
  - c) Economies of scale arise only because of indivisibilities of factor proportions.
  - d) Internal economies of scale can accrue when industry expands beyond optimum.
- 3) Which of the following is not a characteristic of land?
  - a) Its supply for the economy is limited.
  - b) It's a immobile
  - c) Its usefulness depends on human efforts
  - d) It is produced by our forefathers.
- 4) Which of the following statement is true?
  - a) Accumulation of capital depends solely on income of individuals
  - b) Saving can be influenced by government policies
  - c) External economies go with size and internal economies with location
  - d) The supply curve of labour is an upward slopping curve
- 5) Macroeconomics is also called \_\_\_\_\_ Economics.
  - a) Applied
  - b) Aggregate
  - c) Experimental
  - d) None of the above
- 6) In Economics we use the term scarcity to mean
  - a) Abstract scarcity ad lack of resource in less developed countries
  - b) Relative scarcity i.e scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
  - d) Scarcity caused on account of excessive consumption by the rich



- 7) Business economics is
- a) Abstract and applies the tools of Microeconomics
  - b) Involves practice application of economic theory in business decision making
  - c) Incorporates tools from multiple disciplines.
  - d) (b) and (c) above
- 8) What implication (s) does resource scarcity have for the satisfaction of wants?
- a) Not all wants can be satisfied.
  - b) We will never be faced with the need to make a choice
  - c) We must develop ways to decrease our individual wants
  - d) The discovery of new natural resource is necessary to increase our ability to satisfy wants.
- 9) Which of the following is a normative statement
- a) Planned economies allocate resources via government development
  - b) Most transitional economies have experienced problems of falling output and rising prices over the past decade
  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
  - d) Reducing inequality should be a major priority for mixed economies
- 10) Demand for a commodity refers to :
- a) Desire backed by ability to pay for the commodity
  - b) Need for the commodity and willingness to pay for it
  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time
- 11) Contraction of demand is a result of:
- a) Decrease in the number of consumers
  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers
- 12) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
- a) The preference of the individual
  - b) His monetary income
  - c) Price of the commodity
  - d) Price of related goods.
- 13) Which of the following pairs of goods is an example of substitutes?
- a) Tea and sugar
  - b) Tea and coffee
  - c) Pen and ink
  - d) Shirts and trousers
- 14) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
- a) 0
  - b) 1
  - c) 1.5
  - d) 2

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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**SECTION – 1**

**Q.2 Attempt any Four.****16**

- Define Managerial Economics and Discuss its Scope, What is the importance of Managerial Economics.
- What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
- Define and Distinguish between Income Elasticity and price Elasticity.
- What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions.
- What is meant by Utility? Distinguish Between Cardinal and Ordinal Concept of Utility.
- What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and illustrate Graphically.

**Q.3 Attempt any Two.****12**

- What are major Macro-economics Issues Related Directly to business decision making? What is their significance in Business decisions?
- What is meant by Utility? What are the conditions for Application of Law of Diminishing Utility?
- What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?

**SECTION – II**

**Q.4 Attempt any Four.****16**

- What is purpose of demand forecasting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- What are the methods used for Forecasting demand? Discuss in detail the survey method of forecasting demand for consumer goods. What are the advantages and Limitations?
- Define and Distinguish between Arc Elasticity and Point Elasticity.
- What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- What is meant by production? Distinguish between Fixed and Variable Inputs.
- What is Opportunity Cost? Give some Examples of Opportunity Cost.

**Q.5 Attempt any Two.**

- a)** Explain following Cost Concepts with examples.
  - i) Variable Cost
  - ii) Fixed Cost
  - iii) Explicit Cost
  - iv) Implicit Cost
- b)** Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c)** Explain the Law of supply through a supply schedule and a supply curve. Why does a supply curve slop upward to the right? What factors cause a rightward shift in the supply curve?

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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) What implication (s) does resource scarcity have for the satisfaction of wants?
  - a) Not all wants can be satisfied.
  - b) We will never be faced with the need to make a choice
  - c) We must develop ways to decrease our individual wants
  - d) The discovery of new natural resource is necessary to increase our ability to satisfy wants.
- 2) Which of the following is a normative statement
  - a) Planned economies allocate resources via government development
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  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
  - d) Reducing inequality should be a major priority for mixed economies
- 3) Demand for a commodity refers to :
  - a) Desire backed by ability to pay for the commodity
  - b) Need for the commodity and willingness to pay for it
  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time
- 4) Contraction of demand is a result of:
  - a) Decrease in the number of consumers
  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers
- 5) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
  - a) The preference of the individual
  - b) His monetary income
  - c) Price of the commodity
  - d) Price of related goods.

- 5) Which of the following pairs of goods is an example of substitutes?
  - a) Tea and sugar
  - b) Tea and coffee
  - c) Pen and ink
  - d) Shirts and trousers
- 7) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
  - a) 0
  - b) 1
  - c) 1.5
  - d) 2
- 8) Which of the following is considered production Economics?
  - a) Tilling of Soil
  - b) Singing a song before friends
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  - c) Its usefulness depends on human efforts
  - d) It is produced by our forefathers.
- 11) Which of the following statement is true?
  - a) Accumulation of capital depends solely on income of individuals
  - b) Saving can be influenced by government policies
  - c) External economies go with size and internal economies with location
  - d) The supply curve of labour is an upward sloping curve
- 12) Macroeconomics is also called \_\_\_\_\_ Economics.
  - a) Applied
  - b) Aggregate
  - c) Experimental
  - d) None of the above
- 13) In Economics we use the term scarcity to mean
  - a) Abstract scarcity and lack of resource in less developed countries
  - b) Relative scarcity i.e scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
  - d) Scarcity caused on account of excessive consumption by the rich
- 14) Business economics is
  - a) Abstract and applies the tools of Microeconomics
  - b) Involves practical application of economic theory in business decision making
  - c) Incorporates tools from multiple disciplines.
  - d) (b) and (c) above

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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
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**SECTION – 1**

**Q.2 Attempt any Four.** **16**

- a) Define Managerial Economics and Discuss its Scope, What is the importance of Managerial Economics.
- b) What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
- c) Define and Distinguish between Income Elasticity and price Elasticity.
- d) What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions.
- e) What is meant by Utility? Distinguish Between Cardinal and Ordinal Concept of Utility.
- f) What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and illustrate Graphically.

**Q.3 Attempt any Two.** **12**

- a) What are major Macro-economics Issues Related Directly to business decision making? What is their significance in Business decisions?
- b) What is meant by Utility? What are the conditions for Application of Law of Diminishing Utility?
- c) What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?

**SECTION – II**

**Q.4 Attempt any Four.** **16**

- a) What is purpose of demand forecasting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- b) What are the methods used for Forecasting demand? Discuss in detail the survey method of forecasting demand for consumer goods. What are the advantages and Limitations?
- c) Define and Distinguish between Arc Elasticity and Point Elasticity.
- d) What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- e) What is meant by production? Distinguish between Fixed and Variable Inputs.
- f) What is Opportunity Cost? Give some Examples of Opportunity Cost.

**Q.5 Attempt any Two.**

- a)** Explain following Cost Concepts with examples.
  - i) Variable Cost
  - ii) Fixed Cost
  - iii) Explicit Cost
  - iv) Implicit Cost
- b)** Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c)** Explain the Law of supply through a supply schedule and a supply curve. Why does a supply curve slop upward to the right? What factors cause a rightward shift in the supply curve?

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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

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  - a) The preference of the individual
  - b) His monetary income
  - c) Price of the commodity
  - d) Price of related goods.
- 3) Which of the following pairs of goods is an example of substitutes?
 

a) Tea and sugar	b) Tea and coffee
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- 4) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
 

a) 0	b) 1
c) 1.5	d) 2
- 5) Which of the following is considered production Economics?
  - a) Tilling of Soil
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- 7) Which of the following is not a characteristic of land?
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  - d) Reducing in inequality should be major priority for mixed economies
- 14) Demand for a commodity refers to :
- a) Desire backed by ability to pay for the commodity
  - b) Need for the commodity and willingness to pay for it
  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time

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**Set****R**

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**SECTION – 1****Q.2 Attempt any Four.****16**

- Define Managerial Economics and Discuss its Scope, What is the importance of Managerial Economics.
- What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
- Define and Distinguish between Income Elasticity and price Elasticity.
- What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions.
- What is meant by Utility? Distinguish Between Cardinal and Ordinal Concept of Utility.
- What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and illustrate Graphically.

**Q.3 Attempt any Two.****12**

- What are major Macro-economics Issues Related Directly to business decision making? What is their significance in Business decisions?
- What is meant by Utility? What are the conditions for Application of Law of Diminishing Utility?
- What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?

**SECTION – II****Q.4 Attempt any Four.****16**

- What is purpose of demand forecasting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- What are the methods used for Forecasting demand? Discuss in detail the survey method of forecasting demand for consumer goods. What are the advantages and Limitations?
- Define and Distinguish between Arc Elasticity and Point Elasticity.
- What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- What is meant by production? Distinguish between Fixed and Variable Inputs.
- What is Opportunity Cost? Give some Examples of Opportunity Cost.

**Q.5 Attempt any Two.**

- a)** Explain following Cost Concepts with examples.
  - i) Variable Cost
  - ii) Fixed Cost
  - iii) Explicit Cost
  - iv) Implicit Cost
- b)** Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c)** Explain the Law of supply through a supply schedule and a supply curve. Why does a supply curve slop upward to the right? What factors cause a rightward shift in the supply curve?

Seat No.	
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Set **S**

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) In Economics we use the term scarcity to mean
  - a) Abstract scarcity and lack of resource in less developed countries
  - b) Relative scarcity i.e scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
  - d) Scarcity caused on account of excessive consumption by the rich
- 2) Business economics is
  - a) Abstract and applies the tools of Microeconomics
  - b) Involves practice application of economic theory in business decision making
  - c) Incorporates tools from multiple disciplines.
  - d) (b) and (c) above
- 3) What implication (s) does resource scarcity have for the satisfaction of wants?
  - a) Not all wants can be satisfied.
  - b) We will never be faced with the need to make a choice
  - c) We must develop ways to decrease our individual wants
  - d) The discovery of new natural resource is necessary to increase our ability to satisfy wants.
- 4) Which of the following is a normative statement
  - a) Planned economies allocate resources via government development
  - b) Most transitional economies have experienced problems of falling output and rising prices over the past decade
  - c) There is a greater degree of consumer sovereignty in market economies than planned economies
  - d) Reducing inequality should be a major priority for mixed economies
- 5) Demand for a commodity refers to :
  - a) Desire backed by ability to pay for the commodity
  - b) Need for the commodity and willingness to pay for it
  - c) The quantity demanded of that commodity at a certain price
  - d) The quantity of the commodity demanded at a certain price during any particular period of time

- 6) Contraction of demand is result of:
  - a) Decrease in the number of consumers
  - b) Increase in the price of the good concerned
  - c) Increase in the price of other goods
  - d) Decrease in the income of purchasers
- 7) All but one of the following are assumed to remain the same while drawing an individual's demand curve for a commodity. Which one is it?
  - a) The preference of the individual
  - b) His monetary income
  - c) Price of the commodity
  - d) Price of related goods.
- 8) Which of the following pairs of goods is an example of substitutes?
 

a) Tea and sugar	b) Tea and coffee
c) Pen and ink	d) Shirts trousers
- 9) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
 

a) 0	b) 1
c) 1.5	d) 2
- 10) Which of the following is considered production Economics?
  - a) Tilling of Soil
  - b) Singing a song before friends
  - c) Preventing a child from falling into a manhole on the road
  - d) Painting a picture for pleasure
- 11) Identify the Correct statement:
  - a) The Average Product is at its maximum when marginal product is equal to Average Product
  - b) The Law of Increasing returns to scale relates to the effect of changes in factor proportions.
  - c) Economies of scale arise only because of indivisibilities of factor proportions.
  - d) Internal economies of scale can accrue when industry expands beyond optimum.
- 12) Which of the following is not a characteristic of land?
  - a) Its supply for the economy is limited.
  - b) It's a immobile
  - c) Its usefulness depends on human efforts
  - d) It is produced by our forefathers.
- 13) Which of the following statement is true?
  - a) Accumulation of capital depends solely on income of individuals
  - b) Saving can be influenced by government policies
  - c) External economies go with size and internal economies with location
  - d) The supply curve of labour is an upward slopping curve
- 14) Macroeconomics is also called \_\_\_\_\_ Economics.
 

a) Applied	b) Aggregate
c) Experimental	d) None of the above

Seat No.	
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Set

S

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Managerial Economics**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**SECTION – 1**

**Q.2 Attempt any Four.****16**

- Define Managerial Economics and Discuss its Scope, What is the importance of Managerial Economics.
- What is law of Equimarginal Utility? What is the Condition for Equi-Marginal Utility?
- Define and Distinguish between Income Elasticity and price Elasticity.
- What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions.
- What is meant by Utility? Distinguish Between Cardinal and Ordinal Concept of Utility.
- What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and illustrate Graphically.

**Q.3 Attempt any Two.****12**

- What are major Macro-economics Issues Related Directly to business decision making? What is their significance in Business decisions?
- What is meant by Utility? What are the conditions for Application of Law of Diminishing Utility?
- What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?

**SECTION – II**

**Q.4 Attempt any Four.****16**

- What is purpose of demand forecasting? What are the necessary steps that need to be taken for Forecasting demand for a Product?
- What are the methods used for Forecasting demand? Discuss in detail the survey method of forecasting demand for consumer goods. What are the advantages and Limitations?
- Define and Distinguish between Arc Elasticity and Point Elasticity.
- What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- What is meant by production? Distinguish between Fixed and Variable Inputs.
- What is Opportunity Cost? Give some Examples of Opportunity Cost.

**Q.5 Attempt any Two.**

- a)** Explain following Cost Concepts with examples.
  - i) Variable Cost
  - ii) Fixed Cost
  - iii) Explicit Cost
  - iv) Implicit Cost
- b)** Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- c)** Explain the Law of supply through a supply schedule and a supply curve. Why does a supply curve slop upward to the right? What factors cause a rightward shift in the supply curve?

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above



- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
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  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.
- a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 10) Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**



Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
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  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-268**

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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Set	P
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850

- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks:10

10

- Page 7 of 12

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022  
ELECTRONICS & TELECOMMUNICATION ENGINEERING  
Intellectual Property Rights for Technology Development and  
Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement



<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
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  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks:10

**10**

- 1) What is the percentage of potable water on the earth?

a) 2%	b) 3%
c) 5%	d) 7%
- 2) Which of the following is the reformist movement?

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 3) Who is the father of Indology?

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 4) What is culture?

a) literature	b) way of life
c) food rituals	d) fashions
- 5) What is social norm?

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- 10) Which is distinctive nature of family?

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 2) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 3) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 5) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
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a) Small family	b) Large family
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- 7) What is the percentage of potable water on the earth?
 

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a) Chipko movement	b) Non-cooperation movement
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c) Ghurye	d) Aristotle
- 10) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

\_\_\_\_\_

## Max. Marks: 50

Marks: 10

## 10

- Page 1 of 12



- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

\_\_\_\_\_

## Max. Marks: 50

Marks: 10

10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_.
- a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |



Seat No.	
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Set	S
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks:10

10

- Page 1 of 12

- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

- Page 5 of 12



<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Max. Marks: 50

### MCQ/Objective Type Questions

Marks:10

10

- 1) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 2) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 4) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 5) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
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- 6) The objectives of professional ethics in engineering are
  - a) To understand the moral values that ought to guide the Engineering profession
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  - d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

- 9)** Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture                      b) Value  
c) Society                     d) Moral
- 10)** Virtues are \_\_\_\_\_.  
a) Moral                        b) Ethics  
c) Values                      d) Positive and preferred values

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

**Seat  
No.**

Set	P
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Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- Page 1 of 12



- 8) Which of the following antennas is used as feed antenna at microwave frequencies?
- a) Single dipole
  - b) Folded dipole
  - c) Rhombic
  - d) Horn
- 9) Waveguide fed slots give radiation \_\_\_\_\_.  
a) Single side                      b) Both sides equally  
c) Both sides unequally          d) None
- 10) Slot and dipole impedances are related by the equation \_\_\_\_\_.  
a)  $Z_s Z_d = Z_0^2$                       b)  $Z_s Z_d = Z_0^2/4$   
c)  $Z_s Z_d = Z_0^2/2$                       d) None of these
- 11) Radiation pattern denoting angle of E in different directions is \_\_\_\_\_.  
a) Amplitude pattern              b) Phase pattern  
c) Magnitude pattern              d) Polarization pattern
- 12) If three identical antennas are available, the gain is measured using \_\_\_\_\_.  
a) Two antenna method              b) Three antenna method  
c) Gain transfer method              d) None
- 13) Space wave propagation occurs at frequencies \_\_\_\_\_.  
a) Below HF                              b) In HF  
c) Above HF                              d) None
- 14) In ground wave propagation, the antennas must be located \_\_\_\_\_.  
a) Near the earth's surface              b) At a height from earth's surface  
c) Either a or b                              d) None

Seat No.	
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Set

P

**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Antenna & Wave Propagation**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following question. 12**

- Explain various antenna field zones and their boundaries with neat sketches.
- Calculate the directivity of 20 turns helix, having  $\alpha = 12^\circ$  and circumference equal to one wavelength.
- What is the need for antenna array? Explain with the types.
- Explain Babinet's principle with its features.

**Q.3 Attempt any two of the following question. 16**

- Define pattern multiplication and derive the equation for the Array factor of n-isotropic point sources.
- Explain slot antenna in detail. What is the difference between slot antenna and its complementary antenna?
- Explain any four parameters of an antenna.

**Section – II**

**Q.4 Attempt the following question. 12**

- Why log periodic antenna is named so far? Explain log periodic antenna in detail.
- How the antenna gain can be measured by using Absolute method.

**OR**

- How the radiation pattern of an antenna is measured?
- What do you mean by Spiral antenna? Write the equations for frequencies defined to design spiral antenna.

**Q.5 Attempt any two of the following question. 16**

- Draw and explain various feeding mechanism of parabolic reflector antenna.
- Explain different types of Horn antenna. Write the applications of Horn antenna.
- Explain following characteristic parameters of Ionospheric propagation.
  - Virtual height
  - Critical frequency
  - Maximum Usable frequency
  - Skip distance

Seat No.	
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Set Q
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Antenna & Wave Propagation**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following antennas is used as feed antenna at microwave frequencies?
 

a) Single dipole	b) Folded dipole
c) Rhombic	d) Horn
- 2) Waveguide fed slots give radiation \_\_\_\_\_.
 

a) Single side	b) Both sides equally
c) Both sides unequally	d) None
- 3) Slot and dipole impedances are related by the equation \_\_\_\_\_.
 

a) $Z_s Z_d = Z_0^2$	b) $Z_s Z_d = Z_0^2/4$
c) $Z_s Z_d = Z_0^2/2$	d) None of these
- 4) Radiation pattern denoting angle of E in different directions is \_\_\_\_\_.
 

a) Amplitude pattern	b) Phase pattern
c) Magnitude pattern	d) Polarization pattern
- 5) If three identical antennas are available, the gain is measured using \_\_\_\_\_.
 

a) Two antenna method	b) Three antenna method
c) Gain transfer method	d) None
- 6) Space wave propagation occurs at frequencies \_\_\_\_\_.
 

a) Below HF	b) In HF
c) Above HF	d) None
- 7) In ground wave propagation, the antennas must be located \_\_\_\_\_.
 

a) Near the earth's surface	b) At a height from earth's surface
c) Either a or b	d) None
- 8) The Effective area and directivity are related by \_\_\_\_\_.
 

a) $D = \frac{4\pi A_e}{\lambda}$	b) $D = \frac{4\pi A_e}{\lambda^2}$
c) $D = \frac{4\pi D}{\lambda}$	d) None of the above

- 9) Total field pattern of the array depends on \_\_\_\_\_.  
a) Geometrical configuration  
b) Distance between the elements  
c) Excitation phase of individual elements  
d) All of the above
- 10) If the maximum radiation is normal to the length of the array, it is \_\_\_\_\_.  
a) Broadside array  
b) End fire array  
c) Hansen-wood yard array  
d) None
- 11) The array factor depends on the following parameters.  
i) Geometrical arrangement      ii) Spacing  
iii) Number of elements      iv) Unit pattern  
a) i & ii only      b) ii & iv only  
c) i, ii & iii only      d) i, ii, iii & iv
- 12) When circumference of Helix is one wavelength, then the antenna must be working in \_\_\_\_\_.  
a) Axial mode      b) End-fire mode  
c) Both a and b      d) Normal mode
- 13) Plane sheet and corner reflector antenna produce patterns \_\_\_\_\_.  
a) Omni directional      b) Broadside  
c) End fire      d) None of these
- 14) For small spacing between the reflector and driven element \_\_\_\_\_.  
a) Gain is less but bandwidth is larger  
b) Gain is high but bandwidth is less  
c) Gain is high and bandwidth is high  
d) Gain is less but bandwidth is less

Seat No.	
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Set Q
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Antenna & Wave Propagation**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following question. 12**

- Explain various antenna field zones and their boundaries with neat sketches.
- Calculate the directivity of 20 turns helix, having  $\alpha = 12^\circ$  and circumference equal to one wavelength.
- What is the need for antenna array? Explain with the types.
- Explain Babinet's principle with its features.

**Q.3 Attempt any two of the following question. 16**

- Define pattern multiplication and derive the equation for the Array factor of n-isotropic point sources.
- Explain slot antenna in detail. What is the difference between slot antenna and its complementary antenna?
- Explain any four parameters of an antenna.

**Section – II**

**Q.4 Attempt the following question. 12**

- Why log periodic antenna is named so far? Explain log periodic antenna in detail.
- How the antenna gain can be measured by using Absolute method.

**OR**

- How the radiation pattern of an antenna is measured?
- What do you mean by Spiral antenna? Write the equations for frequencies defined to design spiral antenna.

**Q.5 Attempt any two of the following question. 16**

- Draw and explain various feeding mechanism of parabolic reflector antenna.
- Explain different types of Horn antenna. Write the applications of Horn antenna.
- Explain following characteristic parameters of Ionospheric propagation.
  - Virtual height
  - Critical frequency
  - Maximum Usable frequency
  - Skip distance

Seat No.	
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Set	R
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Antenna & Wave Propagation**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) Radiation pattern denoting angle of E in different directions is \_\_\_\_\_.  
 a) Amplitude pattern                      b) Phase pattern  
 c) Magnitude pattern                      d) Polarization pattern
- 2) If three identical antennas are available, the gain is measured using \_\_\_\_\_.  
 a) Two antenna method                      b) Three antenna method  
 c) Gain transfer method                      d) None
- 3) Space wave propagation occurs at frequencies \_\_\_\_\_.  
 a) Below HF                                      b) In HF  
 c) Above HF                                      d) None
- 4) In ground wave propagation, the antennas must be located \_\_\_\_\_.  
 a) Near the earth's surface                      b) At a height from earth's surface  
 c) Either a or b                                      d) None
- 5) The Affective area and directivity are related by \_\_\_\_\_.  
 a)  $D = \frac{4\pi A_e}{\lambda}$                                       b)  $D = \frac{4\pi A_e}{\lambda^2}$   
 c)  $D = \frac{4\pi D}{\lambda}$                                       d) None of the above
- 6) Total field pattern of the array depends on \_\_\_\_\_.  
 a) Geometrical configuration  
 b) Distance between the elements  
 c) Excitation phase of individual elements  
 d) All of the above
- 7) If the maximum radiation is normal to the length of the array, it is \_\_\_\_\_.  
 a) Broadside array                                      b) End fire array  
 c) Hansen-wood yard array                      d) None
- 8) The array factor depends on the following parameters.  
 i) Geometrical arrangement                      ii) Spacing  
 iii) Number of elements                      iv) Unit pattern  
 a) i & ii only                                      b) ii & iv only  
 c) i, ii & iii only                                      d) i, ii, iii & iv

- 9) When circumference of Helix is one wavelength, then the antenna must be working in \_\_\_\_\_.
  - a) Axial mode
  - b) End-fire mode
  - c) Both a and b
  - d) Normal mode
- 10) Plane sheet and corner reflector antenna produce patterns \_\_\_\_\_.
  - a) Omni directional
  - b) Broadside
  - c) End fire
  - d) None of these
- 11) For small spacing between the reflector and driven element \_\_\_\_\_.
  - a) Gain is less but bandwidth is larger
  - b) Gain is high but bandwidth is less
  - c) Gain is high and bandwidth is high
  - d) Gain is less but bandwidth is less
- 12) Which of the following antennas is used as feed antenna at microwave frequencies?
  - a) Single dipole
  - b) Folded dipole
  - c) Rhombic
  - d) Horn
- 13) Waveguide fed slots give radiation \_\_\_\_\_.
  - a) Single side
  - b) Both sides equally
  - c) Both sides unequally
  - d) None
- 14) Slot and dipole impedances are related by the equation \_\_\_\_\_.
  - a)  $Z_s Z_d = Z_0^2$
  - b)  $Z_s Z_d = Z_0^2 / 4$
  - c)  $Z_s Z_d = Z_0^2 / 2$
  - d) None of these

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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Antenna & Wave Propagation**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following question. 12**

- Explain various antenna field zones and their boundaries with neat sketches.
- Calculate the directivity of 20 turns helix, having  $\alpha = 12^\circ$  and circumference equal to one wavelength.
- What is the need for antenna array? Explain with the types.
- Explain Babinet's principle with its features.

**Q.3 Attempt any two of the following question. 16**

- Define pattern multiplication and derive the equation for the Array factor of n-isotropic point sources.
- Explain slot antenna in detail. What is the difference between slot antenna and its complementary antenna?
- Explain any four parameters of an antenna.

**Section – II**

**Q.4 Attempt the following question. 12**

- Why log periodic antenna is named so far? Explain log periodic antenna in detail.
- How the antenna gain can be measured by using Absolute method.

**OR**

- How the radiation pattern of an antenna is measured?
- What do you mean by Spiral antenna? Write the equations for frequencies defined to design spiral antenna.

**Q.5 Attempt any two of the following question. 16**

- Draw and explain various feeding mechanism of parabolic reflector antenna.
- Explain different types of Horn antenna. Write the applications of Horn antenna.
- Explain following characteristic parameters of Ionospheric propagation.
  - Virtual height
  - Critical frequency
  - Maximum Usable frequency
  - Skip distance



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Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- Page 10 of 12



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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Antenna & Wave Propagation**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following question. 12**

- Explain various antenna field zones and their boundaries with neat sketches.
- Calculate the directivity of 20 turns helix, having  $\alpha = 12^\circ$  and circumference equal to one wavelength.
- What is the need for antenna array? Explain with the types.
- Explain Babinet's principle with its features.

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- Define pattern multiplication and derive the equation for the Array factor of n-isotropic point sources.
- Explain slot antenna in detail. What is the difference between slot antenna and its complementary antenna?
- Explain any four parameters of an antenna.

**Section – II**

**Q.4 Attempt the following question. 12**

- Why log periodic antenna is named so far? Explain log periodic antenna in detail.
- How the antenna gain can be measured by using Absolute method.

**OR**

- How the radiation pattern of an antenna is measured?
- What do you mean by Spiral antenna? Write the equations for frequencies defined to design spiral antenna.

**Q.5 Attempt any two of the following question. 16**

- Draw and explain various feeding mechanism of parabolic reflector antenna.
- Explain different types of Horn antenna. Write the applications of Horn antenna.
- Explain following characteristic parameters of Ionospheric propagation.
  - Virtual height
  - Critical frequency
  - Maximum Usable frequency
  - Skip distance

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Embedded System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) ARM uses the thumb \_\_\_\_\_ bit instruction set to improve code density.
  - a) 32
  - b) 8
  - c) 64
  - d) 16
- 2) Where is the return address stored after execution of the Branch-and-Link (BL) instruction in ARM?
  - a) In the stack
  - b) In the register r14
  - c) In the program counter pc
  - d) None of these.
- 3) In LPC 2148 \_\_\_\_\_ register is used to configure port pins P0.0 to P0.15 as GPIO.
  - a) PINSEL1
  - b) PINSEL0
  - c) IODIR2
  - d) IOSET0
- 4) NRE cost can be defined by \_\_\_\_\_.
  - a) The one-time monetary cost of designing the system
  - b) Life time cost of system
  - c) Depends upon embedded systems
  - d) None of the these
- 5) A privileged mode allows
  - a) Full read access to cpsr
  - b) Full read write access to cpsr
  - c) Full write access to cpsr
  - d) Full read write access to spsr
- 6) The \_\_\_\_\_ directive allows the programmer to specify the memory locations where programs, subroutines or the data will reside.
  - a) ALIGN
  - b) AREA
  - c) ENTRY
  - d) END
- 7) An Embedded system executes a specific program repeatedly called as \_\_\_\_\_.
  - a) Reactive system
  - b) Tightly constrained
  - c) Single functioned
  - d) None of the above
- 8) Switching the CPU to another process requires to save state of the old process and loading new process state is called \_\_\_\_\_.
  - a) Process blocking
  - b) Context switch
  - c) Time sharing
  - d) None of these

- 9) Which is the core of the OS?
- a) shell
  - b) Kernel
  - c) commands
  - d) scripts
- 10) Information about a task is maintained in a \_\_\_\_\_. .
- a) stack
  - b) translation look aside buffer
  - c) Task control block
  - d) Task
- 11) Semaphore is used to \_\_\_\_\_
- a) signal the occurrence of event
  - b) Show interfacing between input and output devices
  - c) Provide memory management
  - d) None of these
- 12) Which type of following OS the response time is critical?
- a) Network operating System
  - b) Real Time operating System
  - c) Batch OS
  - d) Unix operating system
- 13) A relationship between processes such that each has some part (critical section) which must not be executed while the critical section of another is being executed, is known as
- a) semaphore
  - b) mutual exclusion
  - c) multiprogramming
  - d) multitasking
- 14) In rate monotonic scheduling \_\_\_\_\_
- a) shorter duration job has higher priority
  - b) longer duration job has higher priority
  - c) priority does not depend on the duration of the job
  - d) none of the mentioned

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Embedded System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicate full marks.  
3) Assumes suitable data if necessary.  
4) Draw neat diagram whenever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) What are design metrics? Explain any one in detail. How to optimize design metrics?
- b) Explain on chip DAC of LPC2148 using associated register.
- c) Describe the operation with example of any two ARM instructions.  
a) MOV b) STR c) MLA d) BX
- d) Explain the role of AMBA bus architecture in LPC2148.
- e) Explain in brief operating modes of ARM7 processor.

**Q.3 Attempt any two.** **12**

- a) Draw and explain ARM core data flow model of ARM7 processor.
- b) Explain the concept of following peripherals in LPC2148  
a) Timer/Counter b) WDT
- c) Draw and explain Internal block diagram architecture of LPC2148.

**Section – II**

**Q.4 Answer any four questions.** **16**

- a) List features of UCOSII RTOs.
- b) Write an Embedded C code to demonstrate operation of on-chip DAC of LPC2148.
- c) What are the services provided by desktop or traditional OS?
- d) Write the Embedded C program to interface & blink eight LED's to LPC2148 along with necessary circuit diagram.
- e) Explain digital camera as embedded system. How to measure its performance.

**Q.5 Answer any two questions.** **12**

- a) With suitable example explain the role of semaphore in Operating system.
- b) Draw & Explain architecture of Embedded system OS Kernel.
- c) Draw interfacing of stepper motor with LPC2148 & Write the embedded C program for the same.

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Embedded System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Switching the CPU to another process requires to save state of the old process and loading new process state is called \_\_\_\_\_.  
a) Process blocking                      b) Context switch  
c) Time sharing                          d) None of these
- 2) Which is the core of the OS?  
a) shell                                      b) Kernel  
c) commands                              d) scripts
- 3) Information about a task is maintained in a \_\_\_\_\_.  
a) stack  
b) translation look aside buffer  
c) Task control block  
d) Task
- 4) Semaphore is used to \_\_\_\_\_.  
a) signal the occurrence of event  
b) Show interfacing between input and output devices  
c) Provide memory management  
d) None of these
- 5) Which type of following OS the response time is critical?  
a) Network operating System  
b) Real Time operating System  
c) Batch OS  
d) Unix operating system
- 6) A relationship between processes such that each has some part (critical section) which must not be executed while the critical section of another is being executed, is known as  
a) semaphore                              b) mutual exclusion  
c) multiprogramming                      d) multitasking

- 7) In rate monotonic scheduling \_\_\_\_\_
- a) shorter duration job has higher priority
  - b) longer duration job has higher priority
  - c) priority does not depend on the duration of the job
  - d) none of the mentioned
- 8) ARM uses the thumb \_\_\_\_\_ bit instruction set to improve code density.
- a) 32
  - b) 8
  - c) 64
  - d) 16
- 9) Where is the return address stored after execution of the Branch-and-Link (BL) instruction in ARM?
- a) In the stack
  - b) In the register r14
  - c) In the program counter pc
  - d) None of these.
- 10) In LPC 2148 \_\_\_\_\_ register is used to configure port pins P0.0 to P0.15 as GPIO.
- a) PINSEL1
  - b) PINSEL0
  - c) IODIR2
  - d) IOSET0
- 11) NRE cost can be defined by \_\_\_\_\_.
- a) The one-time monetary cost of designing the system
  - b) Life time cost of system
  - c) Depends upon embedded systems
  - d) None of the these
- 12) A privileged mode allows
- a) Full read access to cpsr
  - b) Full read write access to cpsr
  - c) Full write access to cpsr
  - d) Full read write access to spsr
- 13) The \_\_\_\_\_ directive allows the programmer to specify the memory locations where programs, subroutines or the data will reside.
- a) ALIGN
  - b) AREA
  - c) ENTRY
  - d) END
- 14) An Embedded system executes a specific program repeatedly called as \_\_\_\_\_
- a) Reactive system
  - b) Tightly constrained
  - c) Single functioned
  - d) None of the above



<b>Seat No.</b>	
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**Set Q**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Embedded System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicate full marks.  
3) Assumes suitable data if necessary.  
4) Draw neat diagram whenever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) What are design metrics? Explain any one in detail. How to optimize design metrics?
- b) Explain on chip DAC of LPC2148 using associated register.
- c) Describe the operation with example of any two ARM instructions.  
a) MOV b) STR c) MLA d) BX
- d) Explain the role of AMBA bus architecture in LPC2148.
- e) Explain in brief operating modes of ARM7 processor.

**Q.3 Attempt any two.** **12**

- a) Draw and explain ARM core data flow model of ARM7 processor.
- b) Explain the concept of following peripherals in LPC2148  
a) Timer/Counter b) WDT
- c) Draw and explain Internal block diagram architecture of LPC2148.

**Section – II**

**Q.4 Answer any four questions.** **16**

- a) List features of UCOSII RTOs.
- b) Write an Embedded C code to demonstrate operation of on-chip DAC of LPC2148.
- c) What are the services provided by desktop or traditional OS?
- d) Write the Embedded C program to interface & blink eight LED's to LPC2148 along with necessary circuit diagram.
- e) Explain digital camera as embedded system. How to measure its performance.

**Q.5 Answer any two questions.** **12**

- a) With suitable example explain the role of semaphore in Operating system.
- b) Draw & Explain architecture of Embedded system OS Kernel.
- c) Draw interfacing of stepper motor with LPC2148 & Write the embedded C program for the same.

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Embedded System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Semaphore is used to \_\_\_\_\_.
  - a) signal the occurrence of event
  - b) Show interfacing between input and output devices
  - c) Provide memory management
  - d) None of these
- 2) Which type of following OS the response time is critical?
  - a) Network operating System
  - b) Real Time operating System
  - c) Batch OS
  - d) Unix operating system
- 3) A relationship between processes such that each has some part (critical section) which must not be executed while the critical section of another is being executed, is known as
 

a) semaphore	b) mutual exclusion
c) multiprogramming	d) multitasking
- 4) In rate monotonic scheduling \_\_\_\_\_.
  - a) shorter duration job has higher priority
  - b) longer duration job has higher priority
  - c) priority does not depend on the duration of the job
  - d) none of the mentioned
- 5) ARM uses the thumb \_\_\_\_\_ bit instruction set to improve code density.
 

a) 32	b) 8
c) 64	d) 16
- 6) Where is the return address stored after execution of the Branch-and-Link (BL) instruction in ARM?
 

a) In the stack	b) In the register r14
c) In the program counter pc	d) None of these.
- 7) In LPC 2148 \_\_\_\_\_ register is used to configure port pins P0.0 to P0.15 as GPIO.
 

a) PINSEL1	b) PINSEL0
c) IODIR2	d) IOSET0

- 8) NRE cost can be defined by \_\_\_\_\_.  
a) The one-time monetary cost of designing the system  
b) Life time cost of system  
c) Depends upon embedded systems  
d) None of the these
- 9) A privileged mode allows  
a) Full read access to cpsr                      b) Full read write access to cpsr  
c) Full write access to cpsr                      d) Full read write access to spsr
- 10) The \_\_\_\_\_ directive allows the programmer to specify the memory locations where programs, subroutines or the data will reside.  
a) ALIGN    b) AREA  
c) ENTRY    d) END
- 11) An Embedded system executes a specific program repeatedly called as \_\_\_\_\_.  
a) Reactive system                                  b) Tightly constrained  
c) Single functioned                                  d) None of the above
- 12) Switching the CPU to another process requires to save state of the old process and loading new process state is called \_\_\_\_\_.  
a) Process blocking                                  b) Context switch  
c) Time sharing                                      d) None of these
- 13) Which is the core of the OS?  
a) shell    b) Kernel  
c) commands    d) scripts
- 14) Information about a task is maintained in a \_\_\_\_\_.  
a) stack  
b) translation look aside buffer  
c) Task control block  
d) Task

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Embedded System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicate full marks.  
3) Assumes suitable data if necessary.  
4) Draw neat diagram whenever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) What are design metrics? Explain any one in detail. How to optimize design metrics?
- b) Explain on chip DAC of LPC2148 using associated register.
- c) Describe the operation with example of any two ARM instructions.  
a) MOV b) STR c) MLA d) BX
- d) Explain the role of AMBA bus architecture in LPC2148.
- e) Explain in brief operating modes of ARM7 processor.

**Q.3 Attempt any two.** **12**

- a) Draw and explain ARM core data flow model of ARM7 processor.
- b) Explain the concept of following peripherals in LPC2148  
a) Timer/Counter b) WDT
- c) Draw and explain Internal block diagram architecture of LPC2148.

**Section – II**

**Q.4 Answer any four questions.** **16**

- a) List features of UCOSII RTOs.
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- c) What are the services provided by desktop or traditional OS?
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**Q.5 Answer any two questions.** **12**

- a) With suitable example explain the role of semaphore in Operating system.
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Embedded System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The \_\_\_\_\_ directive allows the programmer to specify the memory locations where programs, subroutines or the data will reside.
  - a) ALIGN
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  - c) ENTRY
  - d) END
- 2) An Embedded system executes a specific program repeatedly called as \_\_\_\_\_.
  - a) Reactive system
  - b) Tightly constrained
  - c) Single functioned
  - d) None of the above
- 3) Switching the CPU to another process requires to save state of the old process and loading new process state is called \_\_\_\_\_.
  - a) Process blocking
  - b) Context switch
  - c) Time sharing
  - d) None of these
- 4) Which is the core of the OS?
  - a) shell
  - b) Kernel
  - c) commands
  - d) scripts
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  - d) Task
- 6) Semaphore is used to \_\_\_\_\_.
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  - c) Provide memory management
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  - c) Batch OS
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- 8) A relationship between processes such that each has some part (critical section) which must not be executed while the critical section of another is being executed, is known as
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- 10) ARM uses the thumb \_\_\_\_\_ bit instruction set to improve code density.
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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Embedded System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicate full marks.  
3) Assumes suitable data if necessary.  
4) Draw neat diagram whenever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) What are design metrics? Explain any one in detail. How to optimize design metrics?
- b) Explain on chip DAC of LPC2148 using associated register.
- c) Describe the operation with example of any two ARM instructions.  
a) MOV b) STR c) MLA d) BX
- d) Explain the role of AMBA bus architecture in LPC2148.
- e) Explain in brief operating modes of ARM7 processor.

**Q.3 Attempt any two.** **12**

- a) Draw and explain ARM core data flow model of ARM7 processor.
- b) Explain the concept of following peripherals in LPC2148  
a) Timer/Counter b) WDT
- c) Draw and explain Internal block diagram architecture of LPC2148.

**Section – II**

**Q.4 Answer any four questions.** **16**

- a) List features of UCOSII RTOs.
- b) Write an Embedded C code to demonstrate operation of on-chip DAC of LPC2148.
- c) What are the services provided by desktop or traditional OS?
- d) Write the Embedded C program to interface & blink eight LED's to LPC2148 along with necessary circuit diagram.
- e) Explain digital camera as embedded system. How to measure its performance.

**Q.5 Answer any two questions.** **12**

- a) With suitable example explain the role of semaphore in Operating system.
- b) Draw & Explain architecture of Embedded system OS Kernel.
- c) Draw interfacing of stepper motor with LPC2148 & Write the embedded C program for the same.

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- 8) The time period of IC 2240 is given as \_\_\_\_\_.
  - a)  $T = RC$
  - b)  $T = 0.67RC$
  - c)  $T = 0.7 RC$
  - d) None of the above
- 9) The number of digits required to count frequency ratio of 10000 with  $\pm 1$  accuracy is \_\_\_\_\_.
  - a) 5-digit
  - b) 4-digit
  - c) 3-digit
  - d) 6-digit
- 10) How many clock cycles are present in 100 kHz signal for 20 ms period?
  - a) 200
  - b) 100
  - c) 2000
  - d) 1000
- 11) Which of the following is self-powered temperature sensor?
  - a) Thermocouple
  - b) RTD
  - c) Thermistor
  - d) None of these
- 12) The set point voltage for a desired temperature of 50 degree C with sensor sensitivity of  $50 \mu V/\text{degree C}$  is \_\_\_\_\_.
  - a) 25 mV
  - b) 2.5 mV
  - c) 1 mV
  - d)  $1 \mu V$
- 13) Zero and span circuit is used as \_\_\_\_\_.
  - a) V to V converter
  - b) V to I converter
  - c) I to V converter
  - d) All of above
- 14) Each row in the ladder diagram is called \_\_\_\_\_.
  - a) Input
  - b) Rung
  - c) Output
  - d) None Of These

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electronic System Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Answer any FOUR.** **16**

- a) Sketch V-I characteristics of DIAC and explain its principal of working.
- b) What is meant by commutation? Explain Class A commutation method.
- c) Explain AC power control using TRIAC for fan regulator.
- d) Derive an exp for Avg voltage and RMS Voltage for half wave-controlled rectifier with resistive load.
- e) Explain the use of balanced modulator as AM modulator.

**Q.3 Answer any TWO.** **12**

- a) Derive the expression for relationship between collector current and base current in SCR using two transistor analogy and also show that once the SCR is triggered, there is no change in the working of SCR even if gate pulse (Gate current) is removed.
- b) Describe the working of single phase fully controlled bridge rectifier with resistive load. Sketch the following waveforms for  $\alpha = 60^\circ$  and  $\alpha = 120^\circ$ .
  - 1) Load voltage waveform
  - 2) Load current waveform
  - 3) Thyristor current and voltage waveform
  - 4) Supply voltage and current waveform.
 Analyze the waveforms and comment on effect of firing angle  $\alpha$  on its working.
- c) Design a frequency synthesizer to generate a frequency of 5000 KHz using PLL 565. Draw the complete connection diagram.

**Section – II**

**Q.4 Answer any FOUR.** **16**

- a) Design a timer using IC XR 2240 to generate a delay of 50 sec.
- b) Design a Zero -Span circuit to convert 1.6 V - 2.75 V to 0 - 5 V.
- c) Explain cold junction compensation.
- d) Draw and explain PLC architecture.
- e) Design a signal conditioning circuit to get a voltage of 0 to 10 V from a temperature of  $0^\circ\text{C}$  to  $150^\circ\text{C}$  using PT100 temperature sensor.

**Q.5 Answer any TWO.** **12**

- a) Design a ON-OFF controller for temperature range of  $0^\circ\text{C}$  to  $200^\circ\text{C}$  with a set point of  $50^\circ\text{C}$ . Use LM35 temperature sensor.
- b) Design a DVM for the measurement of 2 V input voltage.
- c) Design a frequency counter using IC 74926, to count frequency upto 1000 Hz with accuracy of 0.1 Hz.

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No.**

Max. Marks: 70

- 10) In commutation circuit, employed to turn off an SCR, satisfactory turn off time is obtained \_\_\_\_\_.  
a) Circuit turn off time is less than device turn off time  
b) Circuit turn off time is greater than device turn off time  
c) Circuit time constant is greater than device turn off time  
d) Circuit time constant is less than device turn off time
- 11) A single phase fully controlled bridge converter supplies an Inductive load. If  $\alpha = 0^\circ$ , then average de voltage is \_\_\_\_\_.  
a)  $\frac{V_m}{\pi}$   
b)  $\frac{2V_m}{\pi}$   
c)  $\frac{V_m}{\sqrt{2}}$   
d)  $0.95V_m$
- 12) A freewheeling diode in phase-controlled rectifiers.  
a) Stops rectifier operations  
b) Improves line power factor  
c) Is the reason for additional harmonics  
d) Is the reason for the sudden breakdown
- 13) In PLL, input signal frequency is compared with which one of the following.  
a) VCO output  
b) Phase comparator output  
c) Either A or B  
d) None of the above
- 14) Which of the following is balance modulator-demodulator?  
a) IC 74C926  
b) IC 1596  
c) IC 2240  
d) IC 565

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electronic System Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Answer any FOUR. 16**

- Sketch V-I characteristics of DIAC and explain its principal of working.
- What is meant by commutation? Explain Class A commutation method.
- Explain AC power control using TRIAC for fan regulator.
- Derive an exp for Avg voltage and RMS Voltage for half wave-controlled rectifier with resistive load.
- Explain the use of balanced modulator as AM modulator.

**Q.3 Answer any TWO. 12**

- Derive the expression for relationship between collector current and base current in SCR using two transistor analogy and also show that once the SCR is triggered, there is no change in the working of SCR even if gate pulse (Gate current) is removed.
- Describe the working of single phase fully controlled bridge rectifier with resistive load. Sketch the following waveforms for  $\alpha = 60^\circ$  and  $\alpha = 120^\circ$ .
  - Load voltage waveform
  - Load current waveform
  - Thyristor current and voltage waveform
  - Supply voltage and current waveform.
 Analyze the waveforms and comment on effect of firing angle  $\alpha$  on its working.
- Design a frequency synthesizer to generate a frequency of 5000 KHz using PLL 565. Draw the complete connection diagram.

**Section – II**

**Q.4 Answer any FOUR. 16**

- Design a timer using IC XR 2240 to generate a delay of 50 sec.
- Design a Zero -Span circuit to convert 1.6 V - 2.75 V to 0 - 5 V.
- Explain cold junction compensation.
- Draw and explain PLC architecture.
- Design a signal conditioning circuit to get a voltage of 0 to 10 V from a temperature of  $0^\circ\text{C}$  to  $150^\circ\text{C}$  using PT100 temperature sensor.

**Q.5 Answer any TWO. 12**

- Design a ON-OFF controller for temperature range of  $0^\circ\text{C}$  to  $200^\circ\text{C}$  with a set point of  $50^\circ\text{C}$ . Use LM35 temperature sensor.
- Design a DVM for the measurement of 2 V input voltage.
- Design a frequency counter using IC 74926, to count frequency upto 1000 Hz with accuracy of 0.1 Hz.

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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.
- 2) Don't forget to mention the Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Assume suitable data wherever needed and mention it clearly.

Marks: 14

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electronic System Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Answer any FOUR.** **16**

- a) Sketch V-I characteristics of DIAC and explain its principal of working.
- b) What is meant by commutation? Explain Class A commutation method.
- c) Explain AC power control using TRIAC for fan regulator.
- d) Derive an exp for Avg voltage and RMS Voltage for half wave-controlled rectifier with resistive load.
- e) Explain the use of balanced modulator as AM modulator.

**Q.3 Answer any TWO.** **12**

- a) Derive the expression for relationship between collector current and base current in SCR using two transistor analogy and also show that once the SCR is triggered, there is no change in the working of SCR even if gate pulse (Gate current) is removed.
- b) Describe the working of single phase fully controlled bridge rectifier with resistive load. Sketch the following waveforms for  $\alpha = 60^\circ$  and  $\alpha = 120^\circ$ .
  - 1) Load voltage waveform
  - 2) Load current waveform
  - 3) Thyristor current and voltage waveform
  - 4) Supply voltage and current waveform.
 Analyze the waveforms and comment on effect of firing angle  $\alpha$  on its working.
- c) Design a frequency synthesizer to generate a frequency of 5000 KHz using PLL 565. Draw the complete connection diagram.

**Section – II**

**Q.4 Answer any FOUR.** **16**

- a) Design a timer using IC XR 2240 to generate a delay of 50 sec.
- b) Design a Zero -Span circuit to convert 1.6 V - 2.75 V to 0 - 5 V.
- c) Explain cold junction compensation.
- d) Draw and explain PLC architecture.
- e) Design a signal conditioning circuit to get a voltage of 0 to 10 V from a temperature of  $0^\circ\text{C}$  to  $150^\circ\text{C}$  using PT100 temperature sensor.

**Q.5 Answer any TWO.** **12**

- a) Design a ON-OFF controller for temperature range of  $0^\circ\text{C}$  to  $200^\circ\text{C}$  with a set point of  $50^\circ\text{C}$ . Use LM35 temperature sensor.
- b) Design a DVM for the measurement of 2 V input voltage.
- c) Design a frequency counter using IC 74926, to count frequency upto 1000 Hz with accuracy of 0.1 Hz.



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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electronic System Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 3 (starting page of the Answer Book). Each the question carries one mark.  
 2) Don't forget to mention the Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the option. 14**

- 1) In PLL, input signal frequency is compared with which one of the following.
 

a) VCO output	b) Phase comparator output
c) Either A or B	d) None of the above
- 2) Which of the following is balance modulator-demodulator?
 

a) IC 74C926	b) IC 1596
c) IC 2240	d) IC 565
- 3) The time period of IC 2240 is given as \_\_\_\_\_.
 

a) $T = RC$	b) $T = 0.67RC$
c) $T = 0.7 RC$	d) None of the above
- 4) The number of digits required to count frequency ratio of 10000 with  $\pm 1$  accuracy is \_\_\_\_\_.
 

a) 5-digit	b) 4-digit
c) 3-digit	d) 6-digit
- 5) How many clock cycles are present in 100 kHz signal for 20 ms period?
 

a) 200	b) 100
c) 2000	d) 1000
- 6) Which of the following is self-powered temperature sensor?
 

a) Thermocouple	b) RTD
c) Thermistor	d) None of these
- 7) The set point voltage for a desired temperature of 50 degree C with sensor sensitivity of  $50 \mu\text{V}/\text{degree C}$  is \_\_\_\_\_.
 

a) 25 mV	b) 2.5 mV
c) 1 mV	d) $1 \mu\text{V}$
- 8) Zero and span circuit is used as \_\_\_\_\_.
 

a) V to V converter	b) V to I converter
c) I to V converter	d) All of above



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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electronic System Design**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Answer any FOUR.** **16**

- a) Sketch V-I characteristics of DIAC and explain its principal of working.
- b) What is meant by commutation? Explain Class A commutation method.
- c) Explain AC power control using TRIAC for fan regulator.
- d) Derive an exp for Avg voltage and RMS Voltage for half wave-controlled rectifier with resistive load.
- e) Explain the use of balanced modulator as AM modulator.

**Q.3 Answer any TWO.** **12**

- a) Derive the expression for relationship between collector current and base current in SCR using two transistor analogy and also show that once the SCR is triggered, there is no change in the working of SCR even if gate pulse (Gate current) is removed.
- b) Describe the working of single phase fully controlled bridge rectifier with resistive load. Sketch the following waveforms for  $\alpha = 60^\circ$  and  $\alpha = 120^\circ$ .
  - 1) Load voltage waveform
  - 2) Load current waveform
  - 3) Thyristor current and voltage waveform
  - 4) Supply voltage and current waveform.
 Analyze the waveforms and comment on effect of firing angle  $\alpha$  on its working.
- c) Design a frequency synthesizer to generate a frequency of 5000 KHz using PLL 565. Draw the complete connection diagram.

**Section – II**

**Q.4 Answer any FOUR.** **16**

- a) Design a timer using IC XR 2240 to generate a delay of 50 sec.
- b) Design a Zero -Span circuit to convert 1.6 V - 2.75 V to 0 - 5 V.
- c) Explain cold junction compensation.
- d) Draw and explain PLC architecture.
- e) Design a signal conditioning circuit to get a voltage of 0 to 10 V from a temperature of  $0^\circ\text{C}$  to  $150^\circ\text{C}$  using PT100 temperature sensor.

**Q.5 Answer any TWO.** **12**

- a) Design a ON-OFF controller for temperature range of  $0^\circ\text{C}$  to  $200^\circ\text{C}$  with a set point of  $50^\circ\text{C}$ . Use LM35 temperature sensor.
- b) Design a DVM for the measurement of 2 V input voltage.
- c) Design a frequency counter using IC 74926, to count frequency upto 1000 Hz with accuracy of 0.1 Hz.

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Advanced Mobile Communication**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which of the following is/are the main part(s) of basic cellular system?
  - a) A mobile Unit
  - b) A Base Station
  - c) A Mobile Telephone Switching Office
  - d) All of the above
- 2) Fading of the received radio signals in a mobile communication environment occurs because of \_\_\_\_\_.
  - a) Direct propagation
  - b) Multipath Propagation
  - c) Bi-path Propagation
  - d) None of the above
- 3) In \_\_\_\_\_ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
  - a) TDMA
  - b) CDMA
  - c) FDMA
  - d) FGMA
- 4) The antenna which attempts to direct all its energy in a particular direction is called as a \_\_\_\_\_.
  - a) Directional Antenna
  - b) One to One Antenna
  - c) Propagation Antenna
  - d) Single Direction Antenna
- 5) Reflection is?
  - a) Propagation mode
  - b) Propagation mechanism
  - c) Spread spectrum
  - d) None of the above
- 6) What is Fraunhofer distance for  $f = 1800$  MHz and largest linear antenna dimension is 0.5?
  - a) 1.5 m
  - b) 2 m
  - c) 3 m
  - d) None of these
- 7) The model considered for both direct path and ground reflected propagation path between T-R is \_\_\_\_\_.
  - a) Hata model
  - b) Two ray model
  - c) Free space model
  - d) Okumura model



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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Advanced Mobile Communication**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following:** **16**

- 1) Explain frequency reuse technique in cellular system.
- 2) A spectrum of 30 MHz is allocated to a wireless FDD cellular system which uses two 25 KHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (i) four cell reuse, (ii) seven cell reuse (iii) 12 cell reuse.
- 3) Explain channel assignment strategies in cellular system
- 4) Find the Fraunhofer distance for an antenna with maximum dimension of 1 m and operating frequency of 900 MHz. If antenna have unity gain calculate the path loss.

**Q.3 Attempt any two of the following.** **12**

- 1) Explain in brief different methods used to improve capacity of cellular system.
- 2) For a given path loss exponent i)  $n = 4$  ii)  $n = 3$  find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal to interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are 6 co-channel cells in the first tier and all of them are at the same distance from the mobile.
- 3) Explain ground reflection or two ray model and prove that path difference  $\Delta = (2 h_t h_r)/d$

**Section – II**

**Q.4 Attempt any three of the following:** **16**

- 1) Explain frequency and channel specification in IS-95 CDMA system.
- 2) Write a short note on GSM system architecture.
- 3) Explain GSM frames in detail.
- 4) Explain mobile call origination sequence in GSM.

**Q.5 Attempt any two of the following.** **12**

- 1) Draw and explain GPRS network architecture in detail.
- 2) Draw 4G/LTE architecture and explain.
- 3) Explain packet and frame format for forward and reverse CDMA IS-95 channels.

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Set Q
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Advanced Mobile Communication**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Modulation technique used in CDMA 2000 is \_\_\_\_\_.  
 a) Uplink – QPSK, Downlink – BPSK  
 b) Uplink – BPSK, Downlink – QPSK  
 c) Uplink – BPSK, Downlink – BPSK  
 d) None of the above
- 2) In GSM the uplink frequency band is \_\_\_\_\_.  
 a) 890-915 MHz  
 b) 935-960 MHz  
 c) 890-935 MHz  
 d) 917-945 MHz
- 3) An interface which connects a BTS to a BSC is called \_\_\_\_\_ interface.  
 a) Channel Interface  
 b) Signaling Interface  
 c) Abis Interface  
 d) None of these
- 4) IMT 2000 stands for \_\_\_\_\_.  
 a) International Mobile Telecommunication  
 b) Interim Mobile Telecommunication  
 c) International Mobile Technology  
 d) None of these
- 5) In FDMA/FDD system, forward and reverse channel uses \_\_\_\_\_ carrier frequencies  
 a) Same  
 b) Different  
 c) Both (a) and (b)  
 d) None of these
- 6) GSM is a \_\_\_\_\_ generation cellular system.  
 a) First  
 b) Second  
 c) Third  
 d) None of these
- 7) What is the bandwidth used in IS-95 CDMA?  
 a) 1.25 MHz  
 b) 1.5 MHz  
 c) 1.75 MHz  
 d) 2 MHz

- 8) Which of the following is/are the main part(s) of basic cellular system?  
a) A mobile Unit  
b) A Base Station  
c) A Mobile Telephone Switching Office  
d) All of the above
- 9) Fading of the received radio signals in a mobile communication environment occurs because of \_\_\_\_\_.  
a) Direct propagation  
b) Multipath Propagation  
c) Bi-path Propagation  
d) None of the above
- 10) In \_\_\_\_\_ Frequency Spectrum is divided into smaller spectra and is allocated to each user.  
a) TDMA  
b) CDMA  
c) FDMA  
d) FGMA
- 11) The antenna which attempts to direct all its energy in a particular direction is called as a \_\_\_\_\_.  
a) Directional Antenna  
b) One to One Antenna  
c) Propagation Antenna  
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- 12) Reflection is?  
a) Propagation mode  
b) Propagation mechanism  
c) Spread spectrum  
d) None of the above
- 13) What is Fraunhofer distance for  $f = 1800$  MHz and largest linear antenna dimension is 0.5?  
a) 1.5 m  
b) 2 m  
c) 3 m  
d) None of these
- 14) The model considered for both direct path and ground reflected propagation path between T-R is \_\_\_\_\_.  
a) Hata model  
b) Two ray model  
c) Free space model  
d) Okumura model



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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Advanced Mobile Communication**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following:** **16**

- 1) Explain frequency reuse technique in cellular system.
- 2) A spectrum of 30 MHz is allocated to a wireless FDD cellular system which uses two 25 KHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (i) four cell reuse, (ii) seven cell reuse (iii) 12 cell reuse.
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**Q.3 Attempt any two of the following.** **12**

- 1) Explain in brief different methods used to improve capacity of cellular system.
- 2) For a given path loss exponent i)  $n = 4$  ii)  $n = 3$  find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal to interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are 6 co-channel cells in the first tier and all of them are at the same distance from the mobile.
- 3) Explain ground reflection or two ray model and prove that path difference  $\Delta = (2 h_t h_r)/d$

**Section – II**

**Q.4 Attempt any three of the following:** **16**

- 1) Explain frequency and channel specification in IS-95 CDMA system.
- 2) Write a short note on GSM system architecture.
- 3) Explain GSM frames in detail.
- 4) Explain mobile call origination sequence in GSM.

**Q.5 Attempt any two of the following.** **12**

- 1) Draw and explain GPRS network architecture in detail.
- 2) Draw 4G/LTE architecture and explain.
- 3) Explain packet and frame format for forward and reverse CDMA IS-95 channels.

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Advanced Mobile Communication**

Day & Date: Wednesday, 22-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) IMT 2000 stands for \_\_\_\_\_.
  - a) International Mobile Telecommunication
  - b) Interim Mobile Telecommunication
  - c) International Mobile Technology
  - d) None of these
- 2) In FDMA/FDD system, forward and reverse channel uses \_\_\_\_\_ carrier frequencies
  - a) Same
  - b) Different
  - c) Both (a) and (b)
  - d) None of these
- 3) GSM is a \_\_\_\_\_ generation cellular system.
  - a) First
  - b) Second
  - c) Third
  - d) None of these
- 4) What is the bandwidth used in IS-95 CDMA?
  - a) 1.25 MHz
  - b) 1.5 MHz
  - c) 1.75 MHz
  - d) 2 MHz
- 5) Which of the following is/are the main part(s) of basic cellular system?
  - a) A mobile Unit
  - b) A Base Station
  - c) A Mobile Telephone Switching Office
  - d) All of the above
- 6) Fading of the received radio signals in a mobile communication environment occurs because of \_\_\_\_\_.
  - a) Direct propagation
  - b) Multipath Propagation
  - c) Bi-path Propagation
  - d) None of the above
- 7) In \_\_\_\_\_ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
  - a) TDMA
  - b) CDMA
  - c) FDMA
  - d) FGMA

- 8) The antenna which attempts to direct all its energy in a particular direction is called as a \_\_\_\_\_.  
a) Directional Antenna                      b) One to One Antenna  
c) Propagation Antenna                    d) Single Direction Antenna
- 9) Reflection is?  
a) Propagation mode                      b) Propagation mechanism  
c) Spread spectrum                      d) None of the above
- 10) What is Fraunhofer distance for  $f = 1800$  MHz and largest linear antenna dimension is 0.5?  
a) 1.5 m                                      b) 2 m  
c) 3 m                                      d) None of these
- 11) The model considered for both direct path and ground reflected propagation path between T-R is \_\_\_\_\_.  
a) Hata model                              b) Two ray model  
c) Free space model                      d) Okumura model
- 12) Modulation technique used in CDMA 2000 is \_\_\_\_\_.  
a) Uplink – QPSK, Downlink – BPSK  
b) Uplink – BPSK, Downlink – QPSK  
c) Uplink – BPSK, Downlink – BPSK  
d) None of the above
- 13) In GSM the uplink frequency band is \_\_\_\_\_.  
a) 890-915 MHz                              b) 935-960 MHz  
c) 890-935 MHz                              d) 917-945 MHz
- 14) An interface which connects a BTS to a BSC is called \_\_\_\_\_ interface.  
a) Channel Interface                      b) Signaling Interface  
c) Abis Interface                              d) None of these

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Advanced Mobile Communication**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following:** **16**

- 1) Explain frequency reuse technique in cellular system.
- 2) A spectrum of 30 MHz is allocated to a wireless FDD cellular system which uses two 25 KHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (i) four cell reuse, (ii) seven cell reuse (iii) 12 cell reuse.
- 3) Explain channel assignment strategies in cellular system
- 4) Find the Fraunhofer distance for an antenna with maximum dimension of 1 m and operating frequency of 900 MHz. If antenna have unity gain calculate the path loss.

**Q.3 Attempt any two of the following.** **12**

- 1) Explain in brief different methods used to improve capacity of cellular system.
- 2) For a given path loss exponent i)  $n = 4$  ii)  $n = 3$  find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal to interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are 6 co-channel cells in the first tier and all of them are at the same distance from the mobile.
- 3) Explain ground reflection or two ray model and prove that path difference  $\Delta = (2 h_t h_r)/d$

**Section – II**

**Q.4 Attempt any three of the following:** **16**

- 1) Explain frequency and channel specification in IS-95 CDMA system.
- 2) Write a short note on GSM system architecture.
- 3) Explain GSM frames in detail.
- 4) Explain mobile call origination sequence in GSM.

**Q.5 Attempt any two of the following.** **12**

- 1) Draw and explain GPRS network architecture in detail.
- 2) Draw 4G/LTE architecture and explain.
- 3) Explain packet and frame format for forward and reverse CDMA IS-95 channels.

<b>Seat No.</b>	
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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Advanced Mobile Communication**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) What is Fraunhofer distance for  $f = 1800$  MHz and largest linear antenna dimension is 0.5?
 

a) 1.5 m	b) 2 m
c) 3 m	d) None of these
- 2) The model considered for both direct path and ground reflected propagation path between T-R is \_\_\_\_\_.
 

a) Hata model	b) Two ray model
c) Free space model	d) Okumura model
- 3) Modulation technique used in CDMA 2000 is \_\_\_\_\_.
 

a) Uplink – QPSK, Downlink – BPSK
b) Uplink – BPSK, Downlink – QPSK
c) Uplink – BPSK, Downlink – BPSK
d) None of the above
- 4) In GSM the uplink frequency band is \_\_\_\_\_.
 

a) 890-915 MHz	b) 935-960 MHz
c) 890-935 MHz	d) 917-945 MHz
- 5) An interface which connects a BTS to a BSC is called \_\_\_\_\_ interface.
 

a) Channel Interface	b) Signaling Interface
c) Abis Interface	d) None of these
- 6) IMT 2000 stands for \_\_\_\_\_.
 

a) International Mobile Telecommunication
b) Interim Mobile Telecommunication
c) International Mobile Technology
d) None of these
- 7) In FDMA/FDD system, forward and reverse channel uses \_\_\_\_\_ carrier frequencies
 

a) Same	b) Different
c) Both (a) and (b)	d) None of these

- 8) GSM is a \_\_\_\_\_ generation cellular system.
- |          |                  |
|----------|------------------|
| a) First | b) Second        |
| c) Third | d) None of these |
- 9) What is the bandwidth used in IS-95 CDMA?
- |             |            |
|-------------|------------|
| a) 1.25 MHz | b) 1.5 MHz |
| c) 1.75 MHz | d) 2 MHz   |
- 10) Which of the following is/are the main part(s) of basic cellular system?
- |  |
|--|
| a) A mobile Unit                       |
| b) A Base Station                      |
| c) A Mobile Telephone Switching Office |
| d) All of the above                    |
- 11) Fading of the received radio signals in a mobile communication environment occurs because of \_\_\_\_\_.
- |                        |                          |
|------------------------|--------------------------|
| a) Direct propagation  | b) Multipath Propagation |
| c) Bi-path Propagation | d) None of the above     |
- 12) In \_\_\_\_\_ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
- |         |         |
|---------|---------|
| a) TDMA | b) CDMA |
| c) FDMA | d) FGMA |
- 13) The antenna which attempts to direct all its energy in a particular direction is called as a \_\_\_\_\_.
- |                        |                             |
|------------------------|-----------------------------|
| a) Directional Antenna | b) One to One Antenna       |
| c) Propagation Antenna | d) Single Direction Antenna |
- 14) Reflection is?
- |                     |                          |
|---------------------|--------------------------|
| a) Propagation mode | b) Propagation mechanism |
| c) Spread spectrum  | d) None of the above     |

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Advanced Mobile Communication**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three of the following:** **16**

- 1) Explain frequency reuse technique in cellular system.
- 2) A spectrum of 30 MHz is allocated to a wireless FDD cellular system which uses two 25 KHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (i) four cell reuse, (ii) seven cell reuse (iii) 12 cell reuse.
- 3) Explain channel assignment strategies in cellular system
- 4) Find the Fraunhofer distance for an antenna with maximum dimension of 1 m and operating frequency of 900 MHz. If antenna have unity gain calculate the path loss.

**Q.3 Attempt any two of the following.** **12**

- 1) Explain in brief different methods used to improve capacity of cellular system.
- 2) For a given path loss exponent i)  $n = 4$  ii)  $n = 3$  find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal to interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are 6 co-channel cells in the first tier and all of them are at the same distance from the mobile.
- 3) Explain ground reflection or two ray model and prove that path difference  $\Delta = (2 h_t h_r)/d$

**Section – II**

**Q.4 Attempt any three of the following:** **16**

- 1) Explain frequency and channel specification in IS-95 CDMA system.
- 2) Write a short note on GSM system architecture.
- 3) Explain GSM frames in detail.
- 4) Explain mobile call origination sequence in GSM.

**Q.5 Attempt any two of the following.** **12**

- 1) Draw and explain GPRS network architecture in detail.
- 2) Draw 4G/LTE architecture and explain.
- 3) Explain packet and frame format for forward and reverse CDMA IS-95 channels.

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Select an appropriate option**

**14**

- 1) In optical fiber, signal is in \_\_\_\_\_ form.
  - a) Light
  - b) Electrical
  - c) RF Waves
  - d) None of above
- 2) N.A. is useful measure of \_\_\_\_\_.
  - a) Light Scattering Ability
  - b) Attenuation
  - c) Dispersion
  - d) Light gathering capability
- 3) SRS (Stimulated Raman Scattering) occurs at high power level.
  - a) True
  - b) False
- 4) Intramodal dispersion is also known as \_\_\_\_\_ dispersion.
  - a) Modal
  - b) Chromatic
  - c) Material
  - d) Waveguide
- 5) A temporary joint-formed between two individual optical fibers in the field is known as a
  - a) Fiber joint
  - b) Fiber splice
  - c) Fiber connector
  - d) Fiber coupler
- 6) To achieve optical amplification the condition  $N_2 > N_1$  is achieved through a process called as \_\_\_\_\_.
  - a) Population Inversion
  - b) Nuclear Radiation
  - c) Variation of diameter of optical fiber
  - d) LASER modulation
- 7) SLD offers \_\_\_\_\_ spectral linewidth.
  - a) broad
  - b) constant
  - c) non linear
  - d) narrow
- 8) Impact ionization phenomenon occur in \_\_\_\_\_.
  - a) p-n photodiode
  - b) Avalanche photodiode
  - c) P-I-N photodiode
  - d) None of the above



- 9) The phototransistor provides internal gain of the photocurrent through \_\_\_\_\_.  
a) Avalanche multiplication  
b) Transistor action  
c) Both a and b  
d) None of these
- 10) LAN network is used for \_\_\_\_\_.  
a) TV broadcasting service                      b) Home facsimile  
c) video phone                                      d) All of the above
- 11) In an optical network, which topologies are used?  
a) Ring    b) Bus  
c) Star    d) All of the above
- 12) The basic performance of WDM system is determined by \_\_\_\_\_.  
a) Insertion loss                                      b) Transmission loss  
c) Noise added in channel                      d) All of the above
- 13) Responsivity unit is  
a) AW    b) A/W  
c)  $AW^2$     d) W
- 14) In the intrinsic absorption process the energy of the incident photons should be \_\_\_\_\_ to the band gap energy  $E_g$  of the material used to fabricate the photodetector.  
a) Lesser than or equal  
b) Greater than or equal  
c) Equal  
d) Not equal

Seat No.	
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Set **P**

**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- 1) Explain the block diagram of optical communication system.
- 2) With ray theory of light, explain the basic working principle of Optical Fiber.
- 3) Explain the scattering losses in Fiber.
- 4) An Optical Fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59. Determine
  - a) The acceptance angle for the Fiber in water which has a refractive index of 1.33.
  - b) The critical angle at the core-cladding interface.
- 5) Write the various types of LEDs & explain any one.

**Q.3 Solve any two of the following.** **12**

- 1) Explain LASER characteristics.
- 2) Explain optical fiber alignment & joint loss.
- 3) A long single-mode Optical Fiber has an attenuation of  $0.5 \text{ dBkm}^{-1}$  when operating at a wavelength of  $1.3 \mu\text{m}$ . The Fiber core diameter is  $6 \mu\text{m}$  and the LASER source bandwidth is 600 MHz. Compare the threshold Optical powers for stimulated Brillouin and Raman scattering within the Fiber at the wavelength specified.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- 1) Explain in detail the concept of phototransistor.
- 2) Explain the basic working principle of optical detector.
- 3) Explain the concept of FDDI.
- 4) What are the requirements of the Optical detectors?
- 5) Explain the optical transmitter design in detail.

**Q.5 Solve any two of the following.** **12**

- 1) A photodiode has a quantum efficiency of 65% when photons of energy  $1.5 \times 10^{-19} \text{ J}$  are incident upon it.
  - a) At what wavelength is the photodiode operating?
  - b) Calculate the incident Optical power required to obtain a photocurrent of  $2.5 \mu\text{A}$  when the photodiode is operating as described above.
- 2) Write short note on SONET/SDH.
- 3) Explain optical link design.

<b>Seat No.</b>	
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- 8) In optical fiber, signal is in \_\_\_\_\_ form.
- a) Light
  - b) Electrical
  - c) RF Waves
  - d) None of above
- 9) N.A. is useful measure of\_\_\_\_\_.
- a) Light Scattering Ability
  - b) Attenuation
  - c) Dispersion
  - d) Light gathering capability
- 10) SRS (Stimulated Raman Scattering) occurs at high power level.
- a) True
  - b) False
- 11) Intramodal dispersion is also known as\_\_\_\_\_dispersion.
- a) Modal
  - b) Chromatic
  - c) Material
  - d) Waveguide
- 12) A temporary joint-formed between two individual optical fibers in the field is known as a
- a) Fiber joint
  - b) Fiber splice
  - c) Fiber connector
  - d) Fiber coupler
- 13) To achieve optical amplification the condition  $N_2 > N_1$  is achieved through a process called as\_\_\_\_\_.
- a) Population Inversion
  - b) Nuclear Radiation
  - c) Variation of diameter of optical fiber
  - d) LASER modulation
- 14) SLD offers\_\_\_\_\_spectral linewidth.
- a) broad
  - b) constant
  - c) non linear
  - d) narrow

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- 1) Explain the block diagram of optical communication system.
- 2) With ray theory of light, explain the basic working principle of Optical Fiber.
- 3) Explain the scattering losses in Fiber.
- 4) An Optical Fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59. Determine
  - a) The acceptance angle for the Fiber in water which has a refractive index of 1.33.
  - b) The critical angle at the core-cladding interface.
- 5) Write the various types of LEDs & explain any one.

**Q.3 Solve any two of the following.** **12**

- 1) Explain LASER characteristics.
- 2) Explain optical fiber alignment & joint loss.
- 3) A long single-mode Optical Fiber has an attenuation of  $0.5 \text{ dBkm}^{-1}$  when operating at a wavelength of  $1.3 \mu\text{m}$ . The Fiber core diameter is  $6 \mu\text{m}$  and the LASER source bandwidth is 600 MHz. Compare the threshold Optical powers for stimulated Brillouin and Raman scattering within the Fiber at the wavelength specified.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- 1) Explain in detail the concept of phototransistor.
- 2) Explain the basic working principle of optical detector.
- 3) Explain the concept of FDDI.
- 4) What are the requirements of the Optical detectors?
- 5) Explain the optical transmitter design in detail.

**Q.5 Solve any two of the following.** **12**

- 1) A photodiode has a quantum efficiency of 65% when photons of energy  $1.5 \times 10^{-19} \text{ J}$  are incident upon it.
  - a) At what wavelength is the photodiode operating?
  - b) Calculate the incident Optical power required to obtain a photocurrent of  $2.5 \mu\text{A}$  when the photodiode is operating as described above.
- 2) Write short note on SONET/SDH.
- 3) Explain optical link design.

Seat No.	
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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Select an appropriate option**

**14**

- 1) In an optical network, which topologies are used?
  - a) Ring
  - b) Bus
  - c) Star
  - d) All of the above
- 2) The basic performance of WDM system is determined by \_\_\_\_\_.
  - a) Insertion loss
  - b) Transmission loss
  - c) Noise added in channel
  - d) All of the above
- 3) Responsivity unit is
  - a) AW
  - b) A/W
  - c) AW<sup>2</sup>
  - d) W
- 4) In the intrinsic absorption process the energy of the incident photons should be \_\_\_\_\_ to the band gap energy  $E_g$  of the material used to fabricate the photodetector.
  - a) Lesser than or equal
  - b) Greater than or equal
  - c) Equal
  - d) Not equal
- 5) In optical fiber, signal is in \_\_\_\_\_ form.
  - a) Light
  - b) Electrical
  - c) RF Waves
  - d) None of above
- 6) N.A. is useful measure of \_\_\_\_\_.
  - a) Light Scattering Ability
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- 9) A temporary joint-formed between two individual optical fibers in the field is known as a
- a) Fiber joint
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- 10) To achieve optical amplification the condition  $N_2 > N_1$  is achieved through a process called as\_\_\_\_\_.
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- 11) SLD offers\_\_\_\_\_spectral linewidth.
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- a) p-n photodiode
  - b) Avalanche photodiode
  - c) P-I-N photodiode
  - d) None of the above
- 13) The phototransistor provides internal gain of the photocurrent through\_\_\_\_\_.
- a) Avalanche multiplication
  - b) Transistor action
  - c) Both a and b
  - d) None of these
- 14) LAN network is used for\_\_\_\_\_.
- a) TV broadcasting service
  - b) Home facsimile
  - c) video phone
  - d) All of the above

Seat No.	
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Set	R
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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Solve any four of the following.** **16**

- 1) Explain the block diagram of optical communication system.
- 2) With ray theory of light, explain the basic working principle of Optical Fiber.
- 3) Explain the scattering losses in Fiber.
- 4) An Optical Fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59. Determine
  - a) The acceptance angle for the Fiber in water which has a refractive index of 1.33.
  - b) The critical angle at the core-cladding interface.
- 5) Write the various types of LEDs & explain any one.

**Q.3 Solve any two of the following.** **12**

- 1) Explain LASER characteristics.
- 2) Explain optical fiber alignment & joint loss.
- 3) A long single-mode Optical Fiber has an attenuation of  $0.5 \text{ dBkm}^{-1}$  when operating at a wavelength of  $1.3 \mu\text{m}$ . The Fiber core diameter is  $6 \mu\text{m}$  and the LASER source bandwidth is 600 MHz. Compare the threshold Optical powers for stimulated Brillouin and Raman scattering within the Fiber at the wavelength specified.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- 1) Explain in detail the concept of phototransistor.
- 2) Explain the basic working principle of optical detector.
- 3) Explain the concept of FDDI.
- 4) What are the requirements of the Optical detectors?
- 5) Explain the optical transmitter design in detail.

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- 1) A photodiode has a quantum efficiency of 65% when photons of energy  $1.5 \times 10^{-19} \text{ J}$  are incident upon it.
  - a) At what wavelength is the photodiode operating?
  - b) Calculate the incident Optical power required to obtain a photocurrent of  $2.5 \mu\text{A}$  when the photodiode is operating as described above.
- 2) Write short note on SONET/SDH.
- 3) Explain optical link design.



Seat No.	
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Set **S**

**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Select an appropriate option**

**14**

- 1) To achieve optical amplification the condition  $N_2 > N_1$  is achieved through a process called as \_\_\_\_\_.
  - a) Population Inversion
  - b) Nuclear Radiation
  - c) Variation of diameter of optical fiber
  - d) LASER modulation
- 2) SLD offers \_\_\_\_\_ spectral linewidth.
  - a) broad
  - b) constant
  - c) non linear
  - d) narrow
- 3) Impact ionization phenomenon occur in \_\_\_\_\_.
  - a) p-n photodiode
  - b) Avalanche photodiode
  - c) P-I-N photodiode
  - d) None of the above
- 4) The phototransistor provides internal gain of the photocurrent through \_\_\_\_\_.
  - a) Avalanche multiplication
  - b) Transistor action
  - c) Both a and b
  - d) None of these
- 5) LAN network is used for \_\_\_\_\_.
  - a) TV broadcasting service
  - b) Home facsimile
  - c) video phone
  - d) All of the above
- 6) In an optical network, which topologies are used?
  - a) Ring
  - b) Bus
  - c) Star
  - d) All of the above
- 7) The basic performance of WDM system is determined by \_\_\_\_\_.
  - a) Insertion loss
  - b) Transmission loss
  - c) Noise added in channel
  - d) All of the above
- 8) Responsivity unit is
  - a) AW
  - b) A/W
  - c)  $AW^2$
  - d) W

- 9) In the intrinsic absorption process the energy of the incident photons should be \_\_\_\_\_ to the band gap energy  $E_g$  of the material used to fabricate the photodetector.
- a) Lesser than or equal
  - b) Greater than or equal
  - c) Equal
  - d) Not equal
- 10) In optical fiber, signal is in \_\_\_\_\_ form.
- a) Light
  - b) Electrical
  - c) RF Waves
  - d) None of above
- 11) N.A. is useful measure of \_\_\_\_\_.
- a) Light Scattering Ability
  - b) Attenuation
  - c) Dispersion
  - d) Light gathering capability
- 12) SRS (Stimulated Raman Scattering) occurs at high power level.
- a) True
  - b) False
- 13) Intramodal dispersion is also known as \_\_\_\_\_ dispersion.
- a) Modal
  - b) Chromatic
  - c) Material
  - d) Waveguide
- 14) A temporary joint-formed between two individual optical fibers in the field is known as a
- a) Fiber joint
  - b) Fiber splice
  - c) Fiber connector
  - d) Fiber coupler

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- 1) Explain the block diagram of optical communication system.
- 2) With ray theory of light, explain the basic working principle of Optical Fiber.
- 3) Explain the scattering losses in Fiber.
- 4) An Optical Fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59. Determine
  - a) The acceptance angle for the Fiber in water which has a refractive index of 1.33.
  - b) The critical angle at the core-cladding interface.
- 5) Write the various types of LEDs & explain any one.

**Q.3 Solve any two of the following.** **12**

- 1) Explain LASER characteristics.
- 2) Explain optical fiber alignment & joint loss.
- 3) A long single-mode Optical Fiber has an attenuation of  $0.5 \text{ dBkm}^{-1}$  when operating at a wavelength of  $1.3 \mu\text{m}$ . The Fiber core diameter is  $6 \mu\text{m}$  and the LASER source bandwidth is 600 MHz. Compare the threshold Optical powers for stimulated Brillouin and Raman scattering within the Fiber at the wavelength specified.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- 1) Explain in detail the concept of phototransistor.
- 2) Explain the basic working principle of optical detector.
- 3) Explain the concept of FDDI.
- 4) What are the requirements of the Optical detectors?
- 5) Explain the optical transmitter design in detail.

**Q.5 Solve any two of the following.** **12**

- 1) A photodiode has a quantum efficiency of 65% when photons of energy  $1.5 \times 10^{-19} \text{ J}$  are incident upon it.
  - a) At what wavelength is the photodiode operating?
  - b) Calculate the incident Optical power required to obtain a photocurrent of  $2.5 \mu\text{A}$  when the photodiode is operating as described above.
- 2) Write short note on SONET/SDH.
- 3) Explain optical link design.

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct answer.**

**14**

- 1) \_\_\_\_\_ is the insensitivity of the sensor in a specific range of input signals.
  - a) Dead band
  - b) Repeatability
  - c) Non linearity
  - d) None of the above
- 2) Piezo- electric transducer has a \_\_\_\_\_.
  - a) High sensitivity
  - b) Low sensitivity
  - c) Both A and B
  - d) None of the above
- 3) The unit of magnetic flux density is \_\_\_\_\_.
  - a) Weber
  - b) Weber/m
  - c) Tesla
  - d) Tesla/second
- 4) The fundamental property of magnetism is that \_\_\_\_\_ electric charge.
  - a) Moving
  - b) Steady
  - c) both a & b
  - d) None of the above
- 5) Which of the following is magnetic sensor resistor?
  - a) Capacitive sensor
  - b) Semiconductor sensor
  - c) Resistive Sensor
  - d) Thermal sensor
- 6) In current generator, electric current is independent on \_\_\_\_\_.
  - a) Matching impedance
  - b) load impedance
  - c) terminal impedance
  - d) None of the above
- 7) Which of the following is dynamic characteristics of sensor
  - a) Hysteresis
  - b) Accuracy
  - c) Linearity
  - d) None of the above

- 8) SI unit of pressure is\_\_\_\_\_.  
a) Mole  
b) Pascal  
c) Candela  
d) Kelvin
- 9) Which of the following is the humidity sensor?  
a) Gyroscope  
b) Hygrometer  
c) Sundial  
d) Proximity
- 10) Pressure Sensor generates output in \_\_\_\_\_ form.  
a) Digital  
b) Analog  
c) Both a & b  
d) Heat
- 11) Function of Electrical actuator is\_\_\_\_\_.  
a) Converts electrical energy into mechanical torque  
b) Converts mechanical torque into electrical energy  
c) Converts mechanical energy into mechanical torque  
d) None of the above
- 12) Output generated by piezo-electric sensor is\_\_\_\_\_.  
a) Mechanical  
b) Electrical Charge  
c) Chemical  
d) All of the above
- 13) Which of the following are examples of Level Sensor?  
a) Ultrasonic  
b) Capacitance  
c) Both a & b  
d) All of the above
- 14) Relative Humidity is the function of\_\_\_\_\_.  
a) Ambient temperature  
b) Water Vapor Pressure  
c) Both a & b  
d) Dryness

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- 1) With the help of neat sketch explain Hall Effect sensor.
- 2) Explain working of Instrumentation Amplifier.
- 3) Describe thermal conduction of heat transfer.
- 4) Explain Primary & Secondary cells of battery.
- 5) Define Absolute & Relative Sensor with example.

**Q.3 Attempt any Two.** **12**

- 1) Describe dual slope converter & successive approximation converter with necessary diagrams.
- 2) Explain Following Characteristics of Sensor.  
a) Hysteresis b) Dead band c) span
- 3) Explain types of sensor element dynamic models

**Section – II**

**Q.4 Attempt any Four.** **16**

- 1) With the help of neat sketch explain working of photo transistor.
- 2) Describe Selection criteria of actuators.
- 3) Compare Hydraulic & Pneumatic actuators.
- 4) Explain following terms.  
a) Velocity b) Acceleration
- 5) With the help of neat sketch explain piezo-resistive tactile sensor. Also write application of it.

**Q.5 Attempt any Two.** **12**

- 1) Explain following sensor.  
a) Thermocouple b) Thermistor
- 2) Write short note on nanotechnology.
- 3) Explain Working of Electromagnetic Actuator with neat sketch.

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct answer.**

**14**

- 1) SI unit of pressure is \_\_\_\_\_.
  - a) Mole
  - b) Pascal
  - c) Candela
  - d) Kelvin
- 2) Which of the following is the humidity sensor?
  - a) Gyroscope
  - b) Hygrometer
  - c) Sundial
  - d) Proximity
- 3) Pressure Sensor generates output in \_\_\_\_\_ form.
  - a) Digital
  - b) Analog
  - c) Both a & b
  - d) Heat
- 4) Function of Electrical actuator is \_\_\_\_\_.
  - a) Converts electrical energy into mechanical torque
  - b) Converts mechanical torque into electrical energy
  - c) Converts mechanical energy into mechanical torque
  - d) None of the above
- 5) Output generated by piezo-electric sensor is \_\_\_\_\_.
  - a) Mechanical
  - b) Electrical Charge
  - c) Chemical
  - d) All of the above
- 6) Which of the following are examples of Level Sensor?
  - a) Ultrasonic
  - b) Capacitance
  - c) Both a & b
  - d) All of the above
- 7) Relative Humidity is the function of \_\_\_\_\_.
  - a) Ambient temperature
  - b) Water Vapor Pressure
  - c) Both a & b
  - d) Dryness

- 8) \_\_\_\_\_ is the insensitivity of the sensor in a specific range of input signals.
- a) Dead band
  - b) Repeatability
  - c) Non linearity
  - d) None of the above
- 9) Piezo- electric transducer has a\_\_\_\_\_.
- a) High sensitivity
  - b) Low sensitivity
  - c) Both A and B
  - d) None of the above
- 10) The unit of magnetic flux density is\_\_\_\_\_.
- a) Weber
  - b) Weber/m
  - c) Tesla
  - d) Tesla/second
- 11) The fundamental property of magnetism is that \_\_\_\_\_ electric charge.
- a) Moving
  - b) Steady
  - c) both a & b
  - d) None of the above
- 12) Which of the following is magnetic sensor resistor?
- a) Capacitive sensor
  - b) Semiconductor sensor
  - c) Resistive Sensor
  - d) Thermal sensor
- 13) In current generator, electric current is independent on\_\_\_\_\_.
- a) Matching impedance
  - b) load impedance
  - c) terminal impedance
  - d) None of the above
- 14) Which of the following is dynamic characteristics of sensor
- a) Hysteresis
  - b) Accuracy
  - c) Linearity
  - d) None of the above



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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- 1) With the help of neat sketch explain Hall Effect sensor.
- 2) Explain working of Instrumentation Amplifier.
- 3) Describe thermal conduction of heat transfer.
- 4) Explain Primary & Secondary cells of battery.
- 5) Define Absolute & Relative Sensor with example.

**Q.3 Attempt any Two.** **12**

- 1) Describe dual slope converter & successive approximation converter with necessary diagrams.
- 2) Explain Following Characteristics of Sensor.  
 a) Hysteresis   b) Dead band   c) span
- 3) Explain types of sensor element dynamic models

**Section – II**

**Q.4 Attempt any Four.** **16**

- 1) With the help of neat sketch explain working of photo transistor.
- 2) Describe Selection criteria of actuators.
- 3) Compare Hydraulic & Pneumatic actuators.
- 4) Explain following terms.  
 a) Velocity   b) Acceleration
- 5) With the help of neat sketch explain piezo-resistive tactile sensor. Also write application of it.

**Q.5 Attempt any Two.** **12**

- 1) Explain following sensor.  
 a) Thermocouple   b) Thermistor
- 2) Write short note on nanotechnology.
- 3) Explain Working of Electromagnetic Actuator with neat sketch.

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct answer.**

**14**

- 1) Function of Electrical actuator is\_\_\_\_\_.
  - a) Converts electrical energy into mechanical torque
  - b) Converts mechanical torque into electrical energy
  - c) Converts mechanical energy into mechanical torque
  - d) None of the above
- 2) Output generated by piezo-electric sensor is\_\_\_\_\_.
  - a) Mechanical
  - b) Electrical Charge
  - c) Chemical
  - d) All of the above
- 3) Which of the following are examples of Level Sensor?
  - a) Ultrasonic
  - b) Capacitance
  - c) Both a & b
  - d) All of the above
- 4) Relative Humidity is the function of\_\_\_\_\_.
  - a) Ambient temperature
  - b) Water Vapor Pressure
  - c) Both a & b
  - d) Dryness
- 5) \_\_\_\_\_is the insensitivity of the sensor in a specific range of input signals.
  - a) Dead band
  - b) Repeatability
  - c) Non linearity
  - d) None of the above
- 6) Piezo- electric transducer has a\_\_\_\_\_.
  - a) High sensitivity
  - b) Low sensitivity
  - c) Both A and B
  - d) None of the above

- 7) The unit of magnetic flux density is \_\_\_\_\_.  
a) Weber  
b) Weber/m  
c) Tesla  
d) Tesla/second
- 8) The fundamental property of magnetism is that \_\_\_\_\_ electric charge.  
a) Moving  
b) Steady  
c) both a & b  
d) None of the above
- 9) Which of the following is magnetic sensor resistor?  
a) Capacitive sensor  
b) Semiconductor sensor  
c) Resistive Sensor  
d) Thermal sensor
- 10) In current generator, electric current is independent on \_\_\_\_\_.  
a) Matching impedance  
b) load impedance  
c) terminal impedance  
d) None of the above
- 11) Which of the following is dynamic characteristics of sensor  
a) Hysteresis  
b) Accuracy  
c) Linearity  
d) None of the above
- 12) SI unit of pressure is \_\_\_\_\_.  
a) Mole  
b) Pascal  
c) Candela  
d) Kelvin
- 13) Which of the following is the humidity sensor?  
a) Gyroscope  
b) Hygrometer  
c) Sundial  
d) Proximity
- 14) Pressure Sensor generates output in \_\_\_\_\_ form.  
a) Digital  
b) Analog  
c) Both a & b  
d) Heat

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- 1) With the help of neat sketch explain Hall Effect sensor.
- 2) Explain working of Instrumentation Amplifier.
- 3) Describe thermal conduction of heat transfer.
- 4) Explain Primary & Secondary cells of battery.
- 5) Define Absolute & Relative Sensor with example.

**Q.3 Attempt any Two.** **12**

- 1) Describe dual slope converter & successive approximation converter with necessary diagrams.
- 2) Explain Following Characteristics of Sensor.  
a) Hysteresis b) Dead band c) span
- 3) Explain types of sensor element dynamic models

**Section – II**

**Q.4 Attempt any Four.** **16**

- 1) With the help of neat sketch explain working of photo transistor.
- 2) Describe Selection criteria of actuators.
- 3) Compare Hydraulic & Pneumatic actuators.
- 4) Explain following terms.  
c) Velocity b) Acceleration
- 5) With the help of neat sketch explain piezo-resistive tactile sensor. Also write application of it.

**Q.5 Attempt any Two.** **12**

- 1) Explain following sensor.  
c) Thermocouple b) Thermistor
- 2) Write short note on nanotechnology.
- 3) Explain Working of Electromagnetic Actuator with neat sketch.

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct answer.**

**14**

- 1) In current generator, electric current is independent on\_\_\_\_\_.  
 a) Matching impedance  
 b) load impedance  
 c) terminal impedance  
 d) None of the above
- 2) Which of the following is dynamic characteristics of sensor  
 a) Hysteresis  
 b) Accuracy  
 c) Linearity  
 d) None of the above
- 3) SI unit of pressure is\_\_\_\_\_.  
 a) Mole  
 b) Pascal  
 c) Candela  
 d) Kelvin
- 4) Which of the following is the humidity sensor?  
 a) Gyroscope  
 b) Hygrometer  
 c) Sundial  
 d) Proximity
- 5) Pressure Sensor generates output in \_\_\_\_\_ form.  
 a) Digital  
 b) Analog  
 c) Both a & b  
 d) Heat
- 6) Function of Electrical actuator is\_\_\_\_\_.  
 a) Converts electrical energy into mechanical torque  
 b) Converts mechanical torque into electrical energy  
 c) Converts mechanical energy into mechanical torque  
 d) None of the above
- 7) Output generated by piezo-electric sensor is\_\_\_\_\_.  
 a) Mechanical  
 b) Electrical Charge  
 c) Chemical  
 d) All of the above

- 8) Which of the following are examples of Level Sensor?
- a) Ultrasonic
  - b) Capacitance
  - c) Both a & b
  - d) All of the above
- 9) Relative Humidity is the function of\_\_\_\_\_.
- a) Ambient temperature
  - b) Water Vapor Pressure
  - c) Both a & b
  - d) Dryness
- 10) \_\_\_\_\_is the insensitivity of the sensor in a specific range of input signals.
- a) Dead band
  - b) Repeatability
  - c) Non linearity
  - d) None of the above
- 11) Piezo- electric transducer has a\_\_\_\_\_.
- a) High sensitivity
  - b) Low sensitivity
  - c) Both A and B
  - d) None of the above
- 12) The unit of magnetic flux density is\_\_\_\_\_.
- a) Weber
  - b) Weber/m
  - c) Tesla
  - d) Tesla/second
- 13) The fundamental property of magnetism is that \_\_\_\_\_electric charge.
- a) Moving
  - b) Steady
  - c) both a & b
  - d) None of the above
- 14) Which of the following is magnetic sensor resistor?
- a) Capacitive sensor
  - b) Semiconductor sensor
  - c) Resistive Sensor
  - d) Thermal sensor

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any Four.** **16**

- 1) With the help of neat sketch explain Hall Effect sensor.
- 2) Explain working of Instrumentation Amplifier.
- 3) Describe thermal conduction of heat transfer.
- 4) Explain Primary & Secondary cells of battery.
- 5) Define Absolute & Relative Sensor with example.

**Q.3 Attempt any Two.** **12**

- 1) Describe dual slope converter & successive approximation converter with necessary diagrams.
- 2) Explain Following Characteristics of Sensor.  
a) Hysteresis   b) Dead band   c) span
- 3) Explain types of sensor element dynamic models

**Section – II**

**Q.4 Attempt any Four.** **16**

- 1) With the help of neat sketch explain working of photo transistor.
- 2) Describe Selection criteria of actuators.
- 3) Compare Hydraulic & Pneumatic actuators.
- 4) Explain following terms.  
d) Velocity   b) Acceleration
- 5) With the help of neat sketch explain piezo-resistive tactile sensor. Also write application of it.

**Q.5 Attempt any Two.** **12**

- 1) Explain following sensor.  
d) Thermocouple   b) Thermistor
- 2) Write short note on nanotechnology.
- 3) Explain Working of Electromagnetic Actuator with neat sketch.

<b>Seat No.</b>	
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computer Organization**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.** **10**

- 1) The contents of the program counter is the \_\_\_\_\_ of the instruction to be run.
 

a) Data	b) Address
c) Counter	d) None of these
- 2) In the case of, Zero-address instruction method the operands are stored in \_\_\_\_\_.
 

a) Cache	b) Push down stack
c) Registers	d) Accumulators
- 3) Which unit acts as the brain of the computer which control other peripherals and interfaces:
 

a) Memory unit	b) Cache unit
c) Timing and control unit	d) None of the above
- 4) A collection of wires that connects several devices or computer parts is called \_\_\_\_\_.
 

a) link wire	b) bus
c) bidirectional wire	d) cable
- 5) Which unit works as an interface between the processor and all the memories on chip or off- chip: \_\_\_\_\_.
 

a) Timing unit	b) Control unit
c) Memory control unit	d) All of these
- 6) Cache memory is located between main memory and \_\_\_\_\_.
 

a) CPU	b) Memory
c) Both A and B	d) None of these
- 7) An instruction pipeline can be implemented by means of \_\_\_\_\_.
 

a) LIFO buffer	b) FIFO buffer
c) Sequential memory	d) None of the above



- 8) A microprogram sequencer \_\_\_\_\_.
  - a) generates the address of next micro instruction to be executed.
  - b) generates the control signals to execute a microinstruction.
  - c) sequentially averages all microinstructions in the control memory
  - d) enables the efficient handling of a micro program subroutine
- 9) Cache memory works on the principle of \_\_\_\_\_.
  - a) Locality of data
  - b) Locality of memory
  - c) Locality of reference
  - d) Locality of reference & memory
- 10) Which of the following data transfer mode is relatively fast?
  - a) DMA
  - b) Interrupt initiated I/O
  - c) Programmed I/O
  - d) Isolated I/O

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computer Organization**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 012:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FOUR questions from Q.No.2.  
2) Figures to the right indicates full marks

**Q.2 Attempt any FOUR.**

**40**

- a) Describe the Basic Computer Organization.
- b) Explain the importance of different addressing modes in computer architecture.
- c) Describe how microinstructions are arranged in control memory and how they are interpreted.
- d) Explain basic concept of virtual memory technique.
- e) Describe input-output-processor (IOP) Organization in detail.

**Seat  
No.**

Set Q

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

### MCQ/Objective Type Questions

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

10

- 1) Cache memory is located between main memory and \_\_\_\_\_.  
a) CPU                                      b) Memory  
c) Both A and B                          d) None of these
- 2) An instruction pipeline can be implemented by means of \_\_\_\_\_.  
a) LIFO buffer                              b) FIFO buffer  
c) Sequential memory                    d) None of the above
- 3) A microprogram sequencer \_\_\_\_\_.  
a) generates the address of next micro instruction to be executed.  
b) generates the control signals to execute a microinstruction.  
c) sequentially averages all microinstructions in the control memory  
d) enables the efficient handling of a micro program subroutine
- 4) Cache memory works on the principle of \_\_\_\_\_.  
a) Locality of data                        b) Locality of memory  
c) Locality of reference                  d) Locality of reference & memory
- 5) Which of the following data transfer mode is relatively fast?  
a) DMA                                        b) Interrupt initiated I/O  
c) Programmed I/O                        d) Isolated I/O
- 6) The contents of the program counter is the \_\_\_\_\_ of the instruction to be run.  
a) Data                                        b) Address  
c) Counter                                    d) None of these
- 7) In the case of, Zero-address instruction method the operands are stored in \_\_\_\_\_.  
a) Cache                                        b) Push down stack  
c) Registers                                   d) Accumulators
- 8) Which unit acts as the brain of the computer which control other peripherals and interfaces:  
a) Memory unit                              b) Cache unit  
c) Timing and control unit              d) None of the above

- 9)** A collection of wires that connects several devices or computer parts is called \_\_\_\_\_.  
a) link wire                                      b) bus  
c) bidirectional wire                          d) cable
- 10)** Which unit works as an interface between the processor and all the memories on chip or off- chip: \_\_\_\_\_.  
a) Timing unit                                    b) Control unit  
c) Memory control unit                        d) All of these

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computer Organization**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 012:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FOUR questions from Q.No.2.  
2) Figures to the right indicates full marks

**Q.2 Attempt any FOUR.**

**40**

- a) Describe the Basic Computer Organization.
- b) Explain the importance of different addressing modes in computer architecture.
- c) Describe how microinstructions are arranged in control memory and how they are interpreted.
- d) Explain basic concept of virtual memory technique.
- e) Describe input-output-processor (IOP) Organization in detail.

Set	R
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- 9)** An instruction pipeline can be implemented by means of \_\_\_\_\_.  
a) LIFO buffer                                      b) FIFO buffer  
c) Sequential memory                            d) None of the above
- 10)** A microprogram sequencer \_\_\_\_\_.  
a) generates the address of next micro instruction to be executed.  
b) generates the control signals to execute a microinstruction.  
c) sequentially averages all microinstructions in the control memory  
d) enables the efficient handling of a micro program subroutine

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computer Organization**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 012:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FOUR questions from Q.No.2.  
2) Figures to the right indicates full marks

**Q.2 Attempt any FOUR.**

**40**

- a) Describe the Basic Computer Organization.
- b) Explain the importance of different addressing modes in computer architecture.
- c) Describe how microinstructions are arranged in control memory and how they are interpreted.
- d) Explain basic concept of virtual memory technique.
- e) Describe input-output-processor (IOP) Organization in detail.



Seat No.	
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Set **S**

**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computer Organization**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which unit acts as the brain of the computer which control other peripherals and interfaces:
 

a) Memory unit	b) Cache unit
c) Timing and control unit	d) None of the above
- 2) A collection of wires that connects several devices or computer parts is called \_\_\_\_\_.
 

a) link wire	b) bus
c) bidirectional wire	d) cable
- 3) Which unit works as an interface between the processor and all the memories on chip or off- chip: \_\_\_\_\_.
 

a) Timing unit	b) Control unit
c) Memory control unit	d) All of these
- 4) Cache memory is located between main memory and \_\_\_\_\_.
 

a) CPU	b) Memory
c) Both A and B	d) None of these
- 5) An instruction pipeline can be implemented by means of \_\_\_\_\_.
 

a) LIFO buffer	b) FIFO buffer
c) Sequential memory	d) None of the above
- 6) A microprogram sequencer \_\_\_\_\_.
 

a) generates the address of next micro instruction to be executed.
b) generates the control signals to execute a microinstruction.
c) sequentially averages all microinstructions in the control memory
d) enables the efficient handling of a micro program subroutine
- 7) Cache memory works on the principle of \_\_\_\_\_.
 

a) Locality of data	b) Locality of memory
c) Locality of reference	d) Locality of reference & memory
- 8) Which of the following data transfer mode is relatively fast?
 

a) DMA	b) Interrupt initiated I/O
c) Programmed I/O	d) Isolated I/O

- 9) The contents of the program counter is the \_\_\_\_\_ of the instruction to be run.
- |            |                  |
|------------|------------------|
| a) Data    | b) Address       |
| c) Counter | d) None of these |
- 10) In the case of, Zero-address instruction method the operands are stored in \_\_\_\_\_.
- |              |                    |
|--------------|--------------------|
| a) Cache     | b) Push down stack |
| c) Registers | d) Accumulators    |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech.) (Semester-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computer Organization**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 012:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FOUR questions from Q.No.2.  
2) Figures to the right indicates full marks

**Q.2 Attempt any FOUR.**

**40**

- a) Describe the Basic Computer Organization.
- b) Explain the importance of different addressing modes in computer architecture.
- c) Describe how microinstructions are arranged in control memory and how they are interpreted.
- d) Explain basic concept of virtual memory technique.
- e) Describe input-output-processor (IOP) Organization in detail.

<b>Seat No.</b>	
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Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 10

10

- Page 1 of 12

- 9)** In artificial neural network, interconnected processing elements are termed as \_\_\_\_.
- a) Weights                                      b) Nodes or neurons  
c) Axon    d) Soma
- 10)** Which of the following is termed exploratory learning?
- a) Active learning                              b) Supervised learning  
c) Reinforcement learning                    d) Unsupervised learning

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMUNICATION ENGINEERING**  
**Soft Computing**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**SECTION – I**

**Q.2 Attempt any FOUR.** **20**

- a) Define soft computing Explain it in detail.
- b) Write differences between soft computing and hard computing.
- c) Explain different operations in fuzzy sets.
- d) Write applications of fuzzy sets.
- e) Explain different defuzzification methods.

**SECTION – II**

**Q.3 Attempt any FOUR.** **20**

- a) Explain the Characteristics of Artificial Neural Network.
- b) Explain different activation function.
- c) Write application of Artificial Neural Network.
- d) Explain the concept of Biological Neurons.
- e) Explain Unsupervised Learning in details.

Seat No.	
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Set Q
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Soft Computing**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which of the following is associated with fuzzy logic?
  - a) Crisp set logic
  - b) Many-valued logic
  - c) Two-valued logic
  - d) Binary set logic
- 2) How many types of random variables are there in Fuzzy logic?
  - a) 4
  - b) 3
  - c) 2
  - d) 1
- 3) Which of the following fuzzy operators are utilized in fuzzy set theory?
  - a) AND
  - b) OR
  - c) NOT
  - d) ALL
- 4) In artificial neural network, interconnected processing elements are termed as \_\_\_\_\_.
  - a) Weights
  - b) Nodes or neurons
  - c) Axon
  - d) Soma
- 5) Which of the following is termed exploratory learning?
  - a) Active learning
  - b) Supervised learning
  - c) Reinforcement learning
  - d) Unsupervised learning
- 6) The number of nodes in the input layer is 10 and the hidden layer is 5. The maximum number of connections from the input layer to the hidden layer are \_\_\_\_\_.
  - a) 50
  - b) Less than 50
  - c) More than 50
  - d) It is an arbitrary value
- 7) Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of n classes ( $p_1, p_2, \dots, p_n$ ) such that sum of p over all n equals to 1?
  - a) Softmax
  - b) ReLu
  - c) Sigmoid
  - d) Tanh
- 8) In the neural network, every parameter can have their different learning rate \_\_\_\_\_.
  - a) True
  - b) False
  - c) Can't say
  - d) None of this

- 9)** IN Neural Network The input from Input layer is then feed into the \_\_\_\_.
- |                 |                  |
|-----------------|------------------|
| a) Input layer  | b) Output layer  |
| c) Hidden layer | d) None of these |
- 10)** The rate at which cost changes with respect to weight or bias is called \_\_\_\_.
- |                   |             |
|-------------------|-------------|
| a) Derivative     | b) Gradient |
| c) Rate of Change | d) Loss     |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMUNICATION ENGINEERING**  
**Soft Computing**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**SECTION – I**

- Q.2 Attempt any FOUR.** **20**
- a) Define soft computing Explain it in detail.
  - b) Write differences between soft computing and hard computing.
  - c) Explain different operations in fuzzy sets.
  - d) Write applications of fuzzy sets.
  - e) Explain different defuzzification methods.

**SECTION – II**

- Q.3 Attempt any FOUR.** **20**
- a) Explain the Characteristics of Artificial Neural Network.
  - b) Explain different activation function.
  - c) Write application of Artificial Neural Network.
  - d) Explain the concept of Biological Neurons.
  - e) Explain Unsupervised Learning in details.

<b>Seat No.</b>	
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- 9)** How many types of random variables are there in Fuzzy logic?
- |      |      |
|------|------|
| a) 4 | b) 3 |
| c) 2 | d) 1 |
- 10)** Which of the following fuzzy operators are utilized in fuzzy set theory?
- |        |        |
|--------|--------|
| a) AND | b) OR  |
| c) NOT | d) ALL |

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMUNICATION ENGINEERING**  
**Soft Computing**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**SECTION – I**

**Q.2 Attempt any FOUR.** **20**

- a) Define soft computing Explain it in detail.
- b) Write differences between soft computing and hard computing.
- c) Explain different operations in fuzzy sets.
- d) Write applications of fuzzy sets.
- e) Explain different defuzzification methods.

**SECTION – II**

**Q.3 Attempt any FOUR.** **20**

- a) Explain the Characteristics of Artificial Neural Network.
- b) Explain different activation function.
- c) Write application of Artificial Neural Network.
- d) Explain the concept of Biological Neurons.
- e) Explain Unsupervised Learning in details.

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 10

10

- Page 10 of 12

- 9)** The number of nodes in the input layer is 10 and the hidden layer is 5. The maximum number of connections from the input layer to the hidden layer are \_\_\_\_.
- |                 |                             |
|-----------------|-----------------------------|
| a) 50           | b) Less than 50             |
| c) More than 50 | d) It is an arbitrary value |
- 10)** Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of  $n$  classes ( $p_1, p_2, \dots, p_k$ ) such that sum of  $p$  over all  $n$  equals to 1?
- |            |         |
|------------|---------|
| a) Softmax | b) ReLu |
| c) Sigmoid | d) Tanh |

<b>Seat No.</b>	
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMUNICATION ENGINEERING**  
**Soft Computing**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**SECTION – I**

- Q.2 Attempt any FOUR.** **20**
- a) Define soft computing Explain it in detail.
  - b) Write differences between soft computing and hard computing.
  - c) Explain different operations in fuzzy sets.
  - d) Write applications of fuzzy sets.
  - e) Explain different defuzzification methods.

**SECTION – II**

- Q.3 Attempt any FOUR.** **20**
- a) Explain the Characteristics of Artificial Neural Network.
  - b) Explain different activation function.
  - c) Write application of Artificial Neural Network.
  - d) Explain the concept of Biological Neurons.
  - e) Explain Unsupervised Learning in details.

<b>Seat No.</b>	
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What is true about machine learning?
  - a) Machine Learning (ML) is that field of computer science
  - b) ML is a type of artificial intelligence that extract patterns out of raw data by using an algorithm or method.
  - c) The main focus of ML is to allow computer systems learn from experience without being explicitly programmed or human intervention.
  - d) All of the above.
- 2) What is machine learning?
  - a) The autonomous acquisition of knowledge through the use of computer programs
  - b) The autonomous acquisition of knowledge through the use of manual programs
  - c) The selective acquisition of knowledge through the use of computer programs
  - d) The selective acquisition of knowledge through the use of manual programs
- 3) Machine learning technique differ from statistical techniques in that machine learning methods
  - a) Typically assumes underlying distribution for the data
  - b) Are better able to deal with missing and noisy data
  - c) Are not able to explain their behaviors
  - d) Have trouble with large type datasets
- 4) Real-time decisions, Game AI, Learning Tasks, Skill Acquisition and Robot Navigation are applications of which of the following
  - a) Supervised Learning: Classification
  - b) Reinforcement Learning
  - c) Unsupervised Learning: Clustering
  - d) Unsupervised Learning: Regression
- 5) Target marketing, Recommended Systems and Customer Segmentation are applications in which of the following
  - a) Supervised Learning: Classification
  - b) Unsupervised Learning: Clustering
  - c) Unsupervised Learning: Regression
  - d) Reinforcement Learning



- 6) Fraud detection, image classification, Diagnostic and Customer Retention are applications in which of the following
- a) Unsupervised Learning: Regression
  - b) Supervised Learning: Classification
  - c) Unsupervised Learning: Clustering
  - d) Reinforcement Learning
- 7) Which of the following is FALSE about Deep Learning and Machine Learning algorithms?
- a) Deep learning algorithms work efficiently on a high amount of data.
  - b) Feature Extraction needs to be done manually in both ML and DL algorithms.
  - c) Deep learning algorithms are best suited for unstructured data.
  - d) Deep Learning algorithms require high computational power.
- 8) When performing regression or classification which of the following is the correct way to preprocess the data?
- a) Normalize the data---PCA---Training
  - b) PCA---Normalize PCA output---Training
  - c) Normalize the data---PCA---Normalize PCA output---Training
  - d) None of the above
- 9) The most widely used metrics and tools to access a classification model are
- a) Confusion Matrix
  - b) Cost Sensitive accuracy
  - c) Area under the ROC curve
  - d) All of the above
- 10) What is over fitting?
- a) Poor result in Training and poor result in test
  - b) Great result in training and poor result in test
  - c) Great result in training and Great result in test
  - d) Poor result in training and Great result in rest
- 11) What is Perceptron?
- a) A single layer feed-forward neural network with pre-processing
  - b) A neural network that contains feedback
  - c) A double layer auto-associative neural network
  - d) An auto-associative neural network
- 12) What is back propagation?
- a) It is another name given to the curvy function in the perceptron
  - b) It is transmission of error back through the network to allow weights to be adjusted so that the network can learn
  - c) It is another name given to the curvy function in the perceptron
  - d) None of the above

- 13) Which of the following is the disadvantage of Decision tree?
- a) Factor Analysis
  - b) Decision tree are robust to outliers
  - c) Decision tree are prone to be overfit
  - d) None of the above
- 14) Disadvantages of Naïve Bayes Classifier:
- a) Naive Bayes assumes that all features are independent or unrelated, so it cannot learn the relationship between
  - b) It performs well in Multi-class predictions as compared to the other
  - c) Naïve Bayes is one of the fast and easy ML algorithms to predict a class of
  - d) It is the most popular choice for text classification problems.

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any Three.** **12**

- a) What is Machine Learning? Give examples of Machine Learning Problem
- b) Explain Predictive and descriptive tasks?
- c) Explain Reinforcement learning with examples?
- d) Explain feature construction and Transformation?

**Q.3 Solve any two.** **16**

- a) Differentiate between Machine Learning and Deep Learning
- b) Explain in detail about accessing Performance of Regression and classification.
- c) Explain Regularization Theory and VC dimensions?

**Section – II**

**Q.4 Solve any Three.** **12**

- a) What are Neural network Elements? Explain Basic Perception?
- b) Explain Artificial Neural Network.
- c) Explain Least Square Method for classification?
- d) Explain Nearest Neighbor classification with Examples?

**Q.5 Solve any two.** **16**

- a) Explain Feed forward Network and Back Propagation Algorithm with examples?
- b) Explain Image and Speed Recognition?
- c) Explain Email Spam and Malware Filtering?

Seat No.	
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Set Q
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) When performing regression or classification which of the following is the correct way to preprocess the data?
  - a) Normalize the data---PCA---Training
  - b) PCA---Normalize PCA output---Training
  - c) Normalize the data---PCA---Normalize PCA output---Training
  - d) None of the above
- 2) The most widely used metrics and tools to access a classification model are
  - a) Confusion Matrix
  - b) Cost Sensitive accuracy
  - c) Area under the ROC curve
  - d) All of the above
- 3) What is over fitting?
  - a) Poor result in Training and poor result in test
  - b) Great result in training and poor result in test
  - c) Great result in training and Great result in test
  - d) Poor result in training and Great result in rest
- 4) What is Perceptron?
  - a) A single layer feed-forward neural network with pre-processing
  - b) A neural network that contains feedback
  - c) A double layer auto-associative neural network
  - d) An auto-associative neural network
- 5) What is back propagation?
  - a) It is another name given to the curvy function in the perceptron
  - b) It is transmission of error back through the network to allow weights to be adjusted so that the network can learn
  - c) It is another name given to the curvy function in the perceptron
  - d) None of the above
- 6) Which of the following is the disadvantage of Decision tree?
  - a) Factor Analysis
  - b) Decision tree are robust to outliers
  - c) Decision tree are prone to be overfit
  - d) None of the above

- 7) Disadvantages of Naïve Bayes Classifier:
- a) Naive Bayes assumes that all features are independent or unrelated, so it cannot learn the relationship between
  - b) It performs well in Multi-class predictions as compared to the other
  - c) Naïve Bayes is one of the fast and easy ML algorithms to predict a class of
  - d) It is the most popular choice for text classification problems.
- 8) What is true about machine learning?
- a) Machine Learning (ML) is that field of computer science
  - b) ML is a type of artificial intelligence that extract patterns out of raw data by using an algorithm or method.
  - c) The main focus of ML is to allow computer systems learn from experience without being explicitly programmed or human intervention.
  - d) All of the above.
- 9) What is machine learning?
- a) The autonomous acquisition of knowledge through the use of computer programs
  - b) The autonomous acquisition of knowledge through the use of manual programs
  - c) The selective acquisition of knowledge through the use of computer programs
  - d) The selective acquisition of knowledge through the use of manual programs
- 10) Machine learning technique differ from statistical techniques in that machine learning methods
- a) Typically assumes underlying distribution for the data
  - b) Are better able to deal with missing and noisy data
  - c) Are not able to explain their behaviors
  - d) Have trouble with large type datasets
- 11) Real-time decisions, Game AI, Learning Tasks, Skill Acquisition and Robot Navigation are applications of which of the following
- a) Supervised Learning: Classification
  - b) Reinforcement Learning
  - c) Unsupervised Learning: Clustering
  - d) Unsupervised Learning: Regression
- 12) Target marketing, Recommended Systems and Customer Segmentation are applications in which of the following
- a) Supervised Learning: Classification
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- 13) Fraud detection, image classification, Diagnostic and Customer Retention are applications in which of the following
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- 14) Which of the following is FALSE about Deep Learning and Machine Learning algorithms?
- a) Deep learning algorithms work efficiently on a high amount of data.
  - b) Feature Extraction needs to be done manually in both ML and DL algorithms.
  - c) Deep learning algorithms are best suited for unstructured data.
  - d) Deep Learning algorithms require high computational power.

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<b>Set Q</b>
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Solve any Three. 12**
- a) What is Machine Learning? Give examples of Machine Learning Problem
  - b) Explain Predictive and descriptive tasks?
  - c) Explain Reinforcement learning with examples?
  - d) Explain feature construction and Transformation?
- Q.3 Solve any two. 16**
- a) Differentiate between Machine Learning and Deep Learning
  - b) Explain in detail about accessing Performance of Regression and classification.
  - c) Explain Regularization Theory and VC dimensions?

**Section – II**

- Q.4 Solve any Three. 12**
- a) What are Neural network Elements? Explain Basic Perception?
  - b) Explain Artificial Neural Network.
  - c) Explain Least Square Method for classification?
  - d) Explain Nearest Neighbor classification with Examples?
- Q.5 Solve any two. 16**
- a) Explain Feed forward Network and Back Propagation Algorithm with examples?
  - b) Explain Image and Speech Recognition?
  - c) Explain Email Spam and Malware Filtering?

<b>Seat No.</b>	
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What is Perceptron?
  - a) A single layer feed-forward neural network with pre-processing
  - b) A neural network that contains feedback
  - c) A double layer auto-associative neural network
  - d) An auto-associative neural network
- 2) What is back propagation?
  - a) It is another name given to the curvy function in the perceptron
  - b) It is transmission of error back through the network to allow weights to be adjusted so that the network can learn
  - c) It is another name given to the curvy function in the perceptron
  - d) None of the above
- 3) Which of the following is the disadvantage of Decision tree?
  - a) Factor Analysis
  - b) Decision tree are robust to outliers
  - c) Decision tree are prone to be overfit
  - d) None of the above
- 4) Disadvantages of Naïve Bayes Classifier:
  - a) Naive Bayes assumes that all features are independent or unrelated, so it cannot learn the relationship between
  - b) It performs well in Multi-class predictions as compared to the other
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  - c) The main focus of ML is to allow computer systems learn from experience without being explicitly programmed or human intervention.
  - d) All of the above.



- 6) What is machine learning?
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  - b) The autonomous acquisition of knowledge through the use of manual programs
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- 8) Real-time decisions, Game AI, Learning Tasks, Skill Acquisition and Robot Navigation are applications of which of the following
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- 11) Which of the following is FALSE about Deep Learning and Machine Learning algorithms?
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  - b) Feature Extraction needs to be done manually in both ML and DL algorithms.
  - c) Deep learning algorithms are best suited for unstructured data.
  - d) Deep Learning algorithms require high computational power.
- 12) When performing regression or classification which of the following is the correct way to preprocess the data?
- a) Normalize the data---PCA---Training
  - b) PCA---Normalize PCA output---Training
  - c) Normalize the data---PCA---Normalize PCA output---Training
  - d) None of the above

- 13) The most widely used metrics and tools to assess a classification model are
- a) Confusion Matrix
  - b) Cost Sensitive accuracy
  - c) Area under the ROC curve
  - d) All of the above
- 14) What is over fitting?
- a) Poor result in Training and poor result in test
  - b) Great result in training and poor result in test
  - c) Great result in training and Great result in test
  - d) Poor result in training and Great result in test

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any Three. 12**

- a) What is Machine Learning? Give examples of Machine Learning Problem
- b) Explain Predictive and descriptive tasks?
- c) Explain Reinforcement learning with examples?
- d) Explain feature construction and Transformation?

**Q.3 Solve any two. 16**

- a) Differentiate between Machine Learning and Deep Learning
- b) Explain in detail about accessing Performance of Regression and classification.
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**Section – II**

**Q.4 Solve any Three. 12**

- a) What are Neural network Elements? Explain Basic Perception?
- b) Explain Artificial Neural Network.
- c) Explain Least Square Method for classification?
- d) Explain Nearest Neighbor classification with Examples?

**Q.5 Solve any two. 16**

- a) Explain Feed forward Network and Back Propagation Algorithm with examples?
- b) Explain Image and Speed Recognition?
- c) Explain Email Spam and Malware Filtering?

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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- 1) Fraud detection, image classification, Diagnostic and Customer Retention are applications in which of the following
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  - d) Reinforcement Learning
- 2) Which of the following is FALSE about Deep Learning and Machine Learning algorithms?
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- 4) The most widely used metrics and tools to access a classification model are
 

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Solve any Three. 12**
- a) What is Machine Learning? Give examples of Machine Learning Problem
  - b) Explain Predictive and descriptive tasks?
  - c) Explain Reinforcement learning with examples?
  - d) Explain feature construction and Transformation?
- Q.3 Solve any two. 16**
- a) Differentiate between Machine Learning and Deep Learning
  - b) Explain in detail about accessing Performance of Regression and classification.
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**Section – II**

- Q.4 Solve any Three. 12**
- a) What are Neural network Elements? Explain Basic Perception?
  - b) Explain Artificial Neural Network.
  - c) Explain Least Square Method for classification?
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- Q.5 Solve any two. 16**
- a) Explain Feed forward Network and Back Propagation Algorithm with examples?
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  - c) Explain Email Spam and Malware Filtering?

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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Q. No. 1 should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark. Don't forget to mention Q.P. Set (P,Q,R,S) on top of page.  
 3) Figure on right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The physical layer is concerned with the movement of \_\_\_\_\_ over the physical medium.
 

a) programs	b) dialogs
c) protocols	d) bits
- 2) In the OSI model, as a data packet moves from the lower to the upper layers, headers are \_\_\_\_\_.
 

a) added	b) removed
c) rearranged	d) modified
- 3) Which of the following is an application layer service?
 

a) network virtual terminal
b) file transfer, access, and management
c) mail service
d) all of the above
- 4) IPv6 has \_\_\_\_\_ bit addresses.
 

a) 32	b) 64
c) 128	d) variable
- 5) The \_\_\_\_\_ layer adds a header to the packet coming from the upper layer that includes the logical addresses of the sender and receiver.
 

a) physical	b) data link
c) network	d) none of the above
- 6) \_\_\_\_\_ is a process-to-process protocol that adds only port addresses, checksum error control, and length information to the data from the upper layer.
 

a) TCP	b) UDP
c) IP	d) none of the above
- 7) A port address in TCP/IP is \_\_\_\_\_ bits long.
 

a) 32	b) 48
c) 16	d) none of the above



- 8) Routers function in the \_\_\_\_\_ layers.
- a) physical and data link
  - b) physical, data link, and network
  - c) data link and network
  - d) none of the above
- 9) Identify the class of the following IP address: 191.1.2.3.
- a) class A
  - b) class B
  - c) class C
  - d) none of the above
- 10) The number of addresses in a class C block is \_\_\_\_\_.
- a) 65,534
  - b) 16,777,216
  - c) 256
  - d) none of the above
- 11) \_\_\_\_\_ is a dynamic mapping protocol in which a physical address is found for a given logical address.
- a) ARP
  - b) RARP
  - c) both a and b
  - d) none of the above
- 12) The IP header size \_\_\_\_\_.
- a) is 20 to 60 bytes long
  - b) is 20 bytes long
  - c) is 60 bytes long
  - d) none of the above
- 13) ICMP messages are divided into two broad categories:
- a) query and error reporting messages
  - b) request and response messages
  - c) request and reply messages
  - d) none of the above
- 14) UDP is an acronym for \_\_\_\_\_.
- a) User Delivery Protocol
  - b) User Datagram Procedure
  - c) User Datagram Protocol
  - d) none of the above

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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- What do you mean by network topology? Discuss star and Ring topology with its advantages and disadvantages.
- Why we require framing? Explain any one technique for framing of data.
- Draw and Explain Mode transition diagram for HDLC station.
- What is the advantage of piggybacking of the acknowledgement?
- Discuss stop and wait protocol for flow control.
- Differentiate between circuit switching and packet switching.

**Q.3 Solve any two of the following questions. 12**

- With the help of frame format explain in detail IEEE 802.3 Ethernet Lan standard.
- Draw OSI Layer model and discuss the function of each layer.
- How CRC is used for Error control. A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is  $x^4+x+1$ . What is the actual bit string transmitted?

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- Discuss count to infinity problem in Link state routing.
- State optimality principle in routing and explain it with suitable example.
- What is the use of subnet mask?
- Draw and explain UDP header fields.
- Explain Classful IP address representation.
- List and explain different ICMP Error messages.

**Q.5 Solve any two of the following questions. 12**

- Discuss shortest path routing algorithm with suitable example.
- Draw IPV4 header format and discuss the fields related to fragmentation and reassembly.
- Explain FTP Protocol in detail.

Seat No.	
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Set Q
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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication**

Day & Date: Tuesday, 31-01-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

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  - c) protocols
  - d) bits

- 9) In the OSI model, as a data packet moves from the lower to the upper layers, headers are \_\_\_\_\_.
  - a) added
  - b) removed
  - c) rearranged
  - d) modified
- 10) Which of the following is an application layer service?
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  - c) mail service
  - d) all of the above
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  - a) TCP
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  - c) IP
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  - a) 32
  - b) 48
  - c) 16
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Seat No.	
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Set **Q**

**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

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- Explain FTP Protocol in detail.

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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication**

Day & Date: Tuesday, 31-01-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) \_\_\_\_\_ is a dynamic mapping protocol in which a physical address is found for a given logical address.
 

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c) both a and b	d) none of the above
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a) 32	b) 64
c) 128	d) variable

- 9) The \_\_\_\_\_ layer adds a header to the packet coming from the upper layer that includes the logical addresses of the sender and receiver.
- a) physical
  - b) data link
  - c) network
  - d) none of the above
- 10) \_\_\_\_\_ is a process-to-process protocol that adds only port addresses, checksum error control, and length information to the data from the upper layer.
- a) TCP
  - b) UDP
  - c) IP
  - d) none of the above
- 11) A port address in TCP/IP is \_\_\_\_\_ bits long.
- a) 32
  - b) 48
  - c) 16
  - d) none of the above
- 12) Routers function in the \_\_\_\_\_ layers.
- a) physical and data link
  - b) physical, data link, and network
  - c) data link and network
  - d) none of the above
- 13) Identify the class of the following IP address: 191.1.2.3.
- a) class A
  - b) class B
  - c) class C
  - d) none of the above
- 14) The number of addresses in a class C block is \_\_\_\_\_.
- a) 65,534
  - b) 16,777,216
  - c) 256
  - d) none of the above

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Set **R**

**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- What do you mean by network topology? Discuss star and Ring topology with its advantages and disadvantages.
- Why we require framing? Explain any one technique for framing of data.
- Draw and Explain Mode transition diagram for HDLC station.
- What is the advantage of piggybacking of the acknowledgement?
- Discuss stop and wait protocol for flow control.
- Differentiate between circuit switching and packet switching.

**Q.3 Solve any two of the following questions. 12**

- With the help of frame format explain in detail IEEE 802.3 Ethernet Lan standard.
- Draw OSI Layer model and discuss the function of each layer.
- How CRC is used for Error control. A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is  $x^4+x+1$ . What is the actual bit string transmitted?

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- Discuss count to infinity problem in Link state routing.
- State optimality principle in routing and explain it with suitable example.
- What is the use of subnet mask?
- Draw and explain UDP header fields.
- Explain Classful IP address representation.
- List and explain different ICMP Error messages.

**Q.5 Solve any two of the following questions. 12**

- Discuss shortest path routing algorithm with suitable example.
- Draw IPV4 header format and discuss the fields related to fragmentation and reassembly.
- Explain FTP Protocol in detail.



Seat No.	
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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Q. No. 1 should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark. Don't forget to mention Q.P. Set (P,Q,R,S) on top of page.  
 3) Figure on right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) \_\_\_\_\_ is a process-to-process protocol that adds only port addresses, checksum error control, and length information to the data from the upper layer.
 

a) TCP	b) UDP
c) IP	d) none of the above
- 2) A port address in TCP/IP is \_\_\_\_\_ bits long.
 

a) 32	b) 48
c) 16	d) none of the above
- 3) Routers function in the \_\_\_\_\_ layers.
 

a) physical and data link
b) physical, data link, and network
c) data link and network
d) none of the above
- 4) Identify the class of the following IP address: 191.1.2.3.
 

a) class A	b) class B
c) class C	d) none of the above
- 5) The number of addresses in a class C block is \_\_\_\_\_.
 

a) 65,534	b) 16,777,216
c) 256	d) none of the above
- 6) \_\_\_\_\_ is a dynamic mapping protocol in which a physical address is found for a given logical address.
 

a) ARP	b) RARP
c) both a and b	d) none of the above
- 7) The IP header size \_\_\_\_\_.
 

a) is 20 to 60 bytes long	b) is 20 bytes long
c) is 60 bytes long	d) none of the above
- 8) ICMP messages are divided into two broad categories:
 

a) query and error reporting messages
b) request and response messages
c) request and reply messages
d) none of the above

- 9) UDP is an acronym for \_\_\_\_\_.  
a) User Delivery Protocol                      b) User Datagram Procedure  
c) User Datagram Protocol                    d) none of the above
- 10) The physical layer is concerned with the movement of \_\_\_\_\_ over the physical medium.  
a) programs                                      b) dialogs  
c) protocols                                      d) bits
- 11) In the OSI model, as a data packet moves from the lower to the upper layers, headers are \_\_\_\_\_.  
a) added    b) removed  
c) rearranged                                    d) modified
- 12) Which of the following is an application layer service?  
a) network virtual terminal  
b) file transfer, access, and management  
c) mail service  
d) all of the above
- 13) IPv6 has \_\_\_\_\_ bit addresses.  
a) 32    b) 64  
c) 128    d) variable
- 14) The \_\_\_\_\_ layer adds a header to the packet coming from the upper layer that includes the logical addresses of the sender and receiver.  
a) physical                                      b) data link  
c) network                                        d) none of the above

Seat No.	
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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Communication**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- What do you mean by network topology? Discuss star and Ring topology with its advantages and disadvantages.
- Why we require framing? Explain any one technique for framing of data.
- Draw and Explain Mode transition diagram for HDLC station.
- What is the advantage of piggybacking of the acknowledgement?
- Discuss stop and wait protocol for flow control.
- Differentiate between circuit switching and packet switching.

**Q.3 Solve any two of the following questions. 12**

- With the help of frame format explain in detail IEEE 802.3 Ethernet Lan standard.
- Draw OSI Layer model and discuss the function of each layer.
- How CRC is used for Error control. A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is  $x^4+x+1$ . What is the actual bit string transmitted?

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- Discuss count to infinity problem in Link state routing.
- State optimality principle in routing and explain it with suitable example.
- What is the use of subnet mask?
- Draw and explain UDP header fields.
- Explain Classful IP address representation.
- List and explain different ICMP Error messages.

**Q.5 Solve any two of the following questions. 12**

- Discuss shortest path routing algorithm with suitable example.
- Draw IPV4 header format and discuss the fields related to fragmentation and reassembly.
- Explain FTP Protocol in detail.

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Internet of Things**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ When processor is fully powered up and doing everything that embedded system was design to do
  - a) Sleep mode
  - b) Run mode
  - c) Deep Sleep mode
  - d) Fault Mode
- 2) Market window is the period during which the product would have \_\_\_\_\_.
  - a) No Sale
  - b) Low Sale
  - c) Moderate Sale
  - d) Highest sale
- 3) The ability to change the functionality of the system without incurring heavy NRE cost is called as \_\_\_\_\_.
  - a) Performance
  - b) Time-to-prototype
  - c) Flexibility
  - d) Time-to-market
- 4) After Execution of MUL r4,r3,r2 result will be stored in \_\_\_\_\_.
  - a) R1
  - b) R2
  - c) R3
  - d) R4
- 5) MVN is \_\_\_\_\_ type of instruction used in ARM.
  - a) Arithmetic
  - b) Data Processing
  - c) Logical
  - d) Branch
- 6) The special purpose register R15 is the PC contains \_\_\_\_\_.
  - a) Address at the next instruction to be fetched by the processor
  - b) Address at the current instruction to be fetched by the processor
  - c) Address at the previous instruction to be fetched by the processor
  - d) none of the above
- 7) The \_\_\_\_\_ can shift or rotate operand by specified number of bits prior to arithmetic or logical operations
  - a) Barrel shifter
  - b) SP
  - c) LR
  - d) GPIO
- 8) The \_\_\_\_\_ provides the connectivity between individual tags and the tracking/management system.
  - a) RFID Tag
  - b) RFID Reader
  - c) RFID Scanner
  - d) None of the above

- 9) \_\_\_\_\_ which responds to advertising packet with "CONNECT\_REQ" packet.
- a) Initialization Phase
  - b) Discovery Phase
  - c) Connecting Phase
  - d) Initiator Phase
- 10) \_\_\_\_\_ is designed for control an sensor network.
- a) Bluetooth
  - b) RFID
  - c) Zigbee
  - d) All of the above
- 11) In the star topology, communication is established between devices and a single central controller, called the \_\_\_\_\_.
- a) Reduce Function Devices
  - b) Full Function Devices
  - c) PAN coordinator
  - d) None of the Above
- 12) Which one of the following protocols is lightweight?
- a) HTTP
  - b) IP
  - c) CoAP
  - d) MQTT
- 13) Which of the following is the example of a short-range wireless network?
- a) Wi-Fi
  - b) SPI
  - c) I2C
  - d) VPN
- 14) What are the key components of a M2M system?
- a) Protocols
  - b) Vortex DDS
  - c) Sensors and Wi-Fi
  - d) Smart Homes

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Internet of Things**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full mark.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) What are the architectural layers in a modified OSI model for IoT systems?
- b) Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
- c) Explain various IDE's for embedded development.
- d) Explain Register Mapping of Cortex M-3 with function of each register.
- e) State various applications of IoT. Describe different components of IoT.

**Q.3 Attempt any Two.** **12**

- a) Give example with necessary block/connection diagram of IoT's used in a smart home with sensors, actuators and smart home automation software.
- b) Describe Cortex M-3 Architecture with block diagram.
- c) Draw state diagram and explain each state of Operating Modes of Cortex M-3. State features of NVIC

**Section – II**

**Q.4 Attempt any Four** **16**

- a) Write short note on RFID tags and RFID controllers.
- b) How Bluetooth Low Energy establishes connection for data exchange. Draw connection establishment phases and explain each phase in detail. Explain Active states of BLE in detail.
- c) Explain working of ZigBee protocol in detail.
- d) State and explain different components of RFID Communication technology with neat block diagrams.
- e) State and explain various internet connection types in detail.

**Q.5 Attempt any Two.** **12**

- a) Describe MQTT Components with architecture in detail.
- b) Draw IPV4 Packet Structure. Explain Addressing modes of IPV4.
- c) Write a note on IOT- Cloud Platforms and Performance Metrics.

Seat No.	
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Internet of Things**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The \_\_\_\_\_ provides the connectivity between individual tags and the tracking/management system.
 

a) RFID Tag	b) RFID Reader
c) RFID Scanner	d) None of the above
- 2) \_\_\_\_\_ which responds to advertising packet with "CONNECT\_REQ" packet.
 

a) Initialization Phase	b) Discovery Phase
c) Connecting Phase	d) Initiator Phase
- 3) \_\_\_\_\_ is designed for control an sensor network.
 

a) Bluetooth	b) RFID
c) Zigbee	d) All of the above
- 4) In the star topology, communication is established between devices and a single central controller, called the \_\_\_\_\_.
 

a) Reduce Function Devices
b) Full Function Devices
c) PAN coordinator
d) None of the Above
- 5) Which one of the following protocols is lightweight?
 

a) HTTP	b) IP
c) CoAP	d) MQTT
- 6) Which of the following is the example of a short-range wireless network?
 

a) Wi-Fi	b) SPI
c) I2C	d) VPN
- 7) What are the key components of a M2M system?
 

a) Protocols	b) Vortex DDS
c) Sensors and Wi-Fi	d) Smart Homes
- 8) \_\_\_\_\_ When processor is fully powered up and doing everything that embedded system was design to do
 

a) Sleep mode	b) Run mode
c) Deep Sleep mode	d) Fault Mode





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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Internet of Things**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full mark.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) What are the architectural layers in a modified OSI model for IoT systems?
- b) Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
- c) Explain various IDE's for embedded development.
- d) Explain Register Mapping of Cortex M-3 with function of each register.
- e) State various applications of IoT. Describe different components of IoT.

**Q.3 Attempt any Two.** **12**

- a) Give example with necessary block/connection diagram of IoT's used in a smart home with sensors, actuators and smart home automation software.
- b) Describe Cortex M-3 Architecture with block diagram.
- c) Draw state diagram and explain each state of Operating Modes of Cortex M-3. State features of NVIC

**Section – II**

**Q.4 Attempt any Four** **16**

- a) Write short note on RFID tags and RFID controllers.
- b) How Bluetooth Low Energy establishes connection for data exchange. Draw connection establishment phases and explain each phase in detail. Explain Active states of BLE in detail.
- c) Explain working of ZigBee protocol in detail.
- d) State and explain different components of RFID Communication technology with neat block diagrams.
- e) State and explain various internet connection types in detail.

**Q.5 Attempt any Two.** **12**

- a) Describe MQTT Components with architecture in detail.
- b) Draw IPV4 Packet Structure. Explain Addressing modes of IPV4.
- c) Write a note on IOT- Cloud Platforms and Performance Metrics.

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Internet of Things**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) In the star topology, communication is established between devices and a single central controller, called the \_\_\_\_\_.  
 a) Reduce Function Devices  
 b) Full Function Devices  
 c) PAN coordinator  
 d) None of the Above
- 2) Which one of the following protocols is lightweight?  
 a) HTTP  
 b) IP  
 c) CoAP  
 d) MQTT
- 3) Which of the following is the example of a short-range wireless network?  
 a) Wi-Fi  
 b) SPI  
 c) I2C  
 d) VPN
- 4) What are the key components of a M2M system?  
 a) Protocols  
 b) Vortex DDS  
 c) Sensors and Wi-Fi  
 d) Smart Homes
- 5) \_\_\_\_\_ When processor is fully powered up and doing everything that embedded system was design to do  
 a) Sleep mode  
 b) Run mode  
 c) Deep Sleep mode  
 d) Fault Mode
- 6) Market window is the period during which the product would have \_\_\_\_\_.  
 a) No Sale  
 b) Low Sale  
 c) Moderate Sale  
 d) Highest sale
- 7) The ability to change the functionality of the system without incurring heavy NRE cost is called as \_\_\_\_\_.  
 a) Performance  
 b) Time-to-prototype  
 c) Flexibility  
 d) Time-to-market
- 8) After Execution of MUL r4,r3,r2 result will be stored in \_\_\_\_\_.  
 a) R1  
 b) R2  
 c) R3  
 d) R4



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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Internet of Things**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full mark.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) What are the architectural layers in a modified OSI model for IoT systems?
- b) Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
- c) Explain various IDE's for embedded development.
- d) Explain Register Mapping of Cortex M-3 with function of each register.
- e) State various applications of IoT. Describe different components of IoT.

**Q.3 Attempt any Two.** **12**

- a) Give example with necessary block/connection diagram of IoT's used in a smart home with sensors, actuators and smart home automation software.
- b) Describe Cortex M-3 Architecture with block diagram.
- c) Draw state diagram and explain each state of Operating Modes of Cortex M-3. State features of NVIC

**Section – II**

**Q.4 Attempt any Four** **16**

- a) Write short note on RFID tags and RFID controllers.
- b) How Bluetooth Low Energy establishes connection for data exchange. Draw connection establishment phases and explain each phase in detail. Explain Active states of BLE in detail.
- c) Explain working of ZigBee protocol in detail.
- d) State and explain different components of RFID Communication technology with neat block diagrams.
- e) State and explain various internet connection types in detail.

**Q.5 Attempt any Two.** **12**

- a) Describe MQTT Components with architecture in detail.
- b) Draw IPV4 Packet Structure. Explain Addressing modes of IPV4.
- c) Write a note on IOT- Cloud Platforms and Performance Metrics.

<b>Seat No.</b>	
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- 8) Which of the following is the example of a short-range wireless network?

  - a) Wi-Fi
  - b) SPI
  - c) I2C
  - d) VPN
- 9) What are the key components of a M2M system?

  - a) Protocols
  - b) Vortex DDS
  - c) Sensors and Wi-Fi
  - d) Smart Homes
- 10) \_\_\_\_\_ When processor is fully powered up and doing everything that embedded system was design to do

  - a) Sleep mode
  - b) Run mode
  - c) Deep Sleep mode
  - d) Fault Mode
- 11) Market window is the period during which the product would have \_\_\_\_\_.

  - a) No Sale
  - b) Low Sale
  - c) Moderate Sale
  - d) Highest sale
- 12) The ability to change the functionality of the system without incurring heavy NRE cost is called as \_\_\_\_\_.

  - a) Performance
  - b) Time-to-prototype
  - c) Flexibility
  - d) Time-to-market
- 13) After Execution of MUL r4,r3,r2 result will be stored in \_\_\_\_\_.

  - a) R1
  - b) R2
  - c) R3
  - d) R4
- 14) MVN is \_\_\_\_\_ type of instruction used in ARM.

  - a) Arithmetic
  - b) Data Processing
  - c) Logical
  - d) Branch

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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Internet of Things**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full mark.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) What are the architectural layers in a modified OSI model for IoT systems?
- b) Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
- c) Explain various IDE's for embedded development.
- d) Explain Register Mapping of Cortex M-3 with function of each register.
- e) State various applications of IoT. Describe different components of IoT.

**Q.3 Attempt any Two.** **12**

- a) Give example with necessary block/connection diagram of IoT's used in a smart home with sensors, actuators and smart home automation software.
- b) Describe Cortex M-3 Architecture with block diagram.
- c) Draw state diagram and explain each state of Operating Modes of Cortex M-3. State features of NVIC

**Section – II**

**Q.4 Attempt any Four** **16**

- a) Write short note on RFID tags and RFID controllers.
- b) How Bluetooth Low Energy establishes connection for data exchange. Draw connection establishment phases and explain each phase in detail. Explain Active states of BLE in detail.
- c) Explain working of ZigBee protocol in detail.
- d) State and explain different components of RFID Communication technology with neat block diagrams.
- e) State and explain various internet connection types in detail.

**Q.5 Attempt any Two.** **12**

- a) Describe MQTT Components with architecture in detail.
- b) Draw IPV4 Packet Structure. Explain Addressing modes of IPV4.
- c) Write a note on IOT- Cloud Platforms and Performance Metrics.

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**Fourth Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Database Management System**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 03 Hours

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which type of data can be stored in the database?
 

a) Image oriented data	b) Text, files containing data
c) Data in the form of audio or video	d) All of the above
- 2) Which of the following is not a function of the database?
 

a) Managing stored data	b) Manipulating data
c) Security for stored data	d) Analysing code
- 3) Which of the following is known as a set of entities of the same type that share same properties, or attributes?
 

a) Relation set	b) Tuples
c) Entity set	d) Entity Relation model
- 4) What does an RDBMS consist of?
 

a) Collection of Records	b) Collection of Keys
c) Collection of Tables	d) Collection of Fields
- 5) Which command is used to remove a relation from an SQL?
 

a) Drop table	b) Delete
c) Purge	d) Remove
- 6) The top level of the hierarchy consists of \_\_\_\_\_ each of which can obtain \_\_\_\_\_.
 

a) Schemas, Catalogs	b) Schemas, Environment
c) Environment, Schemas	d) Catalogs, Schemas
- 7) Which of the following is not the utility of DBMS?
 

i) Backup    ii) Loading    iii) Process Organization    iv) File organization	
a) i, ii, and iv only	b) i, ii and iii only
c) i, iii and iv only	d) All i, ii, iii, and iv
- 8) Which of the following is the subset of SQL commands used to manipulate Oracle Structures, including tables?
 

a) Data Described Language	b) Data Retrieval Language
c) Data Manipulation Language	d) Data Definition Language



- 9) Course(course\_id,sec\_id,semester)  
Here the course\_id,sec\_id and semester are \_\_\_\_ and course is a \_\_\_\_
- a) Relations, Attribute                      b) Attributes, Relation  
c) Tuple, Relation                          d) Tuple, Attributes
- 10) The attribute name could be structured as an attribute consisting of first name, middle initial, and last name. This type of attribute is called \_\_\_\_
- a) Simple attribute                          b) Composite attribute  
c) Multivalued attribute                      d) Derived attribute
- 11) If h is any hashing function and is used to hash n keys in to a table of size m, where  $n \leq m$ , the expected number of collisions involving a particular key x is:
- a) Less than 1                                  b) Less than n  
c) Less than m                                  d) Less than  $n/2$
- 12) A transaction is delimited by statements (or function calls) of the form \_\_\_\_
- a) Begin transaction and end transaction  
b) Start transaction and stop transaction  
c) Get transaction and post transaction  
d) Read transaction and write transaction
- 13) What are the ways of dealing with deadlock?
- a) Deadlock prevention                      b) Deadlock recovery  
c) Deadlock detection                          d) All of the mentioned
- 14) Which utilities can we use to export data from sql server to a text file?
- a) DTS export wizard                          b) BCP  
c) ISQL    d) DTS export wizard and BCP

Seat No.	
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**Fourth.Y. (B. Tech) (Sem – I) (New)(CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Database Management System**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any three.** **12**

- a) What are different data models? Explain any one.
- b) What are the different components of DBMS?
- c) Explain in detail Entity relationship model.
- d) Explain data abstraction or 3 schema architecture.

**Q.3 Attempt any two.** **16**

- a) Explain Fundamental and additional relational algebra operations with example.
- b) Explain basic notations of ER diagrams and also explain degree of relationship.
- c) Define SQL data. What are different SQL data types explain in detail.

**Section – II**

**Q.4 Attempt any three.** **12**

- a) What is Normalization? Explain Boyce-Codd Normal Form.
- b) Explain concurrency control with locking method. Explain with example.
- c) Give comparison in between Indexing and hashing.
- d) What is Bigdata? What are the Characteristics of Bigdata?

**Q.5 Attempt any two.** **16**

- a) Write short note on conflict and view serializability.
- b) What is mean by hashing? Explain static hashing and dynamic hashing.
- c) Explain concurrency control with time stamping method. Explain with examples.

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**Fourth Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Database Management System**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
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**MCQ/Objective Type Questions**

Duration: 03 Hours

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is the subset of SQL commands used to manipulate Oracle Structures, including tables?
  - a) Data Described Language      b) Data Retrieval Language
  - c) Data Manipulation Language      d) Data Definition Language
- 2) Course(course\_id, sec\_id, semester)  
 Here the course\_id, sec\_id and semester are \_\_\_\_\_ and course is a \_\_\_\_\_.
  - a) Relations, Attribute      b) Attributes, Relation
  - c) Tuple, Relation      d) Tuple, Attributes
- 3) The attribute name could be structured as an attribute consisting of first name, middle initial, and last name. This type of attribute is called \_\_\_\_\_.
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  - a) Deadlock prevention      b) Deadlock recovery
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- 7) Which utilities can we use to export data from sql server to a text file?
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- 8) Which type of data can be stored in the database?  
a) Image oriented data                      b) Text, files containing data  
c) Data in the form of audio or video      d) All of the above
- 9) Which of the following is not a function of the database?  
a) Managing stored data                      b) Manipulating data  
c) Security for stored data                      d) Analysing code
- 10) Which of the following is known as a set of entities of the same type that share same properties, or attributes?  
a) Relation set                                      b) Tuples  
c) Entity set                                        d) Entity Relation model
- 11) What does an RDBMS consist of?  
a) Collection of Records                      b) Collection of Keys  
c) Collection of Tables                        d) Collection of Fields
- 12) Which command is used to remove a relation from an SQL?  
a) Drop table                                      b) Delete  
c) Purge    d) Remove
- 13) The top level of the hierarchy consists of \_\_\_\_\_ each of which can obtain \_\_\_\_\_.  
a) Schemas, Catalogs                      b) Schemas, Environment  
c) Environment, Schemas                      d) Catalogs, Schemas
- 14) Which of the following is not the utility of DBMS?  
i) Backup    ii) Loading    iii) Process Organization    iv) File organization  
a) i, ii, and iv only                              b) i, ii and iii only  
c) i, iii and iv only                                d) All i, ii, iii, and iv

Seat No.	
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**Fourth.Y. (B. Tech) (Sem – I) (New)(CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Database Management System**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any three.** **12**

- a) What are different data models? Explain any one.
- b) What are the different components of DBMS?
- c) Explain in detail Entity relationship model.
- d) Explain data abstraction or 3 schema architecture.

**Q.3 Attempt any two.** **16**

- a) Explain Fundamental and additional relational algebra operations with example.
- b) Explain basic notations of ER diagrams and also explain degree of relationship.
- c) Define SQL data. What are different SQL data types explain in detail.

**Section – II**

**Q.4 Attempt any three.** **12**

- a) What is Normalization? Explain Boyce-Codd Normal Form.
- b) Explain concurrency control with locking method. Explain with example.
- c) Give comparison in between Indexing and hashing.
- d) What is Bigdata? What are the Characteristics of Bigdata?

**Q.5 Attempt any two.** **16**

- a) Write short note on conflict and view serializability.
- b) What is mean by hashing? Explain static hashing and dynamic hashing.
- c) Explain concurrency control with time stamping method. Explain with examples.

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**Fourth Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Database Management System**

Day & Date: Tuesday, 07-02-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 03 Hours

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) If  $h$  is any hashing function and is used to hash  $n$  keys in to a table of size  $m$ , where  $n \leq m$ , the expected number of collisions involving a particular key  $x$  is:
 

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- 2) A transaction is delimited by statements (or function calls) of the form \_\_\_\_\_
 

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- 3) What are the ways of dealing with deadlock?
 

a) Deadlock prevention	b) Deadlock recovery
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- 4) Which utilities can we use to export data from sql server to a text file?
 

a) DTS export wizard	b) BCP
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- 5) Which type of data can be stored in the database?
 

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- 6) Which of the following is not a function of the database?
 

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- 7) Which of the following is known as a set of entities of the same type that share same properties, or attributes?
 

a) Relation set	b) Tuples
c) Entity set	d) Entity Relation model
- 8) What does an RDBMS consist of?
 

a) Collection of Records	b) Collection of Keys
c) Collection of Tables	d) Collection of Fields



Seat No.	
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**Fourth.Y. (B. Tech) (Sem – I) (New)(CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Database Management System**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any three.** **12**

- a) What are different data models? Explain any one.
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**Fourth Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Database Management System**

Day & Date: Tuesday, 07-02-2023  
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Duration: 03 Hours

Marks: 14

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- 1) The top level of the hierarchy consists of \_\_\_\_\_ each of which can obtain \_\_\_\_\_.  
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- 13) What does an RDBMS consist of?
- a) Collection of Records
  - b) Collection of Keys
  - c) Collection of Tables
  - d) Collection of Fields
- 14) Which command is used to remove a relation from an SQL?
- a) Drop table
  - b) Delete
  - c) Purge
  - d) Remove

Seat No.	
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**Fourth.Y. (B. Tech) (Sem – I) (New)(CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**Database Management System**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any three.** **12**

- a) What are different data models? Explain any one.
- b) What are the different components of DBMS?
- c) Explain in detail Entity relationship model.
- d) Explain data abstraction or 3 schema architecture.

**Q.3 Attempt any two.** **16**

- a) Explain Fundamental and additional relational algebra operations with example.
- b) Explain basic notations of ER diagrams and also explain degree of relationship.
- c) Define SQL data. What are different SQL data types explain in detail.

**Section – II**

**Q.4 Attempt any three.** **12**

- a) What is Normalization? Explain Boyce-Codd Normal Form.
- b) Explain concurrency control with locking method. Explain with example.
- c) Give comparison in between Indexing and hashing.
- d) What is Bigdata? What are the Characteristics of Bigdata?

**Q.5 Attempt any two.** **16**

- a) Write short note on conflict and view serializability.
- b) What is mean by hashing? Explain static hashing and dynamic hashing.
- c) Explain concurrency control with time stamping method. Explain with examples.

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Set	P
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics & Telecommunication Engineering**  
**Image & Video Processing**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option: 14**

- 1) Which of the following color model is suitable from the perception point of view?
 

a) RGB	b) HIS
c) CMY	d) CMYK
- 2) In frequency domain, what is the equivalent operation of product of two functions in spatial domain?
 

a) Correlation	b) Convolution
c) Fourier transform	d) Fast Fourier transform
- 3) Process that increases the dynamic range of gray levels in an image is called as \_\_\_\_\_.
 

a) Linear stretching	b) Contrast stretching
c) Contrast matching	d) All of above
- 4) Process used to correct the power law response is called as \_\_\_\_\_.
 

a) Alpha correction	b) Luminance correction
c) Gamma correction	d) None of the above
- 5) Histogram matching is also called as \_\_\_\_\_.
 

a) Histogram equalization
b) Contrast stretching
c) Histogram specification
d) None of the above
- 6) Which of the method is not related to region based segmentation?
 

a) Thresholding	b) Merging & splitting
c) Region growing	d) Hough transform
- 7) Which of the following second order operator is most robust to noise in edge filtering?
 

a) Sobel operator
b) Laplacian operator
c) Laplacian of Gaussian operator
d) Prewitt operator

- 8) Which of the following requires less number of bits for encoding?
- a) I frames
  - b) P frames
  - c) B frames
  - d) I and P frames
- 9) Which scanning method is used for Television signal
- a) Progressive
  - b) Interlaced
  - c) Progressive or interlaced
  - d) None of above
- 10) Block motion model can't handle \_\_\_\_\_ motion.
- a) Translational
  - b) Rotational
  - c) Translational and rotational
  - d) None of above
- 11) Which of the following is implementation issue of phase correlation method?
- a) Boundary effects
  - b) Spectral leakage due to non integer motion vectors
  - c) Range of displacement estimates
  - d) All of above
- 12) Which of the following is most popular method for practical motion estimation?
- a) Phase correlation method
  - b) Block motion
  - c) Block matching method
  - d) Cross search method
- 13) Which of the following is method of estimating the degradation function?
- a) Image observation
  - b) Experimentation
  - c) Mathematical modeling
  - d) All of above
- 14) Video resolution of NTSC is
- a) 720 x 576
  - b) 720 x 480
  - c) 1024 x 820
  - d) 800 x 600

Seat No.	
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Set **P**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics & Telecommunication Engineering**  
**Image & Video Processing**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:**
- 1) All Questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four of following** **16**

- a) What is RGB color model and how it can be obtained using HSI color model?
- b) What is contrast stretching of an image and how it can be achieved?
- c) What is histogram of image? What is histogram equalization?
- d) How global thresholding is used for detecting edge from an image?
- e) What are applications of Dilation and Erosion in image morphology?

**Q.3 Answer any two of following** **12**

- a) What is gray level slicing and bit plane slicing? What are its applications
- b) Equalize the given histogram of an image

Gray Levels	0	1	2	3	4	5	6	7	
No. of pixels	790	1023	850	656	329	245	122	81	

- c) How Boundary Extraction and hole filling operations are carried out?

**Section – II**

**Q.4 Answer any four of following** **16**

- a) Draw block diagram of image degradation/restoration model and explain.
- b) What are I, P & B frames in digital video?
- c) Explain interlaced scanning in video signals.
- d) What is Aperture problem in 2D motion estimation?
- e) What are implementation issues in Phase Correlation method?

**Q.5 Answer any two of following** **12**

- a) What is image restoration? How image restoration is done using Weiner filter?
- b) What are sampling structures for Digital Video?
- c) What is Block matching method for motion estimation?

Seat No.	
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Set	Q
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics & Telecommunication Engineering**  
**Image & Video Processing**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option: 14**

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a) I frames	b) P frames
c) B frames	d) I and P frames
- 2) Which scanning method is used for Television signal
 

a) Progressive	b) Interlaced
c) Progressive or interlaced	d) None of above
- 3) Block motion model can't handle \_\_\_\_\_ motion.
 

a) Translational	b) Rotational
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  - c) Laplacian of Gaussian operator
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Seat No.	
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Set **Q**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics & Telecommunication Engineering**  
**Image & Video Processing**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:**
- 1) All Questions are compulsory.
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**Section – I**

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**Q.4 Answer any four of following** **16**

- a) Draw block diagram of image degradation/restoration model and explain.
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Seat No.	
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Set	R
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics & Telecommunication Engineering**  
**Image & Video Processing**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option: 14**

- 1) Which of the following is implementation issue of phase correlation method?
  - a) Boundary effects
  - b) Spectral leakage due to non integer motion vectors
  - c) Range of displacement estimates
  - d) All of above
- 2) Which of the following is most popular method for practical motion estimation?
  - a) Phase correlation method
  - b) Block motion
  - c) Block matching method
  - d) Cross search method
- 3) Which of the following is method of estimating the degradation function?
 

a) Image observation	b) Experimentation
c) Mathematical modeling	d) All of above
- 4) Video resolution of NTSC is
 

a) 720 x 576	b) 720 x 480
c) 1024 x 820	d) 800 x 600
- 5) Which of the following color model is suitable from the perception point of view?
 

a) RGB	b) HIS
c) CMY	d) CMYK
- 6) In frequency domain, what is the equivalent operation of product of two functions in spatial domain?
 

a) Correlation	b) Convolution
c) Fourier transform	d) Fast Fourier transform
- 7) Process that increases the dynamic range of gray levels in an image is called as \_\_\_\_\_.
 

a) Linear stretching	b) Contrast stretching
c) Contrast matching	d) All of above

- 8) Process used to correct the power law response is called as \_\_\_\_\_.  
a) Alpha correction                      b) Luminance correction  
c) Gamma correction                      d) None of the above
- 9) Histogram matching is also called as \_\_\_\_\_.  
a) Histogram equalization  
b) Contrast stretching  
c) Histogram specification  
d) None of the above
- 10) Which of the method is not related to region based segmentation?  
a) Thresholding                      b) Merging & splitting  
c) Region growing                      d) Hough transform
- 11) Which of the following second order operator is most robust to noise in edge filtering?  
a) Sobel operator  
b) Laplacian operator  
c) Laplacian of Gaussian operator  
d) Prewitt operator
- 12) Which of the following requires less number of bits for encoding?  
a) I frames                      b) P frames  
c) B frames                      d) I and P frames
- 13) Which scanning method is used for Television signal  
a) Progressive                      b) Interlaced  
c) Progressive or interlaced                      d) None of above
- 14) Block motion model can't handle \_\_\_\_\_ motion.  
a) Translational                      b) Rotational  
c) Translational and rotational                      d) None of above

Seat No.	
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Set **R**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics & Telecommunication Engineering**  
**Image & Video Processing**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:**
- 1) All Questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four of following** **16**

- a) What is RGB color model and how it can be obtained using HSI color model?
- b) What is contrast stretching of an image and how it can be achieved?
- c) What is histogram of image? What is histogram equalization?
- d) How global thresholding is used for detecting edge from an image?
- e) What are applications of Dilation and Erosion in image morphology?

**Q.3 Answer any two of following** **12**

- a) What is gray level slicing and bit plane slicing? What are its applications
- b) Equalize the given histogram of an image

Gray Levels	0	1	2	3	4	5	6	7	
No. of pixels	790	1023	850	656	329	245	122	81	

- c) How Boundary Extraction and hole filling operations are carried out?

**Section – II**

**Q.4 Answer any four of following** **16**

- a) Draw block diagram of image degradation/restoration model and explain.
- b) What are I, P & B frames in digital video?
- c) Explain interlaced scanning in video signals.
- d) What is Aperture problem in 2D motion estimation?
- e) What are implementation issues in Phase Correlation method?

**Q.5 Answer any two of following** **12**

- a) What is image restoration? How image restoration is done using Weiner filter?
- b) What are sampling structures for Digital Video?
- c) What is Block matching method for motion estimation?

<b>Seat No.</b>	
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Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option:**

14

- Page 10 of 12

- 8) Which of the following is method of estimating the degradation function?  
a) Image observation                      b) Experimentation  
c) Mathematical modeling                d) All of above
- 9) Video resolution of NTSC is  
a) 720 x 576                                  b) 720 x 480  
c) 1024 x 820                                d) 800 x 600
- 10) Which of the following color model is suitable from the perception point of view?  
a) RGB                                        b) HIS  
c) CMY                                        d) CMYK
- 11) In frequency domain, what is the equivalent operation of product of two functions in spatial domain?  
a) Correlation                                b) Convolution  
c) Fourier transform                        d) Fast Fourier transform
- 12) Process that increases the dynamic range of gray levels in an image is called as \_\_\_\_\_.  
a) Linear stretching                        b) Contrast stretching  
c) Contrast matching                        d) All of above
- 13) Process used to correct the power law response is called as \_\_\_\_\_.  
a) Alpha correction                        b) Luminance correction  
c) Gamma correction                        d) None of the above
- 14) Histogram matching is also called as \_\_\_\_\_.  
a) Histogram equalization  
b) Contrast stretching  
c) Histogram specification  
d) None of the above

Seat No.	
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Set **S**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics & Telecommunication Engineering**  
**Image & Video Processing**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:**
- 1) All Questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four of following** **16**

- a) What is RGB color model and how it can be obtained using HSI color model?
- b) What is contrast stretching of an image and how it can be achieved?
- c) What is histogram of image? What is histogram equalization?
- d) How global thresholding is used for detecting edge from an image?
- e) What are applications of Dilation and Erosion in image morphology?

**Q.3 Answer any two of following** **12**

- a) What is gray level slicing and bit plane slicing? What are its applications
- b) Equalize the given histogram of an image

Gray Levels	0	1	2	3	4	5	6	7	
No. of pixels	790	1023	850	656	329	245	122	81	

- c) How Boundary Extraction and hole filling operations are carried out?

**Section – II**

**Q.4 Answer any four of following** **16**

- a) Draw block diagram of image degradation/restoration model and explain.
- b) What are I, P & B frames in digital video?
- c) Explain interlaced scanning in video signals.
- d) What is Aperture problem in 2D motion estimation?
- e) What are implementation issues in Phase Correlation method?

**Q.5 Answer any two of following** **12**

- a) What is image restoration? How image restoration is done using Weiner filter?
- b) What are sampling structures for Digital Video?
- c) What is Block matching method for motion estimation?

Seat No.	
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Set	P
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronic & Telecommunication Engineering**  
**Wireless Sensor Network**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options.**

- 1) Similarities between WSNs and MANETs networks is.
  - a) nodes are densely deployed
  - b) the nodes communicate with each other using multi-hop communication
  - c) topology changes very frequently
  - d) have global unique identification for nodes
- 2) In which network access point is not required?
  - a) ad hoc network
  - b) infrastructure network
  - c) both a and b
  - d) none of the above
- 3) As the number of nodes \_\_\_\_\_ every node spends almost all of its time forwarding packets of other nodes.
  - a) decrease
  - b) increases
  - c) constant
  - d) none of the above
- 4) In wireless sensor networks, some of the information defining the objective function and constraints is available only at \_\_\_\_\_.
  - a) compile time
  - b) run time
  - c) ideal time
  - d) setup time
- 5) Which of the following are the applications of WSN?
  - a) Health monitoring
  - b) Industrial process monitoring and control
  - c) Military
  - d) All the above
- 6) The following characteristics of wireless sensor networks point to the need for a specialized MAC protocol
  - a) the issues of fairness of the node level are much less important than overall application performance
  - b) most sensor nodes are idle much of the time
  - c) in-network processing can greatly improve bandwidth utilization
  - d) all of above



- 7) The S-MAC protocol includes the following major components
- a) periodic listen and sleep
  - b) collision avoidance
  - c) overheating avoidance
  - d) all of above
- 8) \_\_\_\_\_ assigns a unique number to each IP network adapter called the MAC address.
- a) media access control
  - b) metro access control
  - c) metropolitan access control
  - d) both b and c above
- 9) In wireless distribution system \_\_\_\_\_.
- a) multiple access points are inter-connected with each other
  - b) there is no access point
  - c) only one access point exists
  - d) access points are not required
- 10) A wireless network interface controller can work in \_\_\_\_\_
- a) infrastructure mode
  - b) ad-hoc mode
  - c) both infrastructure mode and ad-hoc mode
  - d) WDS mode
- 11) The energy source used in WSN are \_\_\_\_\_.
- a) Battery
  - b) Inverter
  - c) Capacitor
  - d) None of the above
- 12) A sensor network is designed to perform a set of high-level information processing tasks such as \_\_\_\_\_.
- a) detection
  - b) tracking
  - c) classification
  - d) All of the above
- 13) A transducer that converts a physical phenomenon that maybe further manipulated by other apparatus
- a) sensor
  - b) sensor node
  - c) Protocols
  - d) None of the above
- 14) The process of determining a network path from a packet source node to its destination.
- a) Routing
  - b) Network topology
  - c) sensor
  - d) sensor node

Seat No.	
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Set	P
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronic & Telecommunication Engineering**  
**Wireless Sensor Network**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four of the following.** **16**

- a) What are the challenges and the required mechanisms of a Wireless Sensor network?
- b) Briefly discuss the applications of WSNs.
- c) Compare MANET and WSN
- d) Explain in detail about Gateway concepts.
- e) With a neat diagram, Explain sensor network architecture
- f) Explain various clustering mechanisms in WSN.

**Q.3 Attempt any two of the following questions** **12**

- a) Write notes on
  - i) Dynamic Energy and power management
  - ii) TinyOS
- b) Explain Time Synchronization, Localization, and positioning.
- c) Explain the optimization goals and figure of merit of WSN.

**Section – II**

**Q.4 Attempt any four of the following** **16**

- a) What are the Issues and Challenges in providing QoS in WSN?
- b) Discuss the characteristic requirements of WSN.
- c) Differentiate between contention-based protocols and schedule-based protocols
- d) Explain how the sensor networks are deployed for various applications.
- e) Define clustering and explain in detail its types.
- f) What is the need for energy management?

**Q.5 Attempt any two of the following questions** **12**

- a) Explain Energy Consumption of Sensor Nodes.
- b) Explain any two applications of a wireless sensor network in detail.
- c) What are the Enabling Technologies for Wireless Sensor Networks?

Seat No.	
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Set Q
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronic & Telecommunication Engineering**  
**Wireless Sensor Network**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options.**

- 1) \_\_\_\_\_ assigns a unique number to each IP network adapter called the MAC address.
  - a) media access control
  - b) metro access control
  - c) metropolitan access control
  - d) both b and c above
- 2) In wireless distribution system \_\_\_\_\_.
  - a) multiple access points are inter-connected with each other
  - b) there is no access point
  - c) only one access point exists
  - d) access points are not required
- 3) A wireless network interface controller can work in \_\_\_\_\_.
  - a) infrastructure mode
  - b) ad-hoc mode
  - c) both infrastructure mode and ad-hoc mode
  - d) WDS mode
- 4) The energy source used in WSN are \_\_\_\_\_.
  - a) Battery
  - b) Inverter
  - c) Capacitor
  - d) None of the above
- 5) A sensor network is designed to perform a set of high-level information processing tasks such as \_\_\_\_\_.
  - a) detection
  - b) tracking
  - c) classification
  - d) All of the above
- 6) A transducer that converts a physical phenomenon that maybe further manipulated by other apparatus
  - a) sensor
  - b) sensor node
  - c) Protocols
  - d) None of the above
- 7) The process of determining a network path from a packet source node to its destination.
  - a) Routing
  - b) Network topology
  - c) sensor
  - d) sensor node

- 8) Similarities between WSNs and MANETs networks is.
- a) nodes are densely deployed
  - b) the nodes communicate with each other using multi-hop communication
  - c) topology changes very frequently
  - d) have global unique identification for nodes
- 9) In which network access point is not required?
- a) ad hoc network
  - b) infrastructure network
  - c) both a and b
  - d) none of the above
- 10) As the number of nodes \_\_\_\_\_ every node spends almost all of its time forwarding packets of other nodes.
- a) decrease
  - b) increases
  - c) constant
  - d) none of the above
- 11) In wireless sensor networks, some of the information defining the objective function and constraints is available only at \_\_\_\_\_.
- a) compile time
  - b) run time
  - c) ideal time
  - d) setup time
- 12) Which of the following are the applications of WSN?
- a) Health monitoring
  - b) Industrial process monitoring and control
  - c) Military
  - d) All the above
- 13) The following characteristics of wireless sensor networks point to the need for a specialized MAC protocol
- a) the issues of fairness of the node level are much less important than overall application performance
  - b) most sensor nodes are idle much of the time
  - c) in-network processing can greatly improve bandwidth utilization
  - d) all of above
- 14) The S-MAC protocol includes the following major components
- a) periodic listen and sleep
  - b) collision avoidance
  - c) overheating avoidance
  - d) all of above

Seat No.	
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Set 

Q
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronic & Telecommunication Engineering**  
**Wireless Sensor Network**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four of the following.** **16**

- a) What are the challenges and the required mechanisms of a Wireless Sensor network?
- b) Briefly discuss the applications of WSNs.
- c) Compare MANET and WSN
- d) Explain in detail about Gateway concepts.
- e) With a neat diagram, Explain sensor network architecture
- f) Explain various clustering mechanisms in WSN.

**Q.3 Attempt any two of the following questions** **12**

- a) Write notes on
  - i) Dynamic Energy and power management
  - ii) TinyOS
- b) Explain Time Synchronization, Localization, and positioning.
- c) Explain the optimization goals and figure of merit of WSN.

**Section – II**

**Q.4 Attempt any four of the following** **16**

- a) What are the Issues and Challenges in providing QoS in WSN?
- b) Discuss the characteristic requirements of WSN.
- c) Differentiate between contention-based protocols and schedule-based protocols
- d) Explain how the sensor networks are deployed for various applications.
- e) Define clustering and explain in detail its types.
- f) What is the need for energy management?

**Q.5 Attempt any two of the following questions** **12**

- a) Explain Energy Consumption of Sensor Nodes.
- b) Explain any two applications of a wireless sensor network in detail.
- c) What are the Enabling Technologies for Wireless Sensor Networks?

<b>Seat No.</b>	
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- 8) In wireless sensor networks, some of the information defining the objective function and constraints is available only at \_\_\_\_\_.
  - a) compile time
  - b) run time
  - c) ideal time
  - d) setup time
- 9) Which of the following are the applications of WSN?
  - a) Health monitoring
  - b) Industrial process monitoring and control
  - c) Military
  - d) All the above
- 10) The following characteristics of wireless sensor networks point to the need for a specialized MAC protocol
  - a) the issues of fairness of the node level are much less important than overall application performance
  - b) most sensor nodes are idle much of the time
  - c) in-network processing can greatly improve bandwidth utilization
  - d) all of above
- 11) The S-MAC protocol includes the following major components
  - a) periodic listen and sleep
  - b) collision avoidance
  - c) overheating avoidance
  - d) all of above
- 12) \_\_\_\_\_ assigns a unique number to each IP network adapter called the MAC address.
  - a) media access control
  - b) metro access control
  - c) metropolitan access control
  - d) both b and c above
- 13) In wireless distribution system \_\_\_\_\_.
  - a) multiple access points are inter-connected with each other
  - b) there is no access point
  - c) only one access point exists
  - d) access points are not required
- 14) A wireless network interface controller can work in \_\_\_\_\_.
  - a) infrastructure mode
  - b) ad-hoc mode
  - c) both infrastructure mode and ad-hoc mode
  - d) WDS mode

Seat No.	
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Set 

R
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**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronic & Telecommunication Engineering**  
**Wireless Sensor Network**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four of the following.** **16**

- a) What are the challenges and the required mechanisms of a Wireless Sensor network?
- b) Briefly discuss the applications of WSNs.
- c) Compare MANET and WSN
- d) Explain in detail about Gateway concepts.
- e) With a neat diagram, Explain sensor network architecture
- f) Explain various clustering mechanisms in WSN.

**Q.3 Attempt any two of the following questions** **12**

- a) Write notes on
  - i) Dynamic Energy and power management
  - ii) TinyOS
- b) Explain Time Synchronization, Localization, and positioning.
- c) Explain the optimization goals and figure of merit of WSN.

**Section – II**

**Q.4 Attempt any four of the following** **16**

- a) What are the Issues and Challenges in providing QoS in WSN?
- b) Discuss the characteristic requirements of WSN.
- c) Differentiate between contention-based protocols and schedule-based protocols
- d) Explain how the sensor networks are deployed for various applications.
- e) Define clustering and explain in detail its types.
- f) What is the need for energy management?

**Q.5 Attempt any two of the following questions** **12**

- a) Explain Energy Consumption of Sensor Nodes.
- b) Explain any two applications of a wireless sensor network in detail.
- c) What are the Enabling Technologies for Wireless Sensor Networks?



Seat No.	
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Set **S**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronic & Telecommunication Engineering**  
**Wireless Sensor Network**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 70

**Q.1 Choose the correct alternatives from the options.**

- 1) The following characteristics of wireless sensor networks point to the need for a specialized MAC protocol
  - a) the issues of fairness of the node level are much less important than overall application performance
  - b) most sensor nodes are idle much of the time
  - c) in-network processing can greatly improve bandwidth utilization
  - d) all of above
- 2) The S-MAC protocol includes the following major components
  - a) periodic listen and sleep
  - b) collision avoidance
  - c) overheating avoidance
  - d) all of above
- 3) \_\_\_\_\_ assigns a unique number to each IP network adapter called the MAC address.
  - a) media access control
  - b) metro access control
  - c) metropolitan access control
  - d) both b and c above
- 4) In wireless distribution system \_\_\_\_\_.
  - a) multiple access points are inter-connected with each other
  - b) there is no access point
  - c) only one access point exists
  - d) access points are not required
- 5) A wireless network interface controller can work in \_\_\_\_\_.
  - a) infrastructure mode
  - b) ad-hoc mode
  - c) both infrastructure mode and ad-hoc mode
  - d) WDS mode
- 6) The energy source used in WSN are \_\_\_\_\_.
  - a) Battery
  - b) Inverter
  - c) Capacitor
  - d) None of the above



Seat No.	
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Set **S**

**Fourth Year (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronic & Telecommunication Engineering**  
**Wireless Sensor Network**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four of the following.** **16**

- a) What are the challenges and the required mechanisms of a Wireless Sensor network?
- b) Briefly discuss the applications of WSNs.
- c) Compare MANET and WSN
- d) Explain in detail about Gateway concepts.
- e) With a neat diagram, Explain sensor network architecture
- f) Explain various clustering mechanisms in WSN.

**Q.3 Attempt any two of the following questions** **12**

- a) Write notes on
  - i) Dynamic Energy and power management
  - ii) TinyOS
- b) Explain Time Synchronization, Localization, and positioning.
- c) Explain the optimization goals and figure of merit of WSN.

**Section – II**

**Q.4 Attempt any four of the following** **16**

- a) What are the Issues and Challenges in providing QoS in WSN?
- b) Discuss the characteristic requirements of WSN.
- c) Differentiate between contention-based protocols and schedule-based protocols
- d) Explain how the sensor networks are deployed for various applications.
- e) Define clustering and explain in detail its types.
- f) What is the need for energy management?

**Q.5 Attempt any two of the following questions** **12**

- a) Explain Energy Consumption of Sensor Nodes.
- b) Explain any two applications of a wireless sensor network in detail.
- c) What are the Enabling Technologies for Wireless Sensor Networks?

Seat No.	
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Set	P
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microwave Engineering**

Day & Date: Tuesday, 14-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. Don't forget to mention Q.P. Set (P, Q, R, S) on top of page.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) Which TM mode in rectangular waveguide has lowest cut off frequency?
  - a) TM<sub>11</sub>
  - b) TM<sub>01</sub>
  - c) TM<sub>10</sub>
  - d) TM<sub>21</sub>
- 2) The modes in a reflex Klystron
  - a) Give the same frequency but different transit times
  - b) Result from excessive transit time across the resonator gap
  - c) Are caused by spurious frequency modulation
  - d) Are just for theoretical consideration
- 3) The ratio of magnitudes of electric field intensity to the magnetic field intensity is regarded as
 

a) Characteristic impedance	b) Intrinsic impedance
c) Both a and b	d) None of these
- 4) Which one of the following is a transferred electron device?
 

a) Gunn diode	b) Tunnel diode
c) IMPATT diode	d) PIN diode
- 5) The losses that occur in a transmission line is:
 

a) Conduction losses	b) Di-electric loss
c) Both of the mentioned	d) none of the mentioned
- 6) The maximum theoretical efficiency of two cavity klystron is
 

a) 22%	b) 58%
c) 85%	d) 48%
- 7) In case of Magnetron frequency pushing takes place due to \_\_\_\_\_ variations.
 

a) Supply	b) Load
c) Frequency	d) Amplitude

- 8) The characteristic impedance of a parallel plate waveguide is given by:
- a)  $\eta \cdot D/W$
  - b)  $\eta \cdot W/D$
  - c)  $D/\eta \cdot W$
  - d)  $\eta \cdot \sqrt{D/W}$
- 9) The modes of propagation supported by a rectangular wave guide is:
- a) TM, TEM, TE modes
  - b) TM, TE
  - c) TM, TEM
  - d) TE, TEM
- 10) Dominant mode is defined as:
- a) Any TEM mode is called a dominant mode
  - b) Mode with the highest cut off frequency
  - c) Mode with the lowest cut off frequency
  - d) None of the mentioned
- 11) S parameters are expressed as a ratio of:
- a) Voltage and current
  - b) Impedance at different ports
  - c) Incident and the reflected voltage waves
  - d) None of the mentioned
- 12) Ferrite isolators are \_\_\_\_\_ port microwave devices.
- a) Two
  - b) Three
  - c) Four
  - d) None of the mentioned
- 13) Micro strip can be fabricated using:
- a) Photo lithographic process
  - b) Electrochemical process
  - c) Mechanical methods
  - d) none of the mentioned
- 14) Microstrip line can support a pure TEM wave
- a) True
  - b) False
  - c) Microstrip supports only TM mode
  - d) Microstrip supports only TE mode

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**Set P**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microwave Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- a) Derive the expression for field components of TM mode in rectangular waveguide.
- b) Explain working of two-hole Directional Coupler.
- c) What is the purpose of slow wave structures used in TWT amplifiers?
- d) Define the following terms
  - a) S Matrix
  - b) Radiation efficiency
  - c) VSWR
  - d) Isolator
- e) Justify the characteristic impedance of transmission line remains constant through line.

**Q.3 Attempt any Two of the following question. 12**

- a) Why tee is called as magic tee? Derive expression for scattering matrix. Also, explain how unknown impedance is measured using magic tee.
- b) Derive S matrix for E plane tee. Justify the statement "E plane tee acts as a 3 dB splitter".
- c) Determine the cut-off wavelength for the dominant mode in a rectangular waveguide of breadth 12 cms. For 2 GHz signal propagated in this waveguide in the dominant mode calculate the guide wavelength in the dominant mode, group, and phase velocities

**Section – II**

**Q.4 Write a note on any Four of the following. 16**

- a) What is Gunn effect? Explain how negative resistance is to be achieved in Gunn diode.
- b) Derive the relation between repeller voltage and the accelerating voltage for reflex Klystron.
- c) Explain any one method for measurement of VSWR.
- d) Explain the two-cavity klystron amplifier with neat diagram.
- e) How do you measure microwave frequency?

**Q.5 Write a note on any Two of the following.**

- a)** Derive velocity modulation, transit time of reflex klystron oscillator.
- b)** Two cavity klystron amplifier has following parameters Anode to cathode voltage = 1000 V  
Beam current = 20 mA  
Frequency = 4 GHz  
Gap spacing in either cavity = 1 mm  
Spacing between two cavities = 2 cm  
Effective shunt impedance = 20 kohm (Excluding beam loading)  
Calculate:
  - i) Electron velocity
  - ii) Input gap voltage to give maximum voltage across input cavity
  - iii) Voltage Gain in decibels
- c)** Explain any two methods for measurement of wavelength and frequency using slotted line method.

Seat No.	
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Set Q
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microwave Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. Don't forget to mention Q.P. Set (P, Q, R, S) on top of page.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) The characteristic impedance of a parallel plate waveguide is given by:
  - a)  $\eta \cdot D/W$
  - b)  $\eta \cdot W/D$
  - c)  $D/\eta \cdot W$
  - d)  $\eta \cdot \sqrt{D/W}$
- 2) The modes of propagation supported by a rectangular wave guide is:
  - a) TM, TEM, TE modes
  - b) TM, TE
  - c) TM, TEM
  - d) TE, TEM
- 3) Dominant mode is defined as:
  - a) Any TEM mode is called a dominant mode
  - b) Mode with the highest cut off frequency
  - c) Mode with the lowest cut off frequency
  - d) None of the mentioned
- 4) S parameters are expressed as a ratio of:
  - a) Voltage and current
  - b) Impedance at different ports
  - c) Incident and the reflected voltage waves
  - d) None of the mentioned
- 5) Ferrite isolators are \_\_\_\_\_ port microwave devices.
  - a) Two
  - b) Three
  - c) Four
  - d) None of the mentioned
- 6) Micro strip can be fabricated using:
  - a) Photo lithographic process
  - b) Electrochemical process
  - c) Mechanical methods
  - d) none of the mentioned
- 7) Microstrip line can support a pure TEM wave
  - a) True
  - b) False
  - c) Microstrip supports only TM mode
  - d) Microstrip supports only TE mode



- 8) Which TM mode in rectangular waveguide has lowest cut off frequency?
- a) TM<sub>11</sub>
  - b) TM<sub>01</sub>
  - c) TM<sub>10</sub>
  - d) TM<sub>21</sub>
- 9) The modes in a reflex Klystron
- a) Give the same frequency but different transit times
  - b) Result from excessive transit time across the resonator gap
  - c) Are caused by spurious frequency modulation
  - d) Are just for theoretical consideration
- 10) The ratio of magnitudes of electric field intensity to the magnetic field intensity is regarded as
- a) Characteristic impedance
  - b) Intrinsic impedance
  - c) Both a and b
  - d) None of these
- 11) Which one of the following is a transferred electron device?
- a) Gunn diode
  - b) Tunnel diode
  - c) IMPATT diode
  - d) PIN diode
- 12) The losses that occur in a transmission line is:
- a) Conduction losses
  - b) Di-electric loss
  - c) Both of the mentioned
  - d) none of the mentioned
- 13) The maximum theoretical efficiency of two cavity klystron is
- a) 22%
  - b) 58%
  - c) 85%
  - d) 48%
- 14) In case of Magnetron frequency pushing takes place due to \_\_\_\_\_ variations.
- a) Supply
  - b) Load
  - c) Frequency
  - d) Amplitude

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microwave Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- Derive the expression for field components of TM mode in rectangular waveguide.
- Explain working of two-hole Directional Coupler.
- What is the purpose of slow wave structures used in TWT amplifiers?
- Define the following terms
  - S Matrix
  - Radiation efficiency
  - VSWR
  - Isolator
- Justify the characteristic impedance of transmission line remains constant through line.

**Q.3 Attempt any Two of the following question. 12**

- Why tee is called as magic tee? Derive expression for scattering matrix. Also, explain how unknown impedance is measured using magic tee.
- Derive S matrix for E plane tee. Justify the statement "E plane tee acts as a 3 dB splitter".
- Determine the cut-off wavelength for the dominant mode in a rectangular waveguide of breadth 12 cms. For 2 GHz signal propagated in this waveguide in the dominant mode calculate the guide wavelength in the dominant mode, group, and phase velocities

**Section – II**

**Q.4 Write a note on any Four of the following. 16**

- What is Gunn effect? Explain how negative resistance is to be achieved in Gunn diode.
- Derive the relation between repeller voltage and the accelerating voltage for reflex Klystron.
- Explain any one method for measurement of VSWR.
- Explain the two-cavity klystron amplifier with neat diagram.
- How do you measure microwave frequency?

**Q.5 Write a note on any Two of the following.**

- a)** Derive velocity modulation, transit time of reflex klystron oscillator.
- b)** Two cavity klystron amplifier has following parameters Anode to cathode voltage = 1000 V  
Beam current = 20 mA  
Frequency = 4 GHz  
Gap spacing in either cavity = 1 mm  
Spacing between two cavities = 2 cm  
Effective shunt impedance = 20 kohm (Excluding beam loading)  
Calculate:
  - i) Electron velocity
  - ii) Input gap voltage to give maximum voltage across input cavity
  - iii) Voltage Gain in decibels
- c)** Explain any two methods for measurement of wavelength and frequency using slotted line method.

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microwave Engineering**

Day & Date: Tuesday, 14-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. Don't forget to mention Q.P. Set (P, Q, R, S) on top of page.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) S parameters are expressed as a ratio of:
  - a) Voltage and current
  - b) Impedance at different ports
  - c) Incident and the reflected voltage waves
  - d) None of the mentioned
- 2) Ferrite isolators are \_\_\_\_\_ port microwave devices.
  - a) Two
  - b) Three
  - c) Four
  - d) None of the mentioned
- 3) Micro strip can be fabricated using:
  - a) Photo lithographic process
  - b) Electrochemical process
  - c) Mechanical methods
  - d) none of the mentioned
- 4) Microstrip line can support a pure TEM wave
  - a) True
  - b) False
  - c) Microstrip supports only TM mode
  - d) Microstrip supports only TE mode
- 5) Which TM mode in rectangular waveguide has lowest cut off frequency?
  - a) TM<sub>11</sub>
  - b) TM<sub>01</sub>
  - c) TM<sub>10</sub>
  - d) TM<sub>21</sub>
- 6) The modes in a reflex Klystron
  - a) Give the same frequency but different transit times
  - b) Result from excessive transit time across the resonator gap
  - c) Are caused by spurious frequency modulation
  - d) Are just for theoretical consideration
- 7) The ratio of magnitudes of electric field intensity to the magnetic field intensity is regarded as
  - a) Characteristic impedance
  - b) Intrinsic impedance
  - c) Both a and b
  - d) None of these



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Set **R**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microwave Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- a) Derive the expression for field components of TM mode in rectangular waveguide.
- b) Explain working of two-hole Directional Coupler.
- c) What is the purpose of slow wave structures used in TWT amplifiers?
- d) Define the following terms
 

a) S Matrix	b) Radiation efficiency
c) VSWR	d) Isolator
- e) Justify the characteristic impedance of transmission line remains constant through line.

**Q.3 Attempt any Two of the following question. 12**

- a) Why tee is called as magic tee? Derive expression for scattering matrix. Also, explain how unknown impedance is measured using magic tee.
- b) Derive S matrix for E plane tee. Justify the statement "E plane tee acts as a 3 dB splitter".
- c) Determine the cut-off wavelength for the dominant mode in a rectangular waveguide of breadth 12 cms. For 2 GHz signal propagated in this waveguide in the dominant mode calculate the guide wavelength in the dominant mode, group, and phase velocities

**Section – II**

**Q.4 Write a note on any Four of the following. 16**

- a) What is Gunn effect? Explain how negative resistance is to be achieved in Gunn diode.
- b) Derive the relation between repeller voltage and the accelerating voltage for reflex Klystron.
- c) Explain any one method for measurement of VSWR.
- d) Explain the two-cavity klystron amplifier with neat diagram.
- e) How do you measure microwave frequency?

**Q.5 Write a note on any Two of the following.**

- a)** Derive velocity modulation, transit time of reflex klystron oscillator.
- b)** Two cavity klystron amplifier has following parameters Anode to cathode voltage = 1000 V  
Beam current = 20 mA  
Frequency = 4 GHz  
Gap spacing in either cavity = 1 mm  
Spacing between two cavities = 2 cm  
Effective shunt impedance = 20 kohm (Excluding beam loading)  
Calculate:
  - i) Electron velocity
  - ii) Input gap voltage to give maximum voltage across input cavity
  - iii) Voltage Gain in decibels
- c)** Explain any two methods for measurement of wavelength and frequency using slotted line method.

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microwave Engineering**

Day & Date: Tuesday, 14-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. Don't forget to mention Q.P. Set (P, Q, R, S) on top of page.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) The maximum theoretical efficiency of two cavity klystron is
 

a) 22%	b) 58%
c) 85%	d) 48%
- 2) In case of Magnetron frequency pushing takes place due to \_\_\_\_\_ variations.
 

a) Supply	b) Load
c) Frequency	d) Amplitude
- 3) The characteristic impedance of a parallel plate waveguide is given by:
 

a) $\eta \cdot D/W$	b) $\eta \cdot W/D$
c) $D/\eta \cdot W$	d) $\eta \cdot \sqrt{D/W}$
- 4) The modes of propagation supported by a rectangular wave guide is:
 

a) TM, TEM, TE modes	b) TM, TE
c) TM, TEM	d) TE, TEM
- 5) Dominant mode is defined as:
 

a) Any TEM mode is called a dominant mode
b) Mode with the highest cut off frequency
c) Mode with the lowest cut off frequency
d) None of the mentioned
- 6) S parameters are expressed as a ratio of:
 

a) Voltage and current
b) Impedance at different ports
c) Incident and the reflected voltage waves
d) None of the mentioned
- 7) Ferrite isolators are \_\_\_\_\_ port microwave devices.
 

a) Two	b) Three
c) Four	d) None of the mentioned
- 8) Micro strip can be fabricated using:
 

a) Photo lithographic process	b) Electrochemical process
c) Mechanical methods	d) none of the mentioned





<b>Seat No.</b>	
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Microwave Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- a) Derive the expression for field components of TM mode in rectangular waveguide.
- b) Explain working of two-hole Directional Coupler.
- c) What is the purpose of slow wave structures used in TWT amplifiers?
- d) Define the following terms
  - a) S Matrix
  - b) Radiation efficiency
  - c) VSWR
  - d) Isolator
- e) Justify the characteristic impedance of transmission line remains constant through line.

**Q.3 Attempt any Two of the following question. 12**

- a) Why tee is called as magic tee? Derive expression for scattering matrix. Also, explain how unknown impedance is measured using magic tee.
- b) Derive S matrix for E plane tee. Justify the statement "E plane tee acts as a 3 dB splitter".
- c) Determine the cut-off wavelength for the dominant mode in a rectangular waveguide of breadth 12 cms. For 2 GHz signal propagated in this waveguide in the dominant mode calculate the guide wavelength in the dominant mode, group, and phase velocities

**Section – II**

**Q.4 Write a note on any Four of the following. 16**

- a) What is Gunn effect? Explain how negative resistance is to be achieved in Gunn diode.
- b) Derive the relation between repeller voltage and the accelerating voltage for reflex Klystron.
- c) Explain any one method for measurement of VSWR.
- d) Explain the two-cavity klystron amplifier with neat diagram.
- e) How do you measure microwave frequency?

**Q.5 Write a note on any Two of the following.**

- a)** Derive velocity modulation, transit time of reflex klystron oscillator.
- b)** Two cavity klystron amplifier has following parameters Anode to cathode voltage = 1000 V  
Beam current = 20 mA  
Frequency = 4 GHz  
Gap spacing in either cavity = 1 mm  
Spacing between two cavities = 2 cm  
Effective shunt impedance = 20 kohm (Excluding beam loading)  
Calculate:
  - i) Electron velocity
  - ii) Input gap voltage to give maximum voltage across input cavity
  - iii) Voltage Gain in decibels
- c)** Explain any two methods for measurement of wavelength and frequency using slotted line method.

Seat No.	
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Set **P**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume suitable data if required and state it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) For n-MOS to operate in inversion mode, which of the following condition is true.
 

a) $V_{GS} < V_T$	b) $V_{GS} = V_T$
c) $V_{GS} > V_T$	d) None
- 2) Which of the following power dissipation is smallest for CMOS inverter?
 

a) Static	b) Dynamic
c) Short circuit	d) None
- 3) If frequency of input to CMOS inverter is doubled keeping other parameters same, what will be effect on dynamic power dissipation?
 

a) It is uncharged	b) It will be doubled
c) It will be four times	d) It will be eight times
- 4) Static CMOS design of  $Y=A \text{ XOR } B$  requires \_\_\_\_\_ number of NMOS & \_\_\_\_\_ number of PMOS transistors.
 

a) 4,4	b) 6,6
c) 8,8	d) 2,2
- 5) For N input dynamic gate, it requires \_\_\_\_\_ number of MOS transistors.
 

a) N	b) N+1
c) 2N	d) N+2
- 6) For CMOS layout, which of the following layer is used for gate?
 

a) P <sup>+</sup> diffusion	b) N <sup>+</sup> diffusion
c) Polysilicon	d) Metal-1
- 7) For four input dynamic NAND gate, which of the following parameter is zero?
 

a) $N_{MH}$	b) $N_{ML}$
c) $t_{PHL}$	d) $t_{PLH}$
- 8) For positive edge triggered register, which sequence of cascading the latches is correct?
 

a) positive, negative	b) negative, positive
c) negative, negative	d) positive, positive

- 9) For SR flipflop using NAND gates, which of the condition of S R inputs is forbidden?
- a) 0,0
  - b) 0,1
  - c) 1,0
  - d) 1,1
- 10) A C<sup>2</sup>MOS register with CLK-CLK' clocking is insensitive to \_\_\_\_\_ overlap, as long as the rise and fall times of the clock edges are sufficiently small.
- a) (0,0)
  - b) (1,1)
  - c) (0,0) & (1,1)
  - d) None
- 11) Clock skew is caused by static mismatches in the \_\_\_\_\_ paths and differences in the \_\_\_\_\_ load.
- a) Ground, Vcc
  - b) Vcc, ground
  - c) Signal, Vcc
  - d) Clock, clock
- 12) Which of the following statement is false
- a) Clock skew does not result in clock period variation
  - b) Clock jitter produces variation in clock period
  - c) Clock skew produces variation in clock period
  - d) None
- 13) Ripple carry adders has a performance that is \_\_\_\_\_ proportional to the number of bits
- a) Linearly
  - b) Square
  - c) Square root
  - d) Logarithmic
- 14) Which of the following statement is wrong?
- a) Low voltage operation around 1.0 V or below is one of the solutions being employed in state of the art memories
  - b) Memory cell should be designed so that a maximum signal is obtained in a minimum area
  - c) A memory must operate correctly over a variety of operating and manufacturing condition
  - d) None

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Draw structure of n channel Enhancement MOSFET. What is Accumulation, depletion & inversion modes?
- b) What is static power dissipation of CMOS inverter?
- c) Draw stick diagram of two input NOR gate.
- d) Draw layout of two input CMOS AND gate.
- e) Design half subtractor using complimentary CMOS logic.
- f) What is pass transistor logic? Design two input XNOR gate using this logic.

**Q.3 Attempt any two.** **12**

- a) What is DC characteristic of CMOS inverter? How it is affected by Bn/Bp ratio? What are various regions of this DC characteristic?
- b) What is dynamic CMOS logic? Draw and analyze three input XOR gate using this logic.
- c) What are issues in design of dynamic CMOS logic and how to overcome them?

**Section – II**

**Q.4 Attempt any four.** **16**

- a) What is bistability principle? Draw and explain positive latch using transmission gates & inverters.
- b) What are problems in designing low voltage static latch? How these problems are resolved?
- c) What is Asynchronous interconnect? Explain in detail.
- d) How PLL can be used for clock synchronization?
- e) Draw any one structure for 4 bit full adder and explain.
- f) Draw and explain 4 x 4 ROM cell.

**Q.5 Attempt any two.** **12**

- a) What are sources of clock skew & jitter? Explain in detail.
- b) What is necessity of TSPCR? Draw & explain positive edge triggered register in TSPC.
- c) What are problems in ripple carry adders? Draw any one structure of fast full adder and explain.

<b>Seat No.</b>	
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**Set Q**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) For positive edge triggered register, which sequence of cascading the latches is correct?
 

a) positive, negative	b) negative, positive
c) negative, negative	d) positive, positive
- 2) For SR flipflop using NAND gates, which of the condition of S R inputs is forbidden?
 

a) 0,0	b) 0,1
c) 1,0	d) 1,1
- 3) A C<sup>2</sup>MOS register with CLK-CLK' clocking is insensitive to \_\_\_\_\_ overlap, as long as the rise and fall times of the clock edges are sufficiently small.
 

a) (0,0)	b) (1,1)
c) (0,0) & (1,1)	d) None
- 4) Clock skew is caused by static mismatches in the \_\_\_\_\_ paths and differences in the \_\_\_\_\_ load.
 

a) Ground, Vcc	b) Vcc, ground
c) Signal, Vcc	d) Clock, clock
- 5) Which of the following statement is false
 

a) Clock skew does not result in clock period variation
b) Clock jitter produces variation in clock period
c) Clock skew produces variation in clock period
d) None
- 6) Ripple carry adders has a performance that is \_\_\_\_\_ proportional to the number of bits
 

a) Linearly	b) Square
c) Square root	d) Logarithmic

- 7) Which of the following statement is wrong?
- Low voltage operation around 1.0 V or below is one of the solutions being employed in state of the art memories
  - Memory cell should be designed so that a maximum signal is obtained in a minimum area
  - A memory must operate correctly over a variety of operating and manufacturing condition
  - None
- 8) For n-MOS to operate in inversion mode, which of the following condition is true.
- $V_{GS} < V_T$
  - $V_{GS} = V_T$
  - $V_{GS} > V_T$
  - None
- 9) Which of the following power dissipation is smallest for CMOS inverter?
- Static
  - Dynamic
  - Short circuit
  - None
- 10) If frequency of input to CMOS inverter is doubled keeping other parameters same, what will be effect on dynamic power dissipation?
- It is unchanged
  - It will be doubled
  - It will be four times
  - It will be eight times
- 11) Static CMOS design of  $Y=A \text{ XOR } B$  requires \_\_\_\_\_ number of NMOS & \_\_\_\_\_ number of PMOS transistors.
- 4,4
  - 6,6
  - 8,8
  - 2,2
- 12) For N input dynamic gate, it requires \_\_\_\_\_ number of MOS transistors.
- N
  - N+1
  - 2N
  - N+2
- 13) For CMOS layout, which of the following layer is used for gate?
- P<sup>+</sup> diffusion
  - N<sup>+</sup> diffusion
  - Polysilicon
  - Metal-1
- 14) For four input dynamic NAND gate, which of the following parameter is zero?
- $N_{MH}$
  - $N_{ML}$
  - $t_{PHL}$
  - $t_{PLH}$



<b>Seat No.</b>	
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Draw structure of n channel Enhancement MOSFET. What is Accumulation, depletion & inversion modes?
- b) What is static power dissipation of CMOS inverter?
- c) Draw stick diagram of two input NOR gate.
- d) Draw layout of two input CMOS AND gate.
- e) Design half subtractor using complimentary CMOS logic.
- f) What is pass transistor logic? Design two input XNOR gate using this logic.

**Q.3 Attempt any two.** **12**

- a) What is DC characteristic of CMOS inverter? How it is affected by Bn/Bp ratio? What are various regions of this DC characteristic?
- b) What is dynamic CMOS logic? Draw and analyze three input XOR gate using this logic.
- c) What are issues in design of dynamic CMOS logic and how to overcome them?

**Section – II**

**Q.4 Attempt any four.** **16**

- a) What is bistability principle? Draw and explain positive latch using transmission gates & inverters.
- b) What are problems in designing low voltage static latch? How these problems are resolved?
- c) What is Asynchronous interconnect? Explain in detail.
- d) How PLL can be used for clock synchronization?
- e) Draw any one structure for 4 bit full adder and explain.
- f) Draw and explain 4 x 4 ROM cell.

**Q.5 Attempt any two.** **12**

- a) What are sources of clock skew & jitter? Explain in detail.
- b) What is necessity of TSPCR? Draw & explain positive edge triggered register in TSPC.
- c) What are problems in ripple carry adders? Draw any one structure of fast full adder and explain.

Seat No.	
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Set **R**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume suitable data if required and state it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Clock skew is caused by static mismatches in the \_\_\_\_\_ paths and differences in the \_\_\_\_\_ load.
 

a) Ground, Vcc	b) Vcc, ground
c) Signal, Vcc	d) Clock, clock
- 2) Which of the following statement is false
 

a) Clock skew does not result in clock period variation
b) Clock jitter produces variation in clock period
c) Clock skew produces variation in clock period
d) None
- 3) Ripple carry adders has a performance that is \_\_\_\_\_ proportional to the number of bits
 

a) Linearly	b) Square
c) Square root	d) Logarithmic
- 4) Which of the following statement is wrong?
 

a) Low voltage operation around 1.0 V or below is one of the solutions being employed in state if the art memories
b) Memory cell should be designed so that a maximum signal is obtained in a minimum area
c) A memory must operate correctly over a variety of operating and manufacturing condition
d) None
- 5) For n-MOS to operate in inversion mode, which of the following condition is true.
 

a) $V_{GS} < V_T$	b) $V_{GS} = V_T$
c) $V_{GS} > V_T$	d) None
- 6) Which of the following power dissipation is smallest for CMOS inverter?
 

a) Static	b) Dynamic
c) Short circuit	d) None
- 7) If frequency of input to CMOS inverter is doubled keeping other parameters same, what will be effect on dynamic power dissipation?
 

a) It is uncharged	b) It will be doubled
c) It will be four times	d) It will be eight times

- 8) Static CMOS design of  $Y=A \text{ XOR } B$  requires \_\_\_\_\_ number of NMOS & \_\_\_\_\_ number of PMOS transistors.
- |        |        |
|--------|--------|
| a) 4,4 | b) 6,6 |
| c) 8,8 | d) 2,2 |
- 9) For N input dynamic gate, it requires \_\_\_\_\_ number of MOS transistors.
- |       |        |
|-------|--------|
| a) N  | b) N+1 |
| c) 2N | d) N+2 |
- 10) For CMOS layout, which of the following layer is used for gate?
- |                             |                             |
|-----------------------------|-----------------------------|
| a) P <sup>+</sup> diffusion | b) N <sup>+</sup> diffusion |
| c) Polysilicon              | d) Metal-1                  |
- 11) For four input dynamic NAND gate, which of the following parameter is zero?
- |              |              |
|--------------|--------------|
| a) $N_{MH}$  | b) $N_{ML}$  |
| c) $t_{PHL}$ | d) $t_{PLH}$ |
- 12) For positive edge triggered register, which sequence of cascading the latches is correct?
- |                       |                       |
|-----------------------|-----------------------|
| a) positive, negative | b) negative, positive |
| c) negative, negative | d) positive, positive |
- 13) For SR flipflop using NAND gates, which of the condition of S R inputs is forbidden?
- |        |        |
|--------|--------|
| a) 0,0 | b) 0,1 |
| c) 1,0 | d) 1,1 |
- 14) A C<sup>2</sup>MOS register with CLK-CLK' clocking is insensitive to \_\_\_\_\_ overlap, as long as the rise and fall times of the clock edges are sufficiently small.
- |                  |          |
|------------------|----------|
| a) (0,0)         | b) (1,1) |
| c) (0,0) & (1,1) | d) None  |

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<b>Set</b>	<b>R</b>
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Thursday, 16-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Draw structure of n channel Enhancement MOSFET. What is Accumulation, depletion & inversion modes?
- b) What is static power dissipation of CMOS inverter?
- c) Draw stick diagram of two input NOR gate.
- d) Draw layout of two input CMOS AND gate.
- e) Design half subtractor using complimentary CMOS logic.
- f) What is pass transistor logic? Design two input XNOR gate using this logic.

**Q.3 Attempt any two.** **12**

- a) What is DC characteristic of CMOS inverter? How it is affected by Bn/Bp ratio? What are various regions of this DC characteristic?
- b) What is dynamic CMOS logic? Draw and analyze three input XOR gate using this logic.
- c) What are issues in design of dynamic CMOS logic and how to overcome them?

**Section – II**

**Q.4 Attempt any four.** **16**

- a) What is bistability principle? Draw and explain positive latch using transmission gates & inverters.
- b) What are problems in designing low voltage static latch? How these problems are resolved?
- c) What is Asynchronous interconnect? Explain in detail.
- d) How PLL can be used for clock synchronization?
- e) Draw any one structure for 4 bit full adder and explain.
- f) Draw and explain 4 x 4 ROM cell.

**Q.5 Attempt any two.** **12**

- a) What are sources of clock skew & jitter? Explain in detail.
- b) What is necessity of TSPCR? Draw & explain positive edge triggered register in TSPC.
- c) What are problems in ripple carry adders? Draw any one structure of fast full adder and explain.

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Set **S**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Assume suitable data if required and state it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) For CMOS layout, which of the following layer is used for gate?
  - a) P<sup>+</sup> diffusion
  - b) N<sup>+</sup> diffusion
  - c) Polysilicon
  - d) Metal-1
- 2) For four input dynamic NAND gate, which of the following parameter is zero?
  - a) N<sub>MH</sub>
  - b) N<sub>ML</sub>
  - c) t<sub>PHL</sub>
  - d) t<sub>PLH</sub>
- 3) For positive edge triggered register, which sequence of cascading the latches is correct?
  - a) positive, negative
  - b) negative, positive
  - c) negative, negative
  - d) positive, positive
- 4) For SR flipflop using NAND gates, which of the condition of S R inputs is forbidden?
  - a) 0,0
  - b) 0,1
  - c) 1,0
  - d) 1,1
- 5) A C<sup>2</sup>MOS register with CLK-CLK' clocking is insensitive to \_\_\_\_\_ overlap, as long as the rise and fall times of the clock edges are sufficiently small.
  - a) (0,0)
  - b) (1,1)
  - c) (0,0) & (1,1)
  - d) None
- 6) Clock skew is caused by static mismatches in the \_\_\_\_\_ paths and differences in the \_\_\_\_\_ load.
  - a) Ground, V<sub>cc</sub>
  - b) V<sub>cc</sub>, ground
  - c) Signal, V<sub>cc</sub>
  - d) Clock, clock
- 7) Which of the following statement is false
  - a) Clock skew does not result in clock period variation
  - b) Clock jitter produces variation in clock period
  - c) Clock skew produces variation in clock period
  - d) None
- 8) Ripple carry adders has a performance that is \_\_\_\_\_ proportional to the number of bits
  - a) Linearly
  - b) Square
  - c) Square root
  - d) Logarithmic

- 9) Which of the following statement is wrong?
- a) Low voltage operation around 1.0 V or below is one of the solutions being employed in state of the art memories
  - b) Memory cell should be designed so that a maximum signal is obtained in a minimum area
  - c) A memory must operate correctly over a variety of operating and manufacturing condition
  - d) None
- 10) For n-MOS to operate in inversion mode, which of the following condition is true.
- a)  $V_{GS} < V_T$
  - b)  $V_{GS} = V_T$
  - c)  $V_{GS} > V_T$
  - d) None
- 11) Which of the following power dissipation is smallest for CMOS inverter?
- a) Static
  - b) Dynamic
  - c) Short circuit
  - d) None
- 12) If frequency of input to CMOS inverter is doubled keeping other parameters same, what will be effect on dynamic power dissipation?
- a) It is unchanged
  - b) It will be doubled
  - c) It will be four times
  - d) It will be eight times
- 13) Static CMOS design of  $Y=A \text{ XOR } B$  requires \_\_\_\_\_ number of NMOS & \_\_\_\_\_ number of PMOS transistors.
- a) 4,4
  - b) 6,6
  - c) 8,8
  - d) 2,2
- 14) For N input dynamic gate, it requires \_\_\_\_\_ number of MOS transistors.
- a) N
  - b) N+1
  - c) 2N
  - d) N+2

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**CMOS VLSI Design**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Draw structure of n channel Enhancement MOSFET. What is Accumulation, depletion & inversion modes?
- b) What is static power dissipation of CMOS inverter?
- c) Draw stick diagram of two input NOR gate.
- d) Draw layout of two input CMOS AND gate.
- e) Design half subtractor using complimentary CMOS logic.
- f) What is pass transistor logic? Design two input XNOR gate using this logic.

**Q.3 Attempt any two.** **12**

- a) What is DC characteristic of CMOS inverter? How it is affected by Bn/Bp ratio? What are various regions of this DC characteristic?
- b) What is dynamic CMOS logic? Draw and analyze three input XOR gate using this logic.
- c) What are issues in design of dynamic CMOS logic and how to overcome them?

**Section – II**

**Q.4 Attempt any four.** **16**

- a) What is bistability principle? Draw and explain positive latch using transmission gates & inverters.
- b) What are problems in designing low voltage static latch? How these problems are resolved?
- c) What is Asynchronous interconnect? Explain in detail.
- d) How PLL can be used for clock synchronization?
- e) Draw any one structure for 4 bit full adder and explain.
- f) Draw and explain 4 x 4 ROM cell.

**Q.5 Attempt any two.** **12**

- a) What are sources of clock skew & jitter? Explain in detail.
- b) What is necessity of TSPCR? Draw & explain positive edge triggered register in TSPC.
- c) What are problems in ripple carry adders? Draw any one structure of fast full adder and explain.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Industrial IOT**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following connects an IoT LAN with a WAN, and to the Internet?
 

a) IoT node	b) IoT proxy
c) IoT gateway	d) IoT Network
- 2) Which of the following is/are the IIoT requirements in industry 4.0?
 

a) Achieve greater production
b) Deeper insights of analysis and prediction
c) Connected world of machines
d) All of the above
- 3) What are the benefits of IIoT?
 

a) Improves productivity	b) Enables remote diagnosis
c) Reduces operation time	d) All of the above
- 4) How many key elements are there in the industrial internet?
 

a) 5	b) 3
c) 2	d) None of these
- 5) Which of the following best describes a smart sensor?
 

a) Sensor with smart memory, processor and communication interface
b) Sensor with only memory
c) Sensor with LED
d) Sensor with buzzer
- 6) What is the frequency range in which 6LoWPAN works worldwide?
 

a) 2400- 2483.5 MHz	b) 2300- 2345 MHz
c) 2400-2843.5 MHz	d) 2400- 2583.5 MHz
- 7) Mention some characteristics of iot devices.
 

a) Low processing power	b) Smart in size
c) Energy constrained in nature	d) All of these
- 8) The data to be loaded into the BigQuery from the cloud storage can be of \_\_\_\_\_ format.
 

a) ORC	b) All of these
c) JSON	d) Parquet



- 9) BigQuery utilizes \_\_\_\_\_ storage.
- a) Graph
  - b) Document
  - c) Key-value
  - d) Columnar
- 10) How are cloud datastore and cloud bigtable alike?
- a) both are highly scalable
  - b) both are highly scalable and nosql databases
  - c) both are nosql databases
  - d) None of these
- 11) Which of the following disk formats is/are supported by Glance?
- a) RAW
  - b) VHD
  - c) RAW and VHD
  - d) None of these
- 12) In OpenStack which of the following components take care of user authentication?
- a) Nova
  - b) Horizon
  - c) Keystone
  - d) None of these
- 13) Which of the following connects an IoT LAN with a WAN, and to the Internet?
- a) IoT node
  - b) IoT proxy
  - c) IoT gateway
  - d) IoT Network
- 14) Which of the following is/are the IIoT requirements in industry 4.0?
- a) Achieve greater production
  - b) Deeper insights of analysis and prediction
  - c) Connected world of machines
  - d) All of the above

Seat No.	
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P

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Industrial IOT**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) Explain how utilizing IIoT technology can unlock and deliver value to the HealthCare industry.
- b) Explain how IIAF based on ISO/IEC/IEEE 42010:2011 standard codifies the conventions and common practices of architect design.
- c) Explain the evolution of IIoT layers from the OSI model.
- d) Write a short note on IPv6 over low-power personal area networks.

**Q.3 Attempt any TWO.** **16**

- a) Explain the types and methods of analytics in IIoT.
- b) Discuss in detail the Industrial Internet Consortium Three-Tier Topology in IIoT.
- c) Discuss in detail the potential security issues at network level of IIoT.

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Explain the process of Storing data on AWS.
- b) What are the two main components of Google Cloud IoT core, explain with suitable example.
- c) Write note on the following components:
  - 1) Bare Metal
  - 2) Virtual Machine
- d) Explain the following core projects of Open Stack ecosystem:
  - 1) imaging
  - 2) dashboard
  - 3) networking

**Q.5 Attempt any TWO.** **16**

- a) Explain the four types of VPC architectures available in AWS with suitable diagram.
- b) Briefly explain the modern architecture of open stack with appropriate diagram.
- c) Explain why Bigtable is ideal for applications that need very high throughput and scalability for key/value data?

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Set Q
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Industrial IOT**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The data to be loaded into the BigQuery from the cloud storage can be of \_\_\_\_\_ format.
 

a) ORC	b) All of these
c) JSON	d) Parquet
- 2) BigQuery utilizes \_\_\_\_\_ storage.
 

a) Graph	b) Document
c) Key-value	d) Columnar
- 3) How are cloud datastore and cloud bigtable alike?
 

a) both are highly scalable
b) both are highly scalable and nosql databases
c) both are nosql databases
d) None of these
- 4) Which of the following disk formats is/are supported by Glance?
 

a) RAW	b) VHD
c) RAW and VHD	d) None of these
- 5) In OpenStack which of the following components take care of user authentication?
 

a) Nova	b) Horizon
c) Keystone	d) None of these
- 6) Which of the following connects an IoT LAN with a WAN, and to the Internet?
 

a) IoT node	b) IoT proxy
c) IoT gateway	d) IoT Network
- 7) Which of the following is/are the IIoT requirements in industry 4.0?
 

a) Achieve greater production
b) Deeper insights of analysis and prediction
c) Connected world of machines
d) All of the above

- 8) Which of the following connects an IoT LAN with a WAN, and to the Internet?
- a) IoT node
  - b) IoT proxy
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  - d) IoT Network
- 9) Which of the following is/are the IIoT requirements in industry 4.0?
- a) Achieve greater production
  - b) Deeper insights of analysis and prediction
  - c) Connected world of machines
  - d) All of the above
- 10) What are the benefits of IIoT?
- a) Improves productivity
  - b) Enables remote diagnosis
  - c) Reduces operation time
  - d) All of the above
- 11) How many key elements are there in the industrial internet?
- a) 5
  - b) 3
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- 12) Which of the following best describes a smart sensor?
- a) Sensor with smart memory, processor and communication interface
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- 14) Mention some characteristics of iot devices.
- a) Low processing power
  - b) Smart in size
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  - d) All of these

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Industrial IOT**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) Explain how utilizing IIoT technology can unlock and deliver value to the HealthCare industry.
- b) Explain how IIAF based on ISO/IEC/IEEE 42010:2011 standard codifies the conventions and common practices of architect design.
- c) Explain the evolution of IIoT layers from the OSI model.
- d) Write a short note on IPv6 over low-power personal area networks.

**Q.3 Attempt any TWO.** **16**

- a) Explain the types and methods of analytics in IIoT.
- b) Discuss in detail the Industrial Internet Consortium Three-Tier Topology in IIoT.
- c) Discuss in detail the potential security issues at network level of IIoT.

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Explain the process of Storing data on AWS.
- b) What are the two main components of Google Cloud IoT core, explain with suitable example.
- c) Write note on the following components:
  - 1) Bare Metal
  - 2) Virtual Machine
- d) Explain the following core projects of Open Stack ecosystem:
  - 1) imaging
  - 2) dashboard
  - 3) networking

**Q.5 Attempt any TWO.** **16**

- a) Explain the four types of VPC architectures available in AWS with suitable diagram.
- b) Briefly explain the modern architecture of open stack with appropriate diagram.
- c) Explain why Bigtable is ideal for applications that need very high throughput and scalability for key/value data?

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Industrial IOT**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following disk formats is/are supported by Glance?
  - a) RAW
  - b) VHD
  - c) RAW and VHD
  - d) None of these
- 2) In OpenStack which of the following components take care of user authentication?
  - a) Nova
  - b) Horizon
  - c) Keystone
  - d) None of these
- 3) Which of the following connects an IoT LAN with a WAN, and to the Internet?
  - a) IoT node
  - b) IoT proxy
  - c) IoT gateway
  - d) IoT Network
- 4) Which of the following is/are the IIoT requirements in industry 4.0?
  - a) Achieve greater production
  - b) Deeper insights of analysis and prediction
  - c) Connected world of machines
  - d) All of the above
- 5) Which of the following connects an IoT LAN with a WAN, and to the Internet?
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  - d) All of the above
- 7) What are the benefits of IIoT?
  - a) Improves productivity
  - b) Enables remote diagnosis
  - c) Reduces operation time
  - d) All of the above
- 8) How many key elements are there in the industrial internet?
  - a) 5
  - b) 3
  - c) 2
  - d) None of these

- 9) Which of the following best describes a smart sensor?
- a) Sensor with smart memory, processor and communication interface
  - b) Sensor with only memory
  - c) Sensor with LED
  - d) Sensor with buzzer
- 10) What is the frequency range in which 6LoWPAN works worldwide?
- a) 2400- 2483.5 MHz
  - b) 2300- 2345 MHz
  - c) 2400-2843.5 MHz
  - d) 2400- 2583.5 MHz
- 11) Mention some characteristics of iot devices.
- a) Low processing power
  - b) Smart in size
  - c) Energy constrained in nature
  - d) All of these
- 12) The data to be loaded into the BigQuery from the cloud storage can be of \_\_\_\_\_ format.
- a) ORC
  - b) All of these
  - c) JSON
  - d) Parquet
- 13) BigQuery utilizes \_\_\_\_\_ storage.
- a) Graph
  - b) Document
  - c) Key-value
  - d) Columnar
- 14) How are cloud datastore and cloud bigtable alike?
- a) both are highly scalable
  - b) both are highly scalable and nosql databases
  - c) both are nosql databases
  - d) None of these

Seat No.	
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R
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Industrial IOT**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) Explain how utilizing IIoT technology can unlock and deliver value to the HealthCare industry.
- b) Explain how IIAF based on ISO/IEC/IEEE 42010:2011 standard codifies the conventions and common practices of architect design.
- c) Explain the evolution of IIoT layers from the OSI model.
- d) Write a short note on IPv6 over low-power personal area networks.

**Q.3 Attempt any TWO.** **16**

- a) Explain the types and methods of analytics in IIoT.
- b) Discuss in detail the Industrial Internet Consortium Three-Tier Topology in IIoT.
- c) Discuss in detail the potential security issues at network level of IIoT.

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Explain the process of Storing data on AWS.
- b) What are the two main components of Google Cloud IoT core, explain with suitable example.
- c) Write note on the following components:
  - 1) Bare Metal
  - 2) Virtual Machine
- d) Explain the following core projects of Open Stack ecosystem:
  - 1) imaging
  - 2) dashboard
  - 3) networking

**Q.5 Attempt any TWO.** **16**

- a) Explain the four types of VPC architectures available in AWS with suitable diagram.
- b) Briefly explain the modern architecture of open stack with appropriate diagram.
- c) Explain why Bigtable is ideal for applications that need very high throughput and scalability for key/value data?



Seat No.	
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Industrial IOT**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is the frequency range in which 6LoWPAN works worldwide?
 

a) 2400- 2483.5 MHz	b) 2300- 2345 MHz
c) 2400-2843.5 MHz	d) 2400- 2583.5 MHz
- 2) Mention some characteristics of iot devices.
 

a) Low processing power	b) Smart in size
c) Energy constrained in nature	d) All of these
- 3) The data to be loaded into the BigQuery from the cloud storage can be of \_\_\_\_\_ format.
 

a) ORC	b) All of these
c) JSON	d) Parquet
- 4) BigQuery utilizes \_\_\_\_\_ storage.
 

a) Graph	b) Document
c) Key-value	d) Columnar
- 5) How are cloud datastore and cloud bigtable alike?
 

a) both are highly scalable
b) both are highly scalable and nosql databases
c) both are nosql databases
d) None of these
- 6) Which of the following disk formats is/are supported by Glance?
 

a) RAW	b) VHD
c) RAW and VHD	d) None of these
- 7) In OpenStack which of the following components take care of user authentication?
 

a) Nova	b) Horizon
c) Keystone	d) None of these
- 8) Which of the following connects an IoT LAN with a WAN, and to the Internet?
 

a) IoT node	b) IoT proxy
c) IoT gateway	d) IoT Network

- 9)** Which of the following is/are the IIoT requirements in industry 4.0?
- a) Achieve greater production
  - b) Deeper insights of analysis and prediction
  - c) Connected world of machines
  - d) All of the above
- 10)** Which of the following connects an IoT LAN with a WAN, and to the Internet?
- a) IoT node
  - b) IoT proxy
  - c) IoT gateway
  - d) IoT Network
- 11)** Which of the following is/are the IIoT requirements in industry 4.0?
- a) Achieve greater production
  - b) Deeper insights of analysis and prediction
  - c) Connected world of machines
  - d) All of the above
- 12)** What are the benefits of IIoT?
- a) Improves productivity
  - b) Enables remote diagnosis
  - c) Reduces operation time
  - d) All of the above
- 13)** How many key elements are there in the industrial internet?
- a) 5
  - b) 3
  - c) 2
  - d) None of these
- 14)** Which of the following best describes a smart sensor?
- a) Sensor with smart memory, processor and communication interface
  - b) Sensor with only memory
  - c) Sensor with LED
  - d) Sensor with buzzer

Seat No.	
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Set **S**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Industrial IOT**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) Explain how utilizing IIoT technology can unlock and deliver value to the HealthCare industry.
- b) Explain how IIAF based on ISO/IEC/IEEE 42010:2011 standard codifies the conventions and common practices of architect design.
- c) Explain the evolution of IIoT layers from the OSI model.
- d) Write a short note on IPv6 over low-power personal area networks.

**Q.3 Attempt any TWO.** **16**

- a) Explain the types and methods of analytics in IIoT.
- b) Discuss in detail the Industrial Internet Consortium Three-Tier Topology in IIoT.
- c) Discuss in detail the potential security issues at network level of IIoT.

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Explain the process of Storing data on AWS.
- b) What are the two main components of Google Cloud IoT core, explain with suitable example.
- c) Write note on the following components:
  - 1) Bare Metal
  - 2) Virtual Machine
- d) Explain the following core projects of Open Stack ecosystem:
  - 1) imaging
  - 2) dashboard
  - 3) networking

**Q.5 Attempt any TWO.** **16**

- a) Explain the four types of VPC architectures available in AWS with suitable diagram.
- b) Briefly explain the modern architecture of open stack with appropriate diagram.
- c) Explain why Bigtable is ideal for applications that need very high throughput and scalability for key/value data?

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence and Applications**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Artificial Intelligence is about \_\_\_\_\_.  
 a) Playing a game on Computer  
 b) Making a machine Intelligent  
 c) Programming on Machine with your Own Intelligence  
 d) Putting your intelligence in Machine
- 2) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the \_\_\_\_\_.  
 a) Mobile  
 b) Non-Servo  
 c) Open Loop  
 d) Intelligent
- 3) Which algorithm is used in the Game tree to make decisions of Win/Lose?  
 a) Heuristic Search Algorithm  
 b) DFS/BFS algorithm  
 c) Greedy Search Algorithm  
 d) Min/Max algorithm
- 4) The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as \_\_\_\_\_.  
 a) Depth-first search  
 b) Breadth-first search  
 c) Alpha-beta pruning  
 d) None of the above
- 5) Among the given options, which search algorithm requires less memory?  
 a) Optimal Search  
 b) Depth First Search  
 c) Breadth-First Search  
 d) Linear Search
- 6) Which term describes the common-sense of the judgmental part of problem-solving?  
 a) Values-based  
 b) Critical  
 c) Analytical  
 d) Heuristic
- 7) Which search is implemented with an empty first in first out Queue?  
 a) Depth First search  
 b) Breadth first search  
 c) Bidirectional search  
 d) None of the above
- 8) What is the space complexity of Depth First Search?  
 a)  $O(b)$   
 b)  $O(bl)$   
 c)  $O(m)$   
 d)  $O(bm)$

- 9) Computer programs, directions and recipes are the examples of \_\_\_\_\_.  
a) Inheritable knowledge                      b) Relational knowledge  
c) Inferential knowledge                      d) Procedural knowledge
- 10) In which of the following applications can we use deep learning to solve the problem?  
a) Protein structure prediction                      b) Prediction of chemical reactions  
c) Detection of exotic particles                      d) All of the above
- 11) CNN is mostly used when there is an?  
a) structured data                      b) unstructured data  
c) Both A and B                      d) None of the above
- 12) What are the difficulties in NLU?  
a) Lexical ambiguity                      b) Syntax Level ambiguity  
c) Referential ambiguity                      d) All of the Above
- 13) Which of the following is not the functionality of the Robot?  
a) Reprogrammability                      b) Multifunctionality  
c) Efficient Performance                      d) Responsibility
- 14) How many layers Deep learning algorithms are constructed?  
a) 2                      b) 3  
c) 4                      d) 5

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence and Applications**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**Section – I**

- Q.2 Solve any THREE.** **12**
- a) Discuss Problems and Approaches of AI.
  - b) What is Intelligent Agent? Explain any one of the Intelligent Agents?
  - c) Explain Heuristic Search Techniques.
  - d) Explain Event and Situation Calculus.
- Q.3 Solve any TWO.** **16**
- a) What is minimax Algorithm? How Alpha Beta Pruning overcomes the drawbacks of Minimax?
  - b) Explain in details about Knowledge Representations and Reasoning with examples.
  - c) Explain First Order Logic and Description Logic.

**Section – II**

- Q.4 Solve any THREE.** **12**
- a) What is NL and Why NL?
  - b) Explain Industrial Manipulators.
  - c) Explain Probabilistic Language Models.
  - d) What is Machine Making Intelligent?
- Q.5 Solve any TWO.** **16**
- a) What is Deep learning Network and explain CNN in detail?
  - b) Explain applications of Deep Learning in computer Vision.
  - c) Explain use of Robots and Space Robotics with AI approach.

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

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Marks: 14

14

- Page 4 of 12

- 9) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the \_\_\_\_\_.  
a) Mobile                                      b) Non-Servo  
c) Open Loop                                  d) Intelligent
- 10) Which algorithm is used in the Game tree to make decisions of Win/Lose?  
a) Heuristic Search Algorithm            b) DFS/BFS algorithm  
c) Greedy Search Algorithm               d) Min/Max algorithm
- 11) The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as \_\_\_\_\_.  
a) Depth-first search                        b) Breadth-first search  
c) Alpha-beta pruning                       d) None of the above
- 12) Among the given options, which search algorithm requires less memory?  
a) Optimal Search                            b) Depth First Search  
c) Breadth-First Search                    d) Linear Search
- 13) Which term describes the common-sense of the judgmental part of problem-solving?  
a) Values-based                                b) Critical  
c) Analytical                                    d) Heuristic
- 14) Which search is implemented with an empty first in first out Queue?  
a) Depth First search                        b) Breadth first search  
c) Bidirectional search                     d) None of the above



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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence and Applications**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Solve any THREE.** **12**
- a) Discuss Problems and Approaches of AI.
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  - c) Explain Heuristic Search Techniques.
  - d) Explain Event and Situation Calculus.
- Q.3 Solve any TWO.** **16**
- a) What is minimax Algorithm? How Alpha Beta Pruning overcomes the drawbacks of Minimax?
  - b) Explain in details about Knowledge Representations and Reasoning with examples.
  - c) Explain First Order Logic and Description Logic.

**Section – II**

- Q.4 Solve any THREE.** **12**
- a) What is NL and Why NL?
  - b) Explain Industrial Manipulators.
  - c) Explain Probabilistic Language Models.
  - d) What is Machine Making Intelligent?
- Q.5 Solve any TWO.** **16**
- a) What is Deep learning Network and explain CNN in detail?
  - b) Explain applications of Deep Learning in computer Vision.
  - c) Explain use of Robots and Space Robotics with AI approach.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence and Applications**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) CNN is mostly used when there is an?
  - a) structured data
  - b) unstructured data
  - c) Both A and B
  - d) None of the above
- 2) What are the difficulties in NLU?
  - a) Lexical ambiguity
  - b) Syntax Level ambiguity
  - c) Referential ambiguity
  - d) All of the Above
- 3) Which of the following is not the functionality of the Robot?
  - a) Reprogramability
  - b) Multifunctionality
  - c) Efficient Performance
  - d) Responsibility
- 4) How many layers Deep learning algorithms are constructed?
  - a) 2
  - b) 3
  - c) 4
  - d) 5
- 5) Artificial Intelligence is about \_\_\_\_\_.
  - a) Playing a game on Computer
  - b) Making a machine Intelligent
  - c) Programming on Machine with your Own Intelligence
  - d) Putting your intelligence in Machine
- 6) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the \_\_\_\_\_.
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  - b) Non-Servo
  - c) Open Loop
  - d) Intelligent
- 7) Which algorithm is used in the Game tree to make decisions of Win/Lose?
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- 8) The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as \_\_\_\_\_.
  - a) Depth-first search
  - b) Breadth-first search
  - c) Alpha-beta pruning
  - d) None of the above

- 9) Among the given options, which search algorithm requires less memory?
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  - b) Depth First Search
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- 10) Which term describes the common-sense of the judgmental part of problem-solving?
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  - d) None of the above
- 12) What is the space complexity of Depth First Search?
- a)  $O(b)$
  - b)  $O(bl)$
  - c)  $O(m)$
  - d)  $O(bm)$
- 13) Computer programs, directions and recipes are the examples of \_\_\_\_.
- a) Inheritable knowledge
  - b) Relational knowledge
  - c) Inferential knowledge
  - d) Procedural knowledge
- 14) In which of the following applications can we use deep learning to solve the problem?
- a) Protein structure prediction
  - b) Prediction of chemical reactions
  - c) Detection of exotic particles
  - d) All of the above

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence and Applications**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Solve any THREE.** **12**
- a) Discuss Problems and Approaches of AI.
  - b) What is Intelligent Agent? Explain any one of the Intelligent Agents?
  - c) Explain Heuristic Search Techniques.
  - d) Explain Event and Situation Calculus.
- Q.3 Solve any TWO.** **16**
- a) What is minimax Algorithm? How Alpha Beta Pruning overcomes the drawbacks of Minimax?
  - b) Explain in details about Knowledge Representations and Reasoning with examples.
  - c) Explain First Order Logic and Description Logic.

**Section – II**

- Q.4 Solve any THREE.** **12**
- a) What is NL and Why NL?
  - b) Explain Industrial Manipulators.
  - c) Explain Probabilistic Language Models.
  - d) What is Machine Making Intelligent?
- Q.5 Solve any TWO.** **16**
- a) What is Deep learning Network and explain CNN in detail?
  - b) Explain applications of Deep Learning in computer Vision.
  - c) Explain use of Robots and Space Robotics with AI approach.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence and Applications**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which term describes the common-sense of the judgmental part of problem-solving?
 

a) Values-based	b) Critical
c) Analytical	d) Heuristic
- 2) Which search is implemented with an empty first in first out Queue?
 

a) Depth First search	b) Breadth first search
c) Bidirectional search	d) None of the above
- 3) What is the space complexity of Depth First Search?
 

a) $O(b)$	b) $O(bl)$
c) $O(m)$	d) $O(bm)$
- 4) Computer programs, directions and recipes are the examples of \_\_\_\_\_.
 

a) Inheritable knowledge	b) Relational knowledge
c) Inferential knowledge	d) Procedural knowledge
- 5) In which of the following applications can we use deep learning to solve the problem?
 

a) Protein structure prediction	b) Prediction of chemical reactions
c) Detection of exotic particles	d) All of the above
- 6) CNN is mostly used when there is an?
 

a) structured data	b) unstructured data
c) Both A and B	d) None of the above
- 7) What are the difficulties in NLU?
 

a) Lexical ambiguity	b) Syntax Level ambiguity
c) Referential ambiguity	d) All of the Above
- 8) Which of the following is not the functionality of the Robot?
 

a) Reprogramability	b) Multifunctionality
c) Efficient Performance	d) Responsibility
- 9) How many layers Deep learning algorithms are constructed?
 

a) 2	b) 3
c) 4	d) 5

- 10)** Artificial Intelligence is about \_\_\_\_\_.  
a) Playing a game on Computer  
b) Making a machine Intelligent  
c) Programming on Machine with your Own Intelligence  
d) Putting your intelligence in Machine
- 11)** If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the \_\_\_\_\_.  
a) Mobile  
b) Non-Servo  
c) Open Loop  
d) Intelligent
- 12)** Which algorithm is used in the Game tree to make decisions of Win/Lose?  
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- 13)** The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as \_\_\_\_\_.  
a) Depth-first search  
b) Breadth-first search  
c) Alpha-beta pruning  
d) None of the above
- 14)** Among the given options, which search algorithm requires less memory?  
a) Optimal Search  
b) Depth First Search  
c) Breadth-First Search  
d) Linear Search

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**Set S**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONIC & TELECOMMUNICATION ENGINEERING**  
**Artificial Intelligence and Applications**

Day &amp; Date: Monday, 20-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**Section – I**

**Q.2 Solve any THREE. 12**

- a) Discuss Problems and Approaches of AI.
- b) What is Intelligent Agent? Explain any one of the Intelligent Agents?
- c) Explain Heuristic Search Techniques.
- d) Explain Event and Situation Calculus.

**Q.3 Solve any TWO. 16**

- a) What is minimax Algorithm? How Alpha Beta Pruning overcomes the drawbacks of Minimax?
- b) Explain in details about Knowledge Representations and Reasoning with examples.
- c) Explain First Order Logic and Description Logic.

**Section – II**

**Q.4 Solve any THREE. 12**

- a) What is NL and Why NL?
- b) Explain Industrial Manipulators.
- c) Explain Probabilistic Language Models.
- d) What is Machine Making Intelligent?

**Q.5 Solve any TWO. 16**

- a) What is Deep learning Network and explain CNN in detail?
- b) Explain applications of Deep Learning in computer Vision.
- c) Explain use of Robots and Space Robotics with AI approach.

<b>Seat No.</b>	
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- 10) \_\_\_\_\_ is a software program that can copy itself and infect the data or information, without the user's knowledge.
- a) Computer virus
  - b) Computer Worm
  - c) Antivirus
  - d) All of these
- 11) \_\_\_\_\_ refer to sending a large number of E-Mails to the victim to crash victim's E-Mail account or to make victim's mail server crash.
- a) Software Privacy
  - b) E-Mail Bombing
  - c) Web Jacking
  - d) Computer Virus
- 12) In PGP services, for providing digital signature \_\_\_\_\_ algorithm is used.
- a) DSS/SHA
  - b) RSA/SHA
  - c) Both a and b
  - d) IDEA
- 13) SET is an open Encryption and Security Specification designed to protect
- a) E - mail
  - b) Credit Card Transaction
  - c) Intrusion detection
  - d) All of these
- 14) Simple Mail Transfer protocol is an example of \_\_\_\_\_
- a) One way Authentication
  - b) Two way authentication
  - c) Three way authentication
  - d) None of these

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**Set****P**

**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Security**

Day & Date: Wednesday 22-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- a) Explain the Active and Passive attacks.
- b) Explain a model for Network Security in brief.
- c) Explain the Play fair Cipher in brief.
- d) Explain Symmetric Key Distribution Using Symmetric Encryption.
- e) Explain X.509 Certificates in brief.

**Q.3 Answer the following (Any Two) 12**

- a) Explain various substitution techniques in detail.
- b) Explain the working of DES with neat diagram.
- c) Explain RSA Algorithm with example.

**Section – II**

**Q.4 Answer the following (Any Four) 16**

- a) Explain the Worm and its types.
- b) Explain Transport and Tunnel mode of IPSec.
- c) Discuss the difference between Virus and Worm.
- d) Discuss Cloud Security as a Service.
- e) Explain the DoS and DDoS Attacks.

**Q.5 Answer the following (Any Two) 12**

- a) Explain Security Electronic Transaction (SET) protocol with diagram.
- b) Explain SQL Injection. Describe steps for SQL Injection Attacks. How to Prevent SQL injection attack.
- c) Who are Cybercriminals? Explain the types of Cybercriminals.

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**Set Q**

**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Security**

Day & Date: Wednesday 22-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- a) Explain the Active and Passive attacks.
- b) Explain a model for Network Security in brief.
- c) Explain the Play fair Cipher in brief.
- d) Explain Symmetric Key Distribution Using Symmetric Encryption.
- e) Explain X.509 Certificates in brief.

**Q.3 Answer the following (Any Two) 12**

- a) Explain various substitution techniques in detail.
- b) Explain the working of DES with neat diagram.
- c) Explain RSA Algorithm with example.

**Section – II**

**Q.4 Answer the following (Any Four) 16**

- a) Explain the Worm and its types.
- b) Explain Transport and Tunnel mode of IPSec.
- c) Discuss the difference between Virus and Worm.
- d) Discuss Cloud Security as a Service.
- e) Explain the DoS and DDoS Attacks.

**Q.5 Answer the following (Any Two) 12**

- a) Explain Security Electronic Transaction (SET) protocol with diagram.
- b) Explain SQL Injection. Describe steps for SQL Injection Attacks. How to Prevent SQL injection attack.
- c) Who are Cybercriminals? Explain the types of Cybercriminals.

Seat No.	
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Set	R
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**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Security**

Day & Date: Wednesday 22-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ refer to sending a large number of E-Mails to the victim to crash victim's E-Mail account or to make victim's mail server crash.
  - a) Software Privacy
  - b) E-Mail Bombing
  - c) Web Jacking
  - d) Computer Virus
- 2) In PGP services, for providing digital signature \_\_\_\_\_ algorithm is used.
  - a) DSS/SHA
  - b) RSA/SHA
  - c) Both a and b
  - d) IDEA
- 3) SET is an open Encryption and Security Specification designed to protect
  - a) E - mail
  - b) Credit Card Transaction
  - c) Intrusion detection
  - d) All of these
- 4) Simple Mail Transfer protocol is an example of \_\_\_\_\_
  - a) One way Authentication
  - b) Two way authentication
  - c) Three way authentication
  - d) None of these
- 5) Traffic Analysis is \_\_\_\_\_.
  - a) Passive attack
  - b) Active attack
  - c) Not an attack
  - d) Security mechanism
- 6) \_\_\_\_\_ involves capture of data unit and its subsequent retransmission to produce an unauthorized effect.
  - a) Masquerade
  - b) Man in the middle attack
  - c) Timing attack
  - d) Replay
- 7) A substitution technique in which every new message requires a new key of the same length as the new message is known as \_\_\_\_\_.
  - a) Hill Cipher
  - b) Playfair Cipher
  - c) One-time Pad
  - d) Caesar Ciph4
- 8) Rail Fence technique is \_\_\_\_\_.
  - a) Substitution technique
  - b) Transposition technique
  - c) Mono alphabetic cipher
  - d) None of these
- 9) The process that is designed to detect, prevent or recover attack is \_\_\_\_\_.
  - a) Security
  - b) Security mechanism
  - c) Security service
  - d) Threat

- 10) Any action that compromises the security of information owned by an organization is known as \_\_\_\_\_.  
a) Security Attack                      b) Security Mechanism  
c) Security Service                      d) All the above
- 11) In \_\_\_\_\_ mode a counter equal to the plaintext block size is used.  
a) CBC                                      b) ECB  
c) CFB                                      d) CTR
- 12) A typical block size in RSA algorithm is \_\_\_\_\_.  
a) 64 bit                                      b) 128 bit  
c) 512 bit                                      d) 1024 bit
- 13) Data Encryption Standard has \_\_\_\_\_ data.  
a) 64 bit                                      b) 56 bit  
c) 48 bit                                      d) None of these
- 14) \_\_\_\_\_ is a software program that can copy itself and infect the data or information, without the user's knowledge.  
a) Computer virus                      b) Computer Worm  
c) Antivirus                              d) All of these

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**Set R**

**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Security**

Day & Date: Wednesday 22-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- a) Explain the Active and Passive attacks.
- b) Explain a model for Network Security in brief.
- c) Explain the Play fair Cipher in brief.
- d) Explain Symmetric Key Distribution Using Symmetric Encryption.
- e) Explain X.509 Certificates in brief.

**Q.3 Answer the following (Any Two) 12**

- a) Explain various substitution techniques in detail.
- b) Explain the working of DES with neat diagram.
- c) Explain RSA Algorithm with example.

**Section – II**

**Q.4 Answer the following (Any Four) 16**

- a) Explain the Worm and its types.
- b) Explain Transport and Tunnel mode of IPSec.
- c) Discuss the difference between Virus and Worm.
- d) Discuss Cloud Security as a Service.
- e) Explain the DoS and DDoS Attacks.

**Q.5 Answer the following (Any Two) 12**

- a) Explain Security Electronic Transaction (SET) protocol with diagram.
- b) Explain SQL Injection. Describe steps for SQL Injection Attacks. How to Prevent SQL injection attack.
- c) Who are Cybercriminals? Explain the types of Cybercriminals.



Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks:14

14

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**Set S**

**Fourth Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Security**

Day & Date: Wednesday 22-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- a) Explain the Active and Passive attacks.
- b) Explain a model for Network Security in brief.
- c) Explain the Play fair Cipher in brief.
- d) Explain Symmetric Key Distribution Using Symmetric Encryption.
- e) Explain X.509 Certificates in brief.

**Q.3 Answer the following (Any Two) 12**

- a) Explain various substitution techniques in detail.
- b) Explain the working of DES with neat diagram.
- c) Explain RSA Algorithm with example.

**Section – II**

**Q.4 Answer the following (Any Four) 16**

- a) Explain the Worm and its types.
- b) Explain Transport and Tunnel mode of IPSec.
- c) Discuss the difference between Virus and Worm.
- d) Discuss Cloud Security as a Service.
- e) Explain the DoS and DDoS Attacks.

**Q.5 Answer the following (Any Two) 12**

- a) Explain Security Electronic Transaction (SET) protocol with diagram.
- b) Explain SQL Injection. Describe steps for SQL Injection Attacks. How to Prevent SQL injection attack.
- c) Who are Cybercriminals? Explain the types of Cybercriminals.

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) In Big Data environments, Veracity makes sure that the data is \_\_\_\_\_.  
a) Accurate                                      b) Inconsistence  
c) Variant                                        d) None of the mentioned
- 2) The Big Data architecture is designed in such a way so that it can handle \_\_\_\_\_.  
a) Data ingestion                                  b) Data processing  
c) Data analysis                                  d) All
- 3) Diagnostic analytics answers the question.  
a) What happened?  
b) What is the best course of action?  
c) What is likely to happen?  
d) Why did it happen?
- 4) The type of a Nominal attribute depends on which of the following properties:  
a) Distinctness & order                          b) Order  
c) Distinctness                                    d) None
- 5) \_\_\_\_\_ is the graphical representation of data where data is grouped into continuous number ranges and each range corresponds to a vertical bar.  
a) Line Chart                                      b) Bar Chart  
c) Histogram                                      d) Pie Chart
- 6) Which of the following is true about outliers?  
a) Data points that deviate a lot from normal observations  
b) Can reduce the accuracy of the model  
c) Both a and b  
d) None
- 7) Which of the following(s) is/are features scaling techniques?  
a) Standardization                                b) Min-Max Scaling  
c) Both a & b                                      d) None
- 8) R files has an extension \_\_\_\_\_.  
a) .R     b) .S  
c) .Rp    d) .c

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Seat No.	
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Set	P
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**Fourth Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONIC AND TELECOMMUNICATION ENGINEERING**  
**Data Analytics**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR of the following:** **16**

- a) Explain the types of data analytics.
- b) Describe the Descriptive Qualitative & Quantitative scale types in details.
- c) Find the mean absolute deviation (MAD) and standard deviation of the following data set:  
3, 5, 6, 8, 11, 14, 17, and 24.
- d) What are the different kinds of problems in data quality? Explain any two with an example.
- e) Write a short note on Univariate Location and Dispersion statistics.

**Q.3 Solve any TWO of the following:** **12**

- a) Draw and explain the CRISP-DM Process.
- b) Consider a data set of the following numbers: 23, 13, 37, 16, 26, 35, 26, and 35. Calculate Mean, 1st Quartile, 2nd Quartile (Median) and 3rd Quartile. Also plot it graphically.
- c) Describe three Univariate Data Visualization charts with an example.

**Section – II**

**Q.4 Solve any FOUR of the following:** **16**

- a) Explain the features of R Programming.
- b) Write an R program to create a data frame having elements student\_name, student\_id, city\_name.
- c) Explain the differences between BI and Data Science.
- d) What are the challenges to big data visualization?
- e)

**Q.5 Solve any TWO of the following:** **12**

- a) Explain the data types in R.
- b) Write a short note on: Vectors, Arrays and Lists in R.
- c) Describe the challenges of the current analytical architecture for data scientists.

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**Fourth Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONIC AND TELECOMMUNICATION ENGINEERING**  
**Data Analytics**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR of the following:** **16**

- a) Explain the types of data analytics.
- b) Describe the Descriptive Qualitative & Quantitative scale types in details.
- c) Find the mean absolute deviation (MAD) and standard deviation of the following data set:  
3, 5, 6, 8, 11, 14, 17, and 24.
- d) What are the different kinds of problems in data quality? Explain any two with an example.
- e) Write a short note on Univariate Location and Dispersion statistics.

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- c) Describe three Univariate Data Visualization charts with an example.

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- a) Explain the features of R Programming.
- b) Write an R program to create a data frame having elements student\_name, student\_id, city\_name.
- c) Explain the differences between BI and Data Science.
- d) What are the challenges to big data visualization?
- e)

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- b) Write a short note on: Vectors, Arrays and Lists in R.
- c) Describe the challenges of the current analytical architecture for data scientists.

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- 9) \_\_\_\_\_ is the graphical representation of data where data is grouped into continuous number ranges and each range corresponds to a vertical bar.
- a) Line Chart
  - b) Bar Chart
  - c) Histogram
  - d) Pie Chart
- 10) Which of the following is true about outliers?
- a) Data points that deviate a lot from normal observations
  - b) Can reduce the accuracy of the model
  - c) Both a and b
  - d) None
- 11) Which of the following(s) is/are features scaling techniques?
- a) Standardization
  - b) Min-Max Scaling
  - c) Both a & b
  - d) None
- 12) R files has an extension \_\_\_\_\_.
- a) .R
  - b) .S
  - c) .Rp
  - d) .c
- 13) In the expression `x <- 4L` in R, what is the class of 'x' as determined by the 'class()' function?
- a) Complex
  - b) Numeric
  - c) Integer
  - d) Word
- 14) What will be the output of the following R function?
- ```
ab <- list(1, 2, 3, "X", "Y", "Z")
dim(ab) <- c(3,2)
print(ab)
```
- a) 1 "X"
  - b) 1 "X"
  - 2 "Y"
  - 2 "Y"
  - 3 "Z"
  - 3 "Y"
  - c) 1 "W"
  - d) Error
  - 2 "Y"
  - 3 "Z"

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| <b>Set</b> | <b>R</b> |
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**Fourth Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONIC AND TELECOMMUNICATION ENGINEERING**  
**Data Analytics**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR of the following:** **16**

- a) Explain the types of data analytics.
- b) Describe the Descriptive Qualitative & Quantitative scale types in details.
- c) Find the mean absolute deviation (MAD) and standard deviation of the following data set:  
3, 5, 6, 8, 11, 14, 17, and 24.
- d) What are the different kinds of problems in data quality? Explain any two with an example.
- e) Write a short note on Univariate Location and Dispersion statistics.

**Q.3 Solve any TWO of the following:** **12**

- a) Draw and explain the CRISP-DM Process.
- b) Consider a data set of the following numbers: 23, 13, 37, 16, 26, 35, 26, and 35. Calculate Mean, 1st Quartile, 2nd Quartile (Median) and 3rd Quartile. Also plot it graphically.
- c) Describe three Univariate Data Visualization charts with an example.

**Section – II**

**Q.4 Solve any FOUR of the following:** **16**

- a) Explain the features of R Programming.
- b) Write an R program to create a data frame having elements student\_name, student\_id, city\_name.
- c) Explain the differences between BI and Data Science.
- d) What are the challenges to big data visualization?
- e)

**Q.5 Solve any TWO of the following:** **12**

- a) Explain the data types in R.
- b) Write a short note on: Vectors, Arrays and Lists in R.
- c) Describe the challenges of the current analytical architecture for data scientists.

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Set **S**

**Fourth Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONIC AND TELECOMMUNICATION ENGINEERING**  
**Data Analytics**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is true about outliers?
  - a) Data points that deviate a lot from normal observations
  - b) Can reduce the accuracy of the model
  - c) Both a and b
  - d) None
- 2) Which of the following(s) is/are features scaling techniques?
  - a) Standardization
  - b) Min-Max Scaling
  - c) Both a & b
  - d) None
- 3) R files has an extension \_\_\_\_\_.
  - a) .R
  - b) .S
  - c) .Rp
  - d) .c
- 4) In the expression `x <- 4L` in R, what is the class of 'x' as determined by the 'class()' function?
  - a) Complex
  - b) Numeric
  - c) Integer
  - d) Word
- 5) What will be the output of the following R function?  

```
ab <- list(1, 2, 3, "X", "Y", "Z")
dim(ab) <- c(3,2)
print(ab)
```

  - a) 1 "X"  
2 "Y"  
3 "Z"
  - b) 1 "X"  
2 "Y"  
3 "Y"
  - c) 1 "W"  
2 "Y"  
3 "Z"
  - d) Error
- 6) Data that has no inherent structure, which may include text documents, PDFs, images, and video known as \_\_\_\_\_.
  - a) Structured data
  - b) Semi-structured data
  - c) Unstructured data
  - d) Quasi-structured data

- 7) Data scientists are generally thought of as having sets of skills and behavioral characteristics: \_\_\_\_\_.  
a) Quantitative skill                      b) Technical aptitude  
c) Communicative & collaborative      d) All of the mentioned
- 8) Which one of the following is not a problem for big data visualization?  
a) Visual noise                              b) Large image perception  
c) Low rate of image                      d) None of these
- 9) \_\_\_\_\_ used to plot individual data elements across many dimensions.  
a) Tree map                                  b) Cone tree  
c) Parallel coordinates                  d) Venn Diagram
- 10) In Big Data environments, Veracity makes sure that the data is \_\_\_\_\_.  
a) Accurate                                  b) Inconsistence  
c) Variant                                    d) None of the mentioned
- 11) The Big Data architecture is designed in such a way so that it can handle \_\_\_\_\_.  
a) Data ingestion                          b) Data processing  
c) Data analysis                          d) All
- 12) Diagnostic analytics answers the question.  
a) What happened?  
b) What is the best course of action?  
c) What is likely to happen?  
d) Why did it happen?
- 13) The type of a Nominal attribute depends on which of the following properties:  
a) Distinctness & order                  b) Order  
c) Distinctness                              d) None
- 14) \_\_\_\_\_ is the graphical representation of data where data is grouped into continuous number ranges and each range corresponds to a vertical bar.  
a) Line Chart                                  b) Bar Chart  
c) Histogram                                  d) Pie Chart

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**Fourth Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov -2022**  
**ELECTRONIC AND TELECOMMUNICATION ENGINEERING**  
**Data Analytics**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR of the following:** **16**

- a) Explain the types of data analytics.
- b) Describe the Descriptive Qualitative & Quantitative scale types in details.
- c) Find the mean absolute deviation (MAD) and standard deviation of the following data set:  
3, 5, 6, 8, 11, 14, 17, and 24.
- d) What are the different kinds of problems in data quality? Explain any two with an example.
- e) Write a short note on Univariate Location and Dispersion statistics.

**Q.3 Solve any TWO of the following:** **12**

- a) Draw and explain the CRISP-DM Process.
- b) Consider a data set of the following numbers: 23, 13, 37, 16, 26, 35, 26, and 35. Calculate Mean, 1st Quartile, 2nd Quartile (Median) and 3rd Quartile. Also plot it graphically.
- c) Describe three Univariate Data Visualization charts with an example.

**Section – II**

**Q.4 Solve any FOUR of the following:** **16**

- a) Explain the features of R Programming.
- b) Write an R program to create a data frame having elements student\_name, student\_id, city\_name.
- c) Explain the differences between BI and Data Science.
- d) What are the challenges to big data visualization?
- e)

**Q.5 Solve any TWO of the following:** **12**

- a) Explain the data types in R.
- b) Write a short note on: Vectors, Arrays and Lists in R.
- c) Describe the challenges of the current analytical architecture for data scientists.

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Set

P

**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**System Software**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Analysis which determines the meaning of a statement once its grammatical structure becomes known is termed as
  - a) Semantic analysis
  - b) Syntax analysis
  - c) Regular analysis
  - d) General analysis
- 2) Issues in lexical analysis.
  - a) Code optimization
  - b) Compiler portability and efficiency
  - c) Both
  - d) None
- 3) "less than 3" is
  - a) Literal token
  - b) Num token
  - c) Relation token
  - d) None
- 4) A parser which is a variant of top-down parsing without backtracking
  - a) Recursive Descend
  - b) Operator Precedence
  - c) LL (1) parser
  - d) LALR Parser
- 5) An assembler is
  - a) programming language dependent
  - b) syntax dependant
  - c) machine dependant
  - d) data dependant
- 6) The translator which perform macro expansion is called a
  - a) Macro processor
  - b) Macro pre-processor
  - c) Micro pre-processor
  - d) Assembler
- 7) Load address for the first word of the program is called
  - a) Linker address origin
  - b) Load address origin
  - c) Phase library
  - d) Absolute library
- 8) Which of the following statement is true
  - a) SLR parser is more powerful than LALR
  - b) LALR parser is more powerful than canonical LR parser
  - c) canonical LR parser is more powerful than LALR parser
  - d) parser SLR, canonical CR and LALR have the same power



- 9) Which of the following is used for grouping of characteristics into tokens
- a) Parser
  - b) Code optimization
  - c) Code generator
  - d) Lexical analyzer
- 10) Pee hole optimization is a form of
- a) Loop optimization
  - b) Local optimization
  - c) Constant folding
  - d) None of these
- 11) Loading come in picture at
- a) Compile time
  - b) Translation time
  - c) Execution
  - d) None
- 12) In rightmost derivation the rightmost \_\_\_\_\_ is replaced at each step.
- a) Terminal
  - b) Non-terminal
  - c) Both
  - d) None
- 13) In rightmost derivation the rightmost \_\_\_\_\_ is replaced at each step.
- a) Terminal
  - b) Non-terminal
  - c) Both
  - d) None
- 14) A linker program
- a) places the program in the memory for the purpose of execution
  - b) relocates the program to execute from the specific memory area
  - c) links the program with other programs needed for its execution
  - d) interfaces the program with the entities generating its input data

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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**System Software**

Day & Date: Wednesday 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following. (Any Three) 12**
- a) What are the language processor tools?
  - b) Discuss different parameter passing methods in MACRO.
  - c) Explain START, END, ORIGIN, EQU, LTORG with example.
  - d) What are token and symbol concepts in language processor?
- Q.3 Answer the following. (Any Two) 16**
- a) Explain Different ways of parsing.
  - b) Explain design of macro processor.
  - c) Write pass I process of two pass assembler with its data structure and files.

**Section – II**

- Q.4 Answer the following. (Any Three) 12**
- a) What are sources of optimization?
  - b) Compare 3 code optimization techniques.
  - c) Explain code generation from Dags and the dynamic code generation algorithm.
  - d) With example explain different files in linkers.
- Q.5 Answer the following (Any Two) 16**
- a) Explain in detail Subroutine linkages in loader.
  - b) Explain self relocating program.
  - c) With example explain linking for overlays

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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**System Software**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which of the following statement is true
  - a) SLR parser is more powerful than LALR
  - b) LALR parser is more powerful than canonical LR parser
  - c) canonical LR parser is more powerful than LALR parser
  - d) parser SLR, canonical CR and LALR have the same power
- 2) Which of the following is used for grouping of characteristics into tokens
  - a) Parser
  - b) Code optimization
  - c) Code generator
  - d) Lexical analyzer
- 3) Pee hole optimization is a form of
  - a) Loop optimization
  - b) Local optimization
  - c) Constant folding
  - d) None of these
- 4) Loading come in picture at
  - a) Compile time
  - b) Translation time
  - c) Execution
  - d) None
- 5) In rightmost derivation the rightmost \_\_\_\_\_ is replaced at each step.
  - a) Terminal
  - b) Non-terminal
  - c) Both
  - d) None
- 6) In rightmost derivation the rightmost \_\_\_\_\_ is replaced at each step.
  - a) Terminal
  - b) Non-terminal
  - c) Both
  - d) None
- 7) A linker program
  - a) places the program in the memory for the purpose of execution
  - b) relocates the program to execute from the specific memory area
  - c) links the program with other programs needed for its execution
  - d) interfaces the program with the entities generating its input data
- 8) Analysis which determines the meaning of a statement once its grammatical structure becomes known is termed as
  - a) Semantic analysis
  - b) Syntax analysis
  - c) Regular analysis
  - d) General analysis

- 9) Issues in lexical analysis.
- a) Code optimization
  - b) Compiler portability and efficiency
  - c) Both
  - d) None
- 10) "less than 3" is
- a) Literal token
  - b) Num token
  - c) Relation token
  - d) None
- 11) A parser which is a variant of top-down parsing without backtracking
- a) Recursive Descend
  - b) Operator Precedence
  - c) LL (1) parser
  - d) LALR Parser
- 12) An assembler is
- a) programming language dependent
  - b) syntax dependant
  - c) machine dependant
  - d) data dependant
- 13) The translator which perform macro expansion is called a
- a) Macro processor
  - b) Macro pre-processor
  - c) Micro pre-processor
  - d) Assembler
- 14) Load address for the first word of the program is called
- a) Linker address origin
  - b) Load address origin
  - c) Phase library
  - d) Absolute library

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**Set Q**

**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**System Software**

Day & Date: Wednesday 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following. (Any Three) 12**
- a) What are the language processor tools?
  - b) Discuss different parameter passing methods in MACRO.
  - c) Explain START, END, ORIGIN, EQU, LTORG with example.
  - d) What are token and symbol concepts in language processor?
- Q.3 Answer the following. (Any Two) 16**
- a) Explain Different ways of parsing.
  - b) Explain design of macro processor.
  - c) Write pass I process of two pass assembler with its data structure and files.

**Section – II**

- Q.4 Answer the following. (Any Three) 12**
- a) What are sources of optimization?
  - b) Compare 3 code optimization techniques.
  - c) Explain code generation from Dags and the dynamic code generation algorithm.
  - d) With example explain different files in linkers.
- Q.5 Answer the following (Any Two) 16**
- a) Explain in detail Subroutine linkages in loader.
  - b) Explain self relocating program.
  - c) With example explain linking for overlays

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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**System Software**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Loading come in picture at
  - a) Compile time
  - b) Translation time
  - c) Execution
  - d) None
- 2) In rightmost derivation the rightmost \_\_\_\_\_ is replaced at each step.
  - a) Terminal
  - b) Non-terminal
  - c) Both
  - d) None
- 3) In rightmost derivation the rightmost \_\_\_\_\_ is replaced at each step.
  - a) Terminal
  - b) Non-terminal
  - c) Both
  - d) None
- 4) A linker program
  - a) places the program in the memory for the purpose of execution
  - b) relocates the program to execute from the specific memory area
  - c) links the program with other programs needed for its execution
  - d) interfaces the program with the entities generating its input data
- 5) Analysis which determines the meaning of a statement once its grammatical structure becomes known is termed as
  - a) Semantic analysis
  - b) Syntax analysis
  - c) Regular analysis
  - d) General analysis
- 6) Issues in lexical analysis.
  - a) Code optimization
  - b) Compiler portability and efficiency
  - c) Both
  - d) None
- 7) "less than 3" is
  - a) Literal token
  - b) Num token
  - c) Relation token
  - d) None
- 8) A parser which is a variant of top-down parsing without backtracking
  - a) Recursive Descend
  - b) Operator Precedence
  - c) LL (1) parser
  - d) LALR Parser

- 9) An assembler is
- a) programming language dependent
  - b) syntax dependant
  - c) machine dependant
  - d) data dependant
- 10) The translator which perform macro expansion is called a
- a) Macro processor
  - b) Macro pre-processor
  - c) Micro pre-processor
  - d) Assembler
- 11) Load address for the first word of the program is called
- a) Linker address origin
  - b) Load address origin
  - c) Phase library
  - d) Absolute library
- 12) Which of the following statement is true
- a) SLR parser is more powerful than LALR
  - b) LALR parser is more powerful than canonical LR parser
  - c) canonical LR parser is more powerful than LALR parser
  - d) parser SLR, canonical CR and LALR have the same power
- 13) Which of the following is used for grouping of characteristics into tokens
- a) Parser
  - b) Code optimization
  - c) Code generator
  - d) Lexical analyzer
- 14) Pee hole optimization is a form of
- a) Loop optimization
  - b) Local optimization
  - c) Constant folding
  - d) None of these

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**Set R**

**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**System Software**

Day & Date: Wednesday 25-01-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following. (Any Three) 12**
- a) What are the language processor tools?
  - b) Discuss different parameter passing methods in MACRO.
  - c) Explain START, END, ORIGIN, EQU, LTORG with example.
  - d) What are token and symbol concepts in language processor?
- Q.3 Answer the following. (Any Two) 16**
- a) Explain Different ways of parsing.
  - b) Explain design of macro processor.
  - c) Write pass I process of two pass assembler with its data structure and files.

**Section – II**

- Q.4 Answer the following. (Any Three) 12**
- a) What are sources of optimization?
  - b) Compare 3 code optimization techniques.
  - c) Explain code generation from Dags and the dynamic code generation algorithm.
  - d) With example explain different files in linkers.
- Q.5 Answer the following (Any Two) 16**
- a) Explain in detail Subroutine linkages in loader.
  - b) Explain self relocating program.
  - c) With example explain linking for overlays



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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**System Software**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The translator which perform macro expansion is called a
  - a) Macro processor
  - b) Macro pre-processor
  - c) Micro pre-processor
  - d) Assembler
- 2) Load address for the first word of the program is called
  - a) Linker address origin
  - b) Load address origin
  - c) Phase library
  - d) Absolute library
- 3) Which of the following statement is true
  - a) SLR parser is more powerful than LALR
  - b) LALR parser is more powerful than canonical LR parser
  - c) canonical LR parser is more powerful than LALR parser
  - d) parser SLR, canonical CR and LALR have the same power
- 4) Which of the following is used for grouping of characteristics into tokens
  - a) Parser
  - b) Code optimization
  - c) Code generator
  - d) Lexical analyzer
- 5) Pee hole optimization is a form of
  - a) Loop optimization
  - b) Local optimization
  - c) Constant folding
  - d) None of these
- 6) Loading come in picture at
  - a) Compile time
  - b) Translation time
  - c) Execution
  - d) None
- 7) In rightmost derivation the rightmost \_\_\_\_\_ is replaced at each step.
  - a) Terminal
  - b) Non-terminal
  - c) Both
  - d) None
- 8) In rightmost derivation the rightmost \_\_\_\_\_ is replaced at each step.
  - a) Terminal
  - b) Non-terminal
  - c) Both
  - d) None

- 9) A linker program
- a) places the program in the memory for the purpose of execution
  - b) relocates the program to execute from the specific memory area
  - c) links the program with other programs needed for its execution
  - d) interfaces the program with the entities generating its input data
- 10) Analysis which determines the meaning of a statement once its grammatical structure becomes known is termed as
- a) Semantic analysis
  - b) Syntax analysis
  - c) Regular analysis
  - d) General analysis
- 11) Issues in lexical analysis.
- a) Code optimization
  - b) Compiler portability and efficiency
  - c) Both
  - d) None
- 12) "less than 3" is
- a) Literal token
  - b) Num token
  - c) Relation token
  - d) None
- 13) A parser which is a variant of top-down parsing without backtracking
- a) Recursive Descend
  - b) Operator Precedence
  - c) LL (1) parser
  - d) LALR Parser
- 14) An assembler is
- a) programming language dependent
  - b) syntax dependant
  - c) machine dependant
  - d) data dependant

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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**System Software**

Day & Date: Wednesday 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following. (Any Three) 12**
- What are the language processor tools?
  - Discuss different parameter passing methods in MACRO.
  - Explain START, END, ORIGIN, EQU, LTORG with example.
  - What are token and symbol concepts in language processor?
- Q.3 Answer the following. (Any Two) 16**
- Explain Different ways of parsing.
  - Explain design of macro processor.
  - Write pass I process of two pass assembler with its data structure and files.

**Section – II**

- Q.4 Answer the following. (Any Three) 12**
- What are sources of optimization?
  - Compare 3 code optimization techniques.
  - Explain code generation from Dags and the dynamic code generation algorithm.
  - With example explain different files in linkers.
- Q.5 Answer the following (Any Two) 16**
- Explain in detail Subroutine linkages in loader.
  - Explain self relocating program.
  - With example explain linking for overlays

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is the main function of the command interpreter?
  - a) to handle the files in operating system
  - b) to provide the interface between the API and application program
  - c) to get and execute the next user-specified command
  - d) none of these
- 2) The systems which allow only one process execution at a time, are called \_\_\_\_\_.
  - a) Uniprogramming systems
  - b) Unitasking systems
  - c) Uniprocessing systems
  - d) none of these
- 3) A process stack does not contain \_\_\_\_\_.
  - a) Function parameters
  - b) Local variables
  - c) PID of child process
  - d) Return addresses
- 4) The state of a process is defined by the \_\_\_\_\_.
  - a) current activity of the process
  - b) activity just executed by the process
  - c) activity to next be executed by the process
  - d) final activity of the process
- 5) A semaphore is a shared integer variable that can not \_\_\_\_\_.
  - a) be more than one
  - b) be more than zero
  - c) drop below one
  - d) drop below zero
- 6) Process synchronization can be done on \_\_\_\_\_.
  - a) hardware level
  - b) software level
  - c) both a & b
  - d) none of these
- 7) Which module gives control of the CPU to the process selected by the short term scheduler?
  - a) interrupt
  - b) dispatcher
  - c) scheduler
  - d) none of these

- 8) A process is selected from the \_\_\_\_\_ queue by the \_\_\_\_\_ scheduler, to be executed
- a) ready, short term
  - b) wait, long term
  - c) blocked, short term
  - d) ready, long term
- 9) Semaphores are mostly used to implement \_\_\_\_\_.
- a) System calls
  - b) System protection
  - c) IPC mechanisms
  - d) None of these
- 10) An edge from process  $P_i$  to  $P_j$  in a wait for graph indicates that \_\_\_\_\_.
- a)  $P_j$  is waiting for  $P_i$  to leave the system
  - b)  $P_j$  is waiting for  $P_i$  to release a resource that  $P_j$  needs
  - c)  $P_i$  is waiting for  $P_j$  to leave the system
  - d)  $P_i$  is waiting for  $P_j$  to release a resource that  $P_i$  needs
- 11) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
- a) paging
  - b) fragmentation
  - c) mapping
  - d) none of these
- 12) The operating system maintains a \_\_\_\_\_ table that keeps track of how many frames have been allocated, how many are there, and how many are available.
- a) page
  - b) mapping
  - c) memory
  - d) frame
- 13) The interrupt vector contains the \_\_\_\_\_.
- a) Interrupts
  - b) device addresses
  - c) identifiers of interrupts
  - d) memory addresses of specialized interrupt handlers
- 14) In paging the user provides only \_\_\_\_\_ which is partitioned by the hardware into \_\_\_\_\_ and \_\_\_\_\_.
- a) one address, page number, offset
  - b) one offset, page number, address
  - c) page number, offset, address
  - d) none of these

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Sections are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.  
 4) Figure must be draw wherever necessary.

**Section – I**

- Q.2 Attempt any three.** **12**
- Illustrate the multi-programmed Batch System and time sharing system?
  - Extend the following w.r.t. to process.
    - Process states
    - Process control block
  - Explain in detail the Inter-Process communication?
  - Identify with example dining philosopher's solution using semaphore?
- Q.3 Attempt any one** **08**
- Examine with example the Critical-Section Problem with Peterson's Solution.
- OR**
- Illustrate the Multilevel Queue Scheduling and Multilevel Feedback Queue Scheduling with example.
- Q.4 Write short note on. (Any two)** **08**
- The Reader-writers problem
  - Threads
  - Operations on processes

**Section – II**

- Q.5 Attempt any three.** **12**
- Extend with example the single and multiple instance resource type.
  - What is thrashing? Explain with example.
  - State and explain the necessary conditions for preventing the deadlock.
  - Explain with figure interrupt driven I/O cycle.
- Q.6 Attempt any one** **08**
- Examine the need for page replacement with FIFO, Optimal and LRU page replacement algorithms.
- OR**
- Explain the following w.r.t. memory management.
    - Basic hardware
    - Address binding
    - Logical vs physical address space

- Q.7 Attempt the following. (Any Two).**
- a)** Unix commands ls, cat and cp
  - b)** Resource allocation graph
  - c)** Segmentation

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A process is selected from the \_\_\_\_\_ queue by the \_\_\_\_\_ scheduler, to be executed
  - a) ready, short term
  - b) wait, long term
  - c) blocked, short term
  - d) ready, long term
- 2) Semaphores are mostly used to implement \_\_\_\_\_.
  - a) System calls
  - b) System protection
  - c) IPC mechanisms
  - d) None of these
- 3) An edge from process P<sub>i</sub> to P<sub>j</sub> in a wait for graph indicates that \_\_\_\_\_.
  - a) P<sub>j</sub> is waiting for P<sub>i</sub> to leave the system
  - b) P<sub>j</sub> is waiting for P<sub>i</sub> to release a resource that P<sub>j</sub> needs
  - c) P<sub>i</sub> is waiting for P<sub>j</sub> to leave the system
  - d) P<sub>i</sub> is waiting for P<sub>j</sub> to release a resource that P<sub>i</sub> needs
- 4) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
  - a) paging
  - b) fragmentation
  - c) mapping
  - d) none of these
- 5) The operating system maintains a \_\_\_\_\_ table that keeps track of how many frames have been allocated, how many are there, and how many are available.
  - a) page
  - b) mapping
  - c) memory
  - d) frame
- 6) The interrupt vector contains the \_\_\_\_\_.
  - a) Interrupts
  - b) device addresses
  - c) identifiers of interrupts
  - d) memory addresses of specialized interrupt handlers
- 7) In paging the user provides only \_\_\_\_\_ which is partitioned by the hardware into \_\_\_\_\_ and \_\_\_\_\_.
  - a) one address, page number, offset
  - b) one offset, page number, address
  - c) page number, offset, address
  - d) none of these



- 8) What is the main function of the command interpreter?
- a) to handle the files in operating system
  - b) to provide the interface between the API and application program
  - c) to get and execute the next user-specified command
  - d) none of these
- 9) The systems which allow only one process execution at a time, are called \_\_\_\_.
- a) Uniprogramming systems
  - b) Unitasking systems
  - c) Uniprocessing systems
  - d) none of these
- 10) A process stack does not contain \_\_\_\_.
- a) Function parameters
  - b) Local variables
  - c) PID of child process
  - d) Return addresses
- 11) The state of a process is defined by the \_\_\_\_.
- a) current activity of the process
  - b) activity just executed by the process
  - c) activity to next be executed by the process
  - d) final activity of the process
- 12) A semaphore is a shared integer variable that can not \_\_\_\_.
- a) be more than one
  - b) be more than zero
  - c) drop below one
  - d) drop below zero
- 13) Process synchronization can be done on \_\_\_\_.
- a) hardware level
  - b) software level
  - c) both a & b
  - d) none of these
- 14) Which module gives control of the CPU to the process selected by the short term scheduler?
- a) interrupt
  - b) dispatcher
  - c) scheduler
  - d) none of these

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Sections are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.  
 4) Figure must be draw wherever necessary.

**Section – I**

- Q.2 Attempt any three.** **12**
- Illustrate the multi-programmed Batch System and time sharing system?
  - Extend the following w.r.t. to process.
    - Process states
    - Process control block
  - Explain in detail the Inter-Process communication?
  - Identify with example dining philosopher's solution using semaphore?
- Q.3 Attempt any one** **08**
- Examine with example the Critical-Section Problem with Peterson's Solution.
- OR**
- Illustrate the Multilevel Queue Scheduling and Multilevel Feedback Queue Scheduling with example.
- Q.4 Write short note on. (Any two)** **08**
- The Reader-writers problem
  - Threads
  - Operations on processes

**Section – II**

- Q.5 Attempt any three.** **12**
- Extend with example the single and multiple instance resource type.
  - What is thrashing? Explain with example.
  - State and explain the necessary conditions for preventing the deadlock.
  - Explain with figure interrupt driven I/O cycle.
- Q.6 Attempt any one** **08**
- Examine the need for page replacement with FIFO, Optimal and LRU page replacement algorithms.
- OR**
- Explain the following w.r.t. memory management.
    - Basic hardware
    - Address binding
    - Logical vs physical address space

- Q.7 Attempt the following. (Any Two).**
- a)** Unix commands ls, cat and cp
  - b)** Resource allocation graph
  - c)** Segmentation

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
  - a) paging
  - b) fragmentation
  - c) mapping
  - d) none of these
- 2) The operating system maintains a \_\_\_\_\_ table that keeps track of how many frames have been allocated, how many are there, and how many are available.
  - a) page
  - b) mapping
  - c) memory
  - d) frame
- 3) The interrupt vector contains the \_\_\_\_\_.
  - a) Interrupts
  - b) device addresses
  - c) identifiers of interrupts
  - d) memory addresses of specialized interrupt handlers
- 4) In paging the user provides only \_\_\_\_\_ which is partitioned by the hardware into \_\_\_\_\_ and \_\_\_\_\_.
  - a) one address, page number, offset
  - b) one offset, page number, address
  - c) page number, offset, address
  - d) none of these
- 5) What is the main function of the command interpreter?
  - a) to handle the files in operating system
  - b) to provide the interface between the API and application program
  - c) to get and execute the next user-specified command
  - d) none of these
- 6) The systems which allow only one process execution at a time, are called \_\_\_\_\_.
  - a) Uniprogramming systems
  - b) Unitasking systems
  - c) Uniprocessing systems
  - d) none of these
- 7) A process stack does not contain \_\_\_\_\_.
  - a) Function parameters
  - b) Local variables
  - c) PID of child process
  - d) Return addresses

- 8) The state of a process is defined by the \_\_\_\_\_.  
a) current activity of the process  
b) activity just executed by the process  
c) activity to next be executed by the process  
d) final activity of the process
- 9) A semaphore is a shared integer variable that can not \_\_\_\_\_.  
a) be more than one  
b) be more than zero  
c) drop below one  
d) drop below zero
- 10) Process synchronization can be done on \_\_\_\_\_.  
a) hardware level  
b) software level  
c) both a & b  
d) none of these
- 11) Which module gives control of the CPU to the process selected by the short term scheduler?  
a) interrupt  
b) dispatcher  
c) scheduler  
d) none of these
- 12) A process is selected from the \_\_\_\_\_ queue by the \_\_\_\_\_ scheduler, to be executed  
a) ready, short term  
b) wait, long term  
c) blocked, short term  
d) ready, long term
- 13) Semaphores are mostly used to implement \_\_\_\_\_.  
a) System calls  
b) System protection  
c) IPC mechanisms  
d) None of these
- 14) An edge from process  $P_i$  to  $P_j$  in a wait for graph indicates that \_\_\_\_\_.  
a)  $P_j$  is waiting for  $P_i$  to leave the system  
b)  $P_j$  is waiting for  $P_i$  to release a resource that  $P_j$  needs  
c)  $P_i$  is waiting for  $P_j$  to leave the system  
d)  $P_i$  is waiting for  $P_j$  to release a resource that  $P_i$  needs

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
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Max. Marks: 56

- Instructions:** 1) Both Sections are compulsory.  
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**Section – I**

- Q.2 Attempt any three.** **12**
- Illustrate the multi-programmed Batch System and time sharing system?
  - Extend the following w.r.t. to process.
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    - Process control block
  - Explain in detail the Inter-Process communication?
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- Q.3 Attempt any one** **08**
- Examine with example the Critical-Section Problem with Peterson's Solution.
- OR**
- Illustrate the Multilevel Queue Scheduling and Multilevel Feedback Queue Scheduling with example.
- Q.4 Write short note on. (Any two)** **08**
- The Reader-writers problem
  - Threads
  - Operations on processes

**Section – II**

- Q.5 Attempt any three.** **12**
- Extend with example the single and multiple instance resource type.
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  - State and explain the necessary conditions for preventing the deadlock.
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    - Logical vs physical address space

- Q.7 Attempt the following. (Any Two).**
- a)** Unix commands ls, cat and cp
  - b)** Resource allocation graph
  - c)** Segmentation

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c) drop below one      d) drop below zero

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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Operating Systems**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Sections are compulsory.  
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**Section – I**

- Q.2 Attempt any three.** **12**
- Illustrate the multi-programmed Batch System and time sharing system?
  - Extend the following w.r.t. to process.
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    - Process control block
  - Explain in detail the Inter-Process communication?
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- Illustrate the Multilevel Queue Scheduling and Multilevel Feedback Queue Scheduling with example.
- Q.4 Write short note on. (Any two)** **08**
- The Reader-writers problem
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  - Operations on processes

**Section – II**

- Q.5 Attempt any three.** **12**
- Extend with example the single and multiple instance resource type.
  - What is thrashing? Explain with example.
  - State and explain the necessary conditions for preventing the deadlock.
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- Q.6 Attempt any one** **08**
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    - Address binding
    - Logical vs physical address space

**Q.7 Attempt the following. (Any Two).**

- a)** Unix commands ls, cat and cp
- b)** Resource allocation graph
- c)** Segmentation

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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- 1) A functional dependency is a relationship between or among \_\_\_\_\_.  
a) Attributes                                      b) Tables  
c) Entities                                         d) Rows
- 2) Which of the following statement is TRUE regarding CREATE TABLE statement?  
a) CREATE table replaces the existing table if it already exists  
b) Attributes default to NUMBER data type if data type is not provided  
c) Attributes allow NULL values unless NOT NULL clause is provided  
d) DEFAULT clause can only be provided for NOT NULL attributes
- 3) Given the employee table as input, choose the query that displays department wise average salaries sorted in descending order.

| ID | ENAME         | DEPT | SALARY |
|----|---------------|------|--------|
| 1  | James Potter  | FSI  | 75000  |
| 2  | Ethan McCarty | ETA  | 90000  |
| 3  | Emily Rayner  | ETA  | 25000  |
| 4  | Jack Abraham  | ETA  | 30000  |

- `SELECT AVG (Salary) AvgSal, Dept FROM Employee GROUP BY Dept ORDER BY 1;`
- `SELECT AVG(Salary) AvgSal, Dept FROM Employee ORDER BY AVG(Salary) GROUP BY Dept;`
- `SELECT AVG(Salary) as AvgSal, Dept FROM Employee GROUP BY Dept ORDER BY AvgSal DESC;`
- `SELECT Dept, AVG(Salary) AvgSal FROM Employee GROUP BY 1 ORDER BY 2 DESC;`



Which of the following statement is true?

- a) The above schedule is irrecoverable.
- b) The above schedule is recoverable with cascading rollback.
- c) The above schedule is cascadeless recoverable.
- d) It cannot be determined from the given schedule whether cascading roll back is required in case it is recoverable.

**12)** Identify the correct mechanism to ensure the isolation property of a set of transactions.

- a) Recovery manager
- b) Concurrency control system
- c) Security management system
- d) Query optimization techniques

**13)** When a transaction completes the execution of its final statement, it enters \_\_\_\_\_ state.

- a) partially Committed
- b) Committed
- c) Failed
- d) Aborted

**14)** Consider the relation scheme  $R = \{E, F, G, H, I, J, K, L, M, N\}$  and the set of functional dependencies

$\{ \{E, F\} \rightarrow \{G\}, \{F\} \rightarrow \{I, J\}, \{E, H\} \rightarrow \{K, L\}, K \rightarrow \{M\}, L \rightarrow \{N\} \}$  on R.

What is the candidate key for R?

- a)  $\{E, F\}$
- b)  $\{E, F, H\}$
- c)  $\{E, F, H, K, L\}$
- d)  $\{E\}$

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Database Engineering**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** Both Section are compulsory.

**Section – I**

- Q.2 Answer any three questions. 12**
- a) What are constraints? Discuss with respect to Domain Constraints, Referential Integrity, Assertions and Authorization.
  - b) What are aggregate functions? Give examples.
  - c) Define mapping cardinalities. What are the possible mapping cardinalities for a binary relationship? Explain with example.
  - d) Describe types of attributes with example.
- Q.3 What are the different types of SQL joins? Describe Inner Join & Full Outer Join with example. 08**
- Q.4 What is Normalization? Describe 3NF in detail. 08**

**Section – II**

- Q.5 Answer any three questions. 12**
- a) Describe ACID properties of a transaction with example.
  - b) Describe the advantages of concurrent execution of schedules over serial execution.
  - c) Discuss the concept of conflict and view serializability.
  - d) What is lock? Describe the types of locks in concurrency control.
- Q.6 Describe Recoverable Schedules and Cascadeless Schedules in detail. 08**
- Q.7 What is Deadlock? Discuss in detail the different ways of preventing deadlocks and detecting deadlock. 08**

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Database Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In a \_\_\_\_\_ clustering index, the index record contains the search-key value and a pointer to the first data record with that search-key value. The rest of the records with the same search-key value would be stored sequentially after the first record.
  - a) Dense
  - b) Sparse
  - c) Straight
  - d) Continuous
- 2) The assumption that hardware errors and bugs in the software bring the system to a halt, but do not corrupt the nonvolatile storage contents, is known as \_\_\_\_\_.
  - a) Fails-stop assumption
  - b) System crash
  - c) Disk failure
  - d) All of the mentioned
- 3) \_\_\_\_\_ is either all operations of the transaction are reflected properly in the database, or none are.
  - a) Atomicity
  - b) Consistency
  - c) Isolation
  - d) Durability
- 4) Consider the following schedule involving two transactions:

| T1     | T2     |
|--------|--------|
| R(x)   |        |
|        | R(y)   |
| W(x)   |        |
| commit |        |
|        | R(x)   |
|        | commit |

Which of the following statement is true?

- a) The above schedule is irrecoverable.
- b) The above schedule is recoverable with cascading rollback.
- c) The above schedule is cascadeless recoverable.
- d) It cannot be determined from the given schedule whether cascading roll back is required in case it is recoverable.



- 5) Identify the correct mechanism to ensure the isolation property of a set of transactions.
- a) Recovery manager                      b) Concurrency control system  
c) Security management system      d) Query optimization techniques
- 6) When a transaction completes the execution of its final statement, it enters \_\_\_\_\_ state.
- a) partially Committed                      b) Committed  
c) Failed                                          d) Aborted
- 7) Consider the relation scheme  $R = \{E, F, G, H, I, J, K, L, M, N\}$  and the set of functional dependencies  $\{ \{E, F\} \rightarrow \{G\}, \{F\} \rightarrow \{I, J\}, \{E, H\} \rightarrow \{K, L\}, K \rightarrow \{M\}, L \rightarrow \{N\} \}$  on R. What is the candidate key for R?
- a)  $\{E, F\}$                                           b)  $\{E, F, H\}$   
c)  $\{E, F, H, K, L\}$                               d)  $\{E\}$
- 8) A functional dependency is a relationship between or among \_\_\_\_\_.
- a) Attributes                                      b) Tables  
c) Entities                                          d) Rows
- 9) Which of the following statement is TRUE regarding CREATE TABLE statement?
- a) CREATE table replaces the existing table if it already exists  
b) Attributes default to NUMBER data type if data type is not provided  
c) Attributes allow NULL values unless NOT NULL clause is provided  
d) DEFAULT clause can only be provided for NOT NULL attributes
- 10) Given the employee table as input, choose the query that displays department wise average salaries sorted in descending order.

| ID | ENAME         | DEPT | SALARY |
|----|---------------|------|--------|
| 1  | James Potter  | FSI  | 75000  |
| 2  | Ethan McCarty | ETA  | 90000  |
| 3  | Emily Rayner  | ETA  | 25000  |
| 4  | Jack Abraham  | ETA  | 30000  |

- a) SELECT AVG (Salary) AvgSal, Dept FROM Employee GROUP BY Dept ORDER BY 1;  
b) SELECT AVG(Salary) AvgSal, Dept FROM Employee ORDER BY AVG(Salary) GROUP BY Dept;  
c) SELECT AVG(Salary) as AvgSal, Dept FROM Employee GROUP BY Dept ORDER BY AvgSal DESC;  
d) SELECT Dept, AVG(Salary) AvgSal FROM Employee GROUP BY 1 ORDER BY 2 DESC;
- 11) An entity set that does not have sufficient attributes to form a primary key is a \_\_\_\_\_.
- a) Strong entity set                              b) Weak entity set  
c) Simple entity set                              d) Primary entity set
- 12) The relationship between the two tables is created using \_\_\_\_\_.
- a) Candidate Key                                  b) Primary Key  
c) Foreign Key                                      d) Constraint

**13)** Which of the following statement(s) is/are FALSE about order by clause?

- a) Order by can be used with DATE attributes
- b) Order by default sort is ascending order
- c) Where clause can be used after order by clause
- d) All of these

**14)** Consider the following schedule for transactions T1, T2 and T3:

| T1        | T2        | T3        |
|-----------|-----------|-----------|
| Read (X)  |           |           |
|           | Read (Y)  |           |
|           |           | Read (Y)  |
|           | Write (Y) |           |
| Write (X) |           |           |
|           |           | Write (X) |
|           | Read (X)  |           |
|           | Write (X) |           |

Which option is the correct serialization of the above schedule?

- a) T1 → T3 → T2
- b) T2 → T1 → T3
- c) T2 → T3 → T1
- d) T3 → T1 → T2

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Database Engineering**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** Both Section are compulsory.

**Section – I**

- Q.2 Answer any three questions. 12**
- a) What are constraints? Discuss with respect to Domain Constraints, Referential Integrity, Assertions and Authorization.
  - b) What are aggregate functions? Give examples.
  - c) Define mapping cardinalities. What are the possible mapping cardinalities for a binary relationship? Explain with example.
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- Q.3 What are the different types of SQL joins? Describe Inner Join & Full Outer Join with example. 08**
- Q.4 What is Normalization? Describe 3NF in detail. 08**

**Section – II**

- Q.5 Answer any three questions. 12**
- a) Describe ACID properties of a transaction with example.
  - b) Describe the advantages of concurrent execution of schedules over serial execution.
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Database Engineering**

Day & Date: Friday, 24-02-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

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| R(x)   |        |
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- partially Committed
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  - $\{E, F, H, K, L\}$
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- Attributes
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- 6) Which of the following statement is TRUE regarding CREATE TABLE statement?
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  - Weak entity set
  - Simple entity set
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- 9) The relationship between the two tables is created using \_\_\_\_\_.  
  - Candidate Key
  - Primary Key
  - Foreign Key
  - Constraint
- 10) Which of the following statement(s) is/are FALSE about order by clause?  
  - Order by can be used with DATE attributes
  - Order by default sort is ascending order
  - Where clause can be used after order by clause
  - All of these
- 11) Consider the following schedule for transactions T1, T2 and T3:

| T1        | T2        | T3        |
|-----------|-----------|-----------|
| Read (X)  |           |           |
|           | Read (Y)  |           |
|           |           | Read (Y)  |
|           | Write (Y) |           |
| Write (X) |           |           |
|           |           | Write (X) |
|           | Read (X)  |           |
|           | Write (X) |           |

Which option is the correct serialization of the above schedule?

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| a) $T1 \rightarrow T3 \rightarrow T2$ | b) $T2 \rightarrow T1 \rightarrow T3$ |
| c) $T2 \rightarrow T3 \rightarrow T1$ | d) $T3 \rightarrow T1 \rightarrow T2$ |

- 12)** In a \_\_\_\_\_ clustering index, the index record contains the search-key value and a pointer to the first data record with that search-key value. The rest of the records with the same search-key value would be stored sequentially after the first record.

- |             |               |
|-------------|---------------|
| a) Dense    | b) Sparse     |
| c) Straight | d) Continuous |

- 13)** The assumption that hardware errors and bugs in the software bring the system to a halt, but do not corrupt the nonvolatile storage contents, is known as \_\_\_\_\_.

- |                          |                         |
|--------------------------|-------------------------|
| a) Fails-stop assumption | b) System crash         |
| c) Disk failure          | d) All of the mentioned |

- 14)** \_\_\_\_\_ is either all operations of the transaction are reflected properly in the database, or none are.

- |              |                |
|--------------|----------------|
| a) Atomicity | b) Consistency |
| c) Isolation | d) Durability  |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Database Engineering**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** Both Section are compulsory.

**Section – I**

- Q.2 Answer any three questions. 12**
- a) What are constraints? Discuss with respect to Domain Constraints, Referential Integrity, Assertions and Authorization.
  - b) What are aggregate functions? Give examples.
  - c) Define mapping cardinalities. What are the possible mapping cardinalities for a binary relationship? Explain with example.
  - d) Describe types of attributes with example.
- Q.3 What are the different types of SQL joins? Describe Inner Join & Full Outer Join with example. 08**
- Q.4 What is Normalization? Describe 3NF in detail. 08**

**Section – II**

- Q.5 Answer any three questions. 12**
- a) Describe ACID properties of a transaction with example.
  - b) Describe the advantages of concurrent execution of schedules over serial execution.
  - c) Discuss the concept of conflict and view serializability.
  - d) What is lock? Describe the types of locks in concurrency control.
- Q.6 Describe Recoverable Schedules and Cascadeless Schedules in detail. 08**
- Q.7 What is Deadlock? Discuss in detail the different ways of preventing deadlocks and detecting deadlock. 08**

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Database Engineering**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following statement(s) is/are FALSE about order by clause?  
 a) Order by can be used with DATE attributes  
 b) Order by default sort is ascending order  
 c) Where clause can be used after order by clause  
 d) All of these
- 2) Consider the following schedule for transactions T1, T2 and T3:

| T1        | T2        | T3        |
|-----------|-----------|-----------|
| Read (X)  |           |           |
|           | Read (Y)  |           |
|           |           | Read (Y)  |
|           | Write (Y) |           |
| Write (X) |           |           |
|           |           | Write (X) |
|           | Read (X)  |           |
|           | Write (X) |           |

Which option is the correct serialization of the above schedule?

- a) T1 → T3 → T2                      b) T2 → T1 → T3  
 c) T2 → T3 → T1                      d) T3 → T1 → T2
- 3) In a \_\_\_\_\_ clustering index, the index record contains the search-key value and a pointer to the first data record with that search-key value. The rest of the records with the same search-key value would be stored sequentially after the first record.  
 a) Dense                                      b) Sparse  
 c) Straight                                      d) Continuous
- 4) The assumption that hardware errors and bugs in the software bring the system to a halt, but do not corrupt the nonvolatile storage contents, is known as \_\_\_\_\_.  
 a) Fails-stop assumption                      b) System crash  
 c) Disk failure                                      d) All of the mentioned



- 5) \_\_\_\_\_ is either all operations of the transaction are reflected properly in the database, or none are.
- |              |                |
|--------------|----------------|
| a) Atomicity | b) Consistency |
| c) Isolation | d) Durability  |

- 6)** Consider the following schedule involving two transactions:

|        |        |
|--------|--------|
| T1     | T2     |
| R(x)   |        |
|        | R(y)   |
| W(x)   |        |
| commit |        |
|        | R(x)   |
|        | commit |

Which of the following statement is true?

- a) The above schedule is irrecoverable.
  - b) The above schedule is recoverable with cascading rollback.
  - c) The above schedule is cascadeless recoverable.
  - d) It cannot be determined from the given schedule whether cascading roll back is required in case it is recoverable.
- 7) Identify the correct mechanism to ensure the isolation property of a set of transactions.
- a) Recovery manager
  - b) Concurrency control system
  - c) Security management system
  - d) Query optimization techniques
- 8) When a transaction completes the execution of its final statement, it enters \_\_\_\_\_ state.
- a) partially Committed
  - b) Committed
  - c) Failed
  - d) Aborted
- 9) Consider the relation scheme  $R = \{E, F, G, H, I, J, K, L, M, N\}$  and the set of functional dependencies  $\{E, F\} \rightarrow \{G\}, \{F\} \rightarrow \{I, J\}, \{E, H\} \rightarrow \{K, L\}, K \rightarrow \{M\}, L \rightarrow \{N\}$  on R. What is the candidate key for R?
- a)  $\{E, F\}$
  - b)  $\{E, F, H\}$
  - c)  $\{E, F, H, K, L\}$
  - d)  $\{E\}$
- 10) A functional dependency is a relationship between or among \_\_\_\_\_.
- a) Attributes
  - b) Tables
  - c) Entities
  - d) Rows
- 11) Which of the following statement is TRUE regarding CREATE TABLE statement?
- a) CREATE table replaces the existing table if it already exists
  - b) Attributes default to NUMBER data type if data type is not provided
  - c) Attributes allow NULL values unless NOT NULL clause is provided
  - d) DEFAULT clause can only be provided for NOT NULL attributes

12) Given the employee table as input, choose the query that displays department wise average salaries sorted in descending order.

| ID | ENAME         | DEPT | SALARY |
|----|---------------|------|--------|
| 1  | James Potter  | FSI  | 75000  |
| 2  | Ethan McCarty | ETA  | 90000  |
| 3  | Emily Rayner  | ETA  | 25000  |
| 4  | Jack Abraham  | ETA  | 30000  |

- a) SELECT AVG (Salary) AvgSal, Dept FROM Employee GROUP BY Dept ORDER BY 1;
  - b) SELECT AVG(Salary) AvgSal, Dept FROM Employee ORDER BY AVG(Salary) GROUP BY Dept;
  - c) SELECT AVG(Salary) as AvgSal, Dept FROM Employee GROUP BY Dept ORDER BY AvgSal DESC;
  - d) SELECT Dept, AVG(Salary) AvgSal FROM Employee GROUP BY 1 ORDER BY 2 DESC;
- 13)** An entity set that does not have sufficient attributes to form a primary key is a \_\_\_\_\_.
- a) Strong entity set
  - b) Weak entity set
  - c) Simple entity set
  - d) Primary entity set
- 14)** The relationship between the two tables is created using \_\_\_\_\_.
- a) Candidate Key
  - b) Primary Key
  - c) Foreign Key
  - d) Constraint

**SLR-HL-298**

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Database Engineering**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** Both Section are compulsory.

**Section – I**

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- a) What are constraints? Discuss with respect to Domain Constraints, Referential Integrity, Assertions and Authorization.
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- Q.4 What is Normalization? Describe 3NF in detail. 08**

**Section – II**

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- a) Describe ACID properties of a transaction with example.
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  - d) What is lock? Describe the types of locks in concurrency control.
- Q.6 Describe Recoverable Schedules and Cascadeless Schedules in detail. 08**
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No.**

Max. Marks: 70

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### MCQ/Objective Type Questions

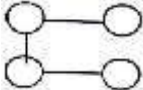
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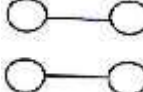
Marks: 14

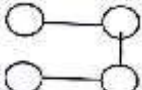
**Q.1 Choose the correct alternatives from the options.**

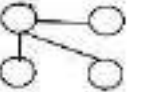
14

- 1)** Asymptotic behaviour of the given function  $f(n) = 4n^2 + 97n + 1000$  is \_\_\_\_\_.
  - a)  $O(2^n)$
  - b)  $O(n \log n)$
  - c)  $O(n)$
  - d)  $O(n^2)$
  
- 2)** Two main measures for the efficiency of an algorithm are \_\_\_\_\_.
  - a) Processor and memory
  - b) Complexity and capacity
  - c) Time and space
  - d) Data and space
  
- 3)** If Deadlines are (2, 2, 3, 3, 3) of 5 jobs, how many maximum jobs can be completed?
  - a) 2
  - b) 3
  - c) 4
  - d) 5
  
- 4)** Kruskal's algorithm is for finding \_\_\_\_\_.
  - a) All pairs shortest path
  - b) Single source shortest path
  - c) Minimum cost spanning tree
  - d) Minimum cost tour
  
- 5)** Which of the following statement shows correct relationship?
  - a)  $O(\log n) < O(n) < o(n \log n) < O(2^n) < O(n^2)$
  - b)  $O(n) < O(\log n) < o(n \log n) < O(n^2) < O(2^n)$
  - c)  $O(n) < O(\log n) < o(n \log n) < O(2^n) < O(n^2)$
  - d)  $O(\log n) < O(n) < o(n \log n) < O(n^2) < O(2^n)$
  
- 6)** Which of the following is not spanning tree for a graph with 4 vertices?
 

a) 

c) 

b) 

d) 

-

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY**  
**Design and Analysis of Algorithms**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any three.**

**12**

- Sort the following array using merge sort.  
100, 200, 50, 90, 150, 50, 20, 80
- Show that following equality is incorrect  
 $10n^2 + 9 = O(n)$
- Find 3<sup>rd</sup> smallest element from the array using divide and conquer.  
310, 285, 179, 652, 351, 423, 8561, 254, 450, 520
- Plot the behavioral graph for  $\log n$ ,  $n$ ,  $n \log n$ ,  $n^2$  for different values of  $n = 0, 1, 2, 3, 4, 5$ .

**Q.3 Attempt any one**

**08**

- Devise an algorithm that inputs three integers and outputs them in increasing order. Find time and space complexity of the algorithm.
- Find step count and time complexity of the following algorithms  
 Algorithm Mult (a, b, c, n)  

```

{
  for i:= 1 to n do
    for j= 1 to n do
      {
        c[i,j] := 0;
        for k= 1 to n do
          c[i,j] := c[i,j] + a[i,j] * b[i,j]
      }
    }
  }

```
  - Algorithm sum(A[],n)  

```

{
  sum = 0;
  for i = 1 to n step 2
    sum = sum + A[i];
  return sum;
}

```

- Q.4** For the messages with relative frequencies (1,1, 2, 2, 4, 4, 4, 4), obtain Huffman codes and calculate decode time.

**08**

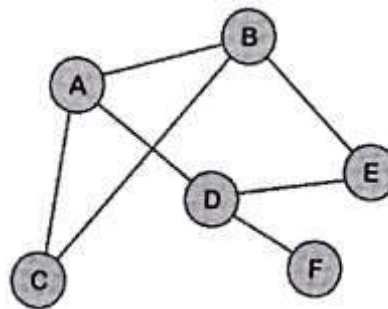
## Section – II

**Q.5 Attempt any three.****12**

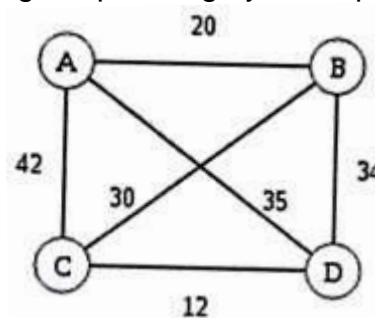
- Find possible binary trees for the identifier set  $(a_1, a_2, a_3) = (\text{cout}, \text{for}, \text{if})$ .
- Explain explicit and implicit constraints w.r.t. n-queens problem and Hamilton Cycle.
- Find maximum profit for  $n = 3$ ,  $(w_1, w_2, w_3) = (10, 3, 5)$  and  $(p_1, p_2, p_3) = (40, 20, 30)$  using dynamic programming.
- Explain P, NP, NP-hard and NP-complete problems.

**Q.6 Attempt any one****08**

- State graph coloring problem and write an algorithm for graph coloring. Find how many colors are required to color the following graph.



- let  $w = \{8, 9, 14, 15, 16, 22, 26, 32\}$  and  $m = 53$ . Find all possible subsets of  $w$  that sum to  $m$  using backtracking. Draw portion of tree that is generated.

**Q.7 Find optimal tour in following Graph using dynamic programming.****08**

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY**  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

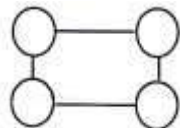
Duration: 30 Minutes

Marks: 14

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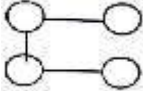
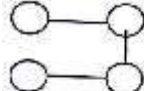
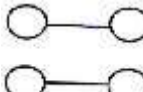

**14**

- 1) Best case complexity for successful search in Binary search is
  - a)  $\theta(1)$
  - b)  $\theta(n \log m)$
  - c)  $\theta(n)$
  - d)  $O(\log n)$
- 2) for  $i = 1$  to  $n-2$   
 $a = a + 1;$   
 How many times for statement will execute?
  - a)  $n-1$
  - b)  $n-2$
  - c)  $n$
  - d)  $n+1$
- 3) In what manner is a state-space tree for a backtracking algorithm constructed?
  - a) Depth-first search
  - b) Breadth-first search
  - c) Twice around the tree
  - d) Nearest neighbour first
- 4) If there are three programs to be stored on tape then how many orderings are possible?
  - a) 1
  - b) 3
  - c) 6
  - d) cannot predict
- 5) What will be the chromatic number for colouring following graph?



- a) 1
  - b) 2
  - c) 3
  - d) 4
- 6) A node which has been generated and all of whose children have not yet been generated is called \_\_\_\_\_.
  - a) Live node
  - b) E-node
  - c) Dead node
  - d) None of these



- 7) Let X be a problem that belongs to the class NP. Then which one of the following is TRUE?
- There is no polynomial time algorithm for X
  - If X can be solved deterministically in polynomial time, then  $P = NP$
  - If X is NP-hard, then it is NP-complete
  - X may be undecidable
- 8) Asymptotic behaviour of the given function  $f(n) = 4n^2 + 97n + 1000$  is \_\_\_\_.
- $O(2^n)$
  - $O(n \log n)$
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  - $O(n) < O(\log n) < o(n \log n) < O(2^n) < O(n^2)$
  - $O(\log n) < O(n) < o(n \log n) < O(n^2) < O(2^n)$
- 13) Which of the following is not spanning tree for a graph with 4 vertices?
- 
  - 
  - 
  - 
- 14) Recurrence relation of Min Max algorithm using divide & conquer method is \_\_\_\_.
- $T(n/2) + 2$
  - $T(n/2) + 4$
  - $2T(n/2) + 2$
  - $2T(n/2) + 4$

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY**  
**Design and Analysis of Algorithms**

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Max. Marks: 56

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**Section – I**

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 100, 200, 50, 90, 150, 50, 20, 80
- b) Show that following equality is incorrect  
 $10n^2 + 9 = O(n)$
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 310, 285, 179, 652, 351, 423, 8561, 254, 450, 520
- d) Plot the behavioral graph for  $\log n$ ,  $n$ ,  $n \log n$ ,  $n^2$  for different values of  $n = 0, 1, 2, 3, 4, 5$ .

**Q.3 Attempt any one** **08**

- a) Devise an algorithm that inputs three integers and outputs them in increasing order. Find time and space complexity of the algorithm.
- b) i) Find step count and time complexity of the following algorithms  
 Algorithm Mult (a, b, c, n)  

```

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  for i:= 1 to n do
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        c[i,j] := 0;
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      }
    }
  }

```
- ii) Algorithm sum(A[],n)  

```

{
  sum = 0;
  for i = 1 to n step 2
    sum = sum + A[i];
  return sum;
}

```

**Q.4** For the messages with relative frequencies (1,1, 2, 2, 4, 4, 4, 4), obtain Huffman codes and calculate decode time. **08**

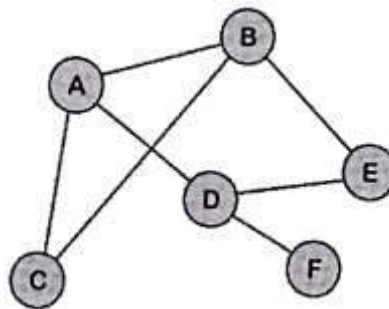
## Section – II

**Q.5 Attempt any three.****12**

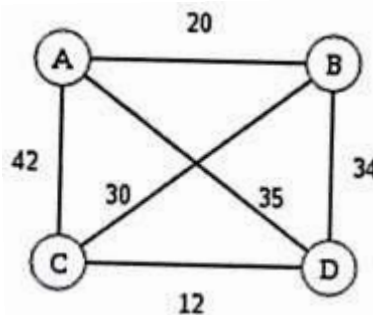
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**Q.7 Find optimal tour in following Graph using dynamic programming.****08**

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**MCQ/Objective Type Questions**

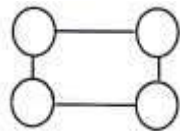
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If there are three programs to be stored on tape then how many orderings are possible?
  - a) 1
  - b) 3
  - c) 6
  - d) cannot predict
- 2) What will be the chromatic number for colouring following graph?



- a) 1
  - b) 2
  - c) 3
  - d) 4
- 3) A node which has been generated and all of whose children have not yet been generated is called \_\_\_\_\_.
    - a) Live node
    - b) E-node
    - c) Dead node
    - d) None of these
  - 4) Let X be a problem that belongs to the class NP. Then which one of the following is TRUE?
    - a) There is no polynomial time algorithm for X
    - b) If X can be solved deterministically in polynomial time, then  $P = NP$
    - c) If X is NP-hard, then it is NP-complete
    - d) X may be undecidable
  - 5) Asymptotic behaviour of the given function  $f(n) = 4n^2 + 97n + 1000$  is \_\_\_\_\_.
    - a)  $O(2^n)$
    - b)  $O(n \log m)$
    - c)  $O(n)$
    - d)  $O(n^2)$
  - 6) Two main measures for the efficiency of an algorithm are \_\_\_\_\_.
    - a) Processor and memory
    - b) Complexity and capacity
    - c) Time and space
    - d) Data and space

- Page 10 of 16

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| Set | R |
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY**  
**Design and Analysis of Algorithms**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) Sort the following array using merge sort.  
 100, 200, 50, 90, 150, 50, 20, 80
- b) Show that following equality is incorrect  
 $10n^2 + 9 = O(n)$
- c) Find 3<sup>rd</sup> smallest element from the array using divide and conquer.  
 310, 285, 179, 652, 351, 423, 8561, 254, 450, 520
- d) Plot the behavioral graph for  $\log n$ ,  $n$ ,  $n \log n$ ,  $n^2$  for different values of  $n = 0, 1, 2, 3, 4, 5$ .

**Q.3 Attempt any one** **08**

- a) Devise an algorithm that inputs three integers and outputs them in increasing order. Find time and space complexity of the algorithm.
- b) i) Find step count and time complexity of the following algorithms  
 Algorithm Mult (a, b, c, n)  

```

{
  for i:= 1 to n do
    for j= 1 to n do
      {
        c[i,j] := 0;
        for k= 1 to n do
          c[i,j] := c[i,j] + a[i,j] * b[i,j]
      }
    }
  }

```
- ii) Algorithm sum(A[],n)  

```

{
  sum = 0;
  for i = 1 to n step 2
    sum = sum + A[i];
  return sum;
}

```

**Q.4** For the messages with relative frequencies (1,1, 2, 2, 4, 4, 4, 4), obtain Huffman codes and calculate decode time. **08**

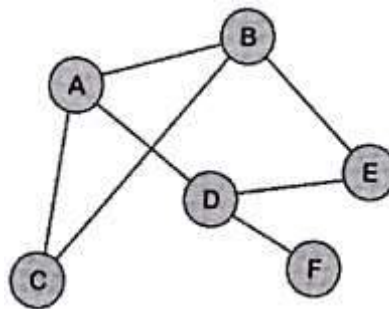
## Section – II

**Q.5 Attempt any three.****12**

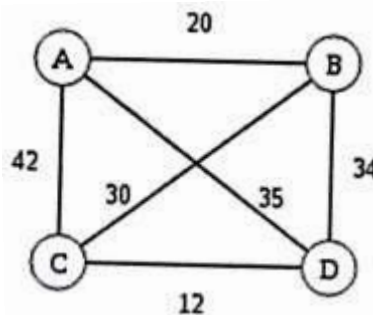
- Find possible binary trees for the identifier set  $(a_1, a_2, a_3) = (\text{cout}, \text{for}, \text{if})$ .
- Explain explicit and implicit constraints w.r.t. n-queens problem and Hamilton Cycle.
- Find maximum profit for  $n = 3$ ,  $(w_1, w_2, w_3) = (10, 3, 5)$  and  $(p_1, p_2, p_3) = (40, 20, 30)$  using dynamic programming.
- Explain P, NP, NP-hard and NP-complete problems.

**Q.6 Attempt any one****08**

- State graph coloring problem and write an algorithm for graph coloring. Find how many colors are required to color the following graph.



- let  $w = \{8, 9, 14, 15, 16, 22, 26, 32\}$  and  $m = 53$ . Find all possible subsets of  $w$  that sum to  $m$  using backtracking. Draw portion of tree that is generated.

**Q.7 Find optimal tour in following Graph using dynamic programming.****08**

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| Seat No. |  |
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Set **S**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY**  
**Design and Analysis of Algorithms**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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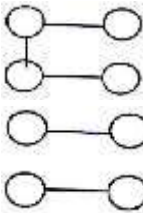
**MCQ/Objective Type Questions**

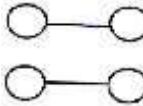
Duration: 30 Minutes

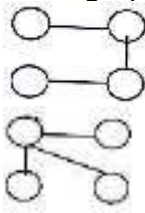
Marks: 14

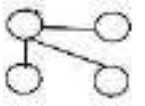
**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not spanning tree for a graph with 4 vertices?
- a) 

c) 

b) 

d) 
- 2) Recurrence relation of Min Max algorithm using divide & conquer method is \_\_\_\_.
- a)  $T(n/2)+2$

b)  $T(n/2)+4$

c)  $2T(n/2)+2$

d)  $2T(n/2)+4$
- 3) Best case complexity for successful search in Binary search is
- a)  $\theta(1)$

b)  $\theta(n \log n)$

c)  $\theta(n)$

d)  $O(\log n)$
- 4) for  $i = 1$  to  $n-2$   
      $a=a+1$ ;  
 How many times for statement will execute?
- a)  $n-1$

b)  $n-2$

c)  $n$

d)  $n+1$
- 5) In what manner is a state-space tree for a backtracking algorithm constructed?
- a) Depth-first search

b) Breadth-first search

c) Twice around the tree

d) Nearest neighbour first
- 6) If there are three programs to be stored on tape then how many orderings are possible?
- a) 1

b) 3

c) 6

d) cannot predict



A diagram of a square graph with four vertices and four edges. The vertices are arranged in a square, with two vertices on the left and two on the right. The edges connect the top-left vertex to the top-right vertex, the bottom-left vertex to the bottom-right vertex, the top-left vertex to the bottom-left vertex, and the top-right vertex to the bottom-right vertex.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY**  
**Design and Analysis of Algorithms**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any three.** **12**

- a) Sort the following array using merge sort.  
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- b) Show that following equality is incorrect  
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- c) Find 3<sup>rd</sup> smallest element from the array using divide and conquer.  
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- d) Plot the behavioral graph for  $\log n$ ,  $n$ ,  $n \log n$ ,  $n^2$  for different values of  $n = 0, 1, 2, 3, 4, 5$ .

**Q.3 Attempt any one** **08**

- a) Devise an algorithm that inputs three integers and outputs them in increasing order. Find time and space complexity of the algorithm.
- b) i) Find step count and time complexity of the following algorithms  
 Algorithm Mult (a, b, c, n)  

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    for j= 1 to n do
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      }
    }
  }

```
- ii) Algorithm sum(A[],n)  

```

{
  sum = 0;
  for i = 1 to n step 2
    sum = sum + A[i];
  return sum;
}

```

**Q.4** For the messages with relative frequencies (1,1, 2, 2, 4, 4, 4, 4), obtain Huffman codes and calculate decode time. **08**

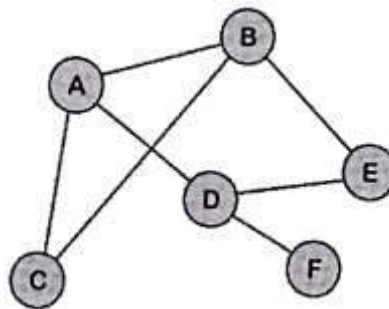
## Section – II

**Q.5 Attempt any three.****12**

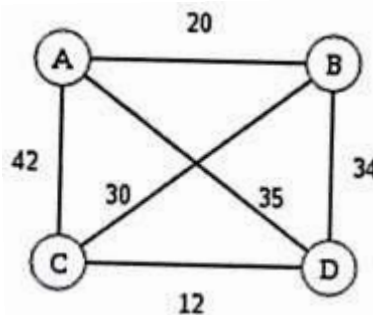
- Find possible binary trees for the identifier set  $(a_1, a_2, a_3) = (\text{cout}, \text{for}, \text{if})$ .
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- Find maximum profit for  $n = 3$ ,  $(w_1, w_2, w_3) = (10, 3, 5)$  and  $(p_1, p_2, p_3) = (40, 20, 30)$  using dynamic programming.
- Explain P, NP, NP-hard and NP-complete problems.

**Q.6 Attempt any one****08**

- State graph coloring problem and write an algorithm for graph coloring. Find how many colors are required to color the following graph.



- let  $w = \{8, 9, 14, 15, 16, 22, 26, 32\}$  and  $m = 53$ . Find all possible subsets of  $w$  that sum to  $m$  using backtracking. Draw portion of tree that is generated.

**Q.7 Find optimal tour in following Graph using dynamic programming.****08**

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P

**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Reinforcement learning is \_\_\_\_\_.  
 a) Unsupervised learning                      b) Supervised learning  
 c) Award based learning                      d) None of the above
- 2) Which of the following is an application of reinforcement learning?  
 a) Topic modeling                                  b) Recommendation system  
 c) Pattern recognition                              d) Image classification
- 3) Upper confidence bound is a \_\_\_\_\_.  
 a) Reinforcement algorithm                      b) Supervised algorithm  
 c) Unsupervised algorithm                      d) None of the above
- 4) Which of the following is true about reinforcement learning?  
 a) The agent gets rewards or penalty according to the action  
 b) It's an online learning  
 c) The target of an agent is to maximize the rewards  
 d) All of the above
- 5) You have a task which is to show relative ads to target users. Which algorithm you should use for this task?  
 a) K means clustering                              b) Naive Bayes  
 c) Support vector machine                      d) Upper confidence bound
- 6) Hidden Markov Model is used in- \_\_\_\_\_.  
 a) Supervised learning                              b) Unsupervised learning  
 c) Reinforcement learning                      d) All of the above
- 7) Reinforcement learning is a \_\_\_\_\_ directed computational approach where a computer learns to perform a task by interacting with an uncertain dynamic environment.  
 a) State                                                  b) Goal  
 c) Space                                                  d) Map

- 8) In Bandit problem we Pull arms sequentially so as to \_\_\_\_\_ the total expected reward.
- |                |             |
|----------------|-------------|
| a) minimize    | b) maximize |
| c) average out | d) select   |
- 9) MAB deal with '\_\_\_\_\_' of the core ideas in RL.
- |                                 |                  |
|---------------------------------|------------------|
| a) exploitation                 | b) exploration   |
| c) exploration and exploitation | d) None of these |
- 10) armed Testbed has 10 \_\_\_\_\_ distributions.
- |                        |                  |
|------------------------|------------------|
| a) Actions             | b) rewards       |
| c) actions and rewards | d) None of these |
- 11) Softmax idea: grade action probs. By \_\_\_\_\_ values.
- |              |            |
|--------------|------------|
| a) Estimated | b) Assumed |
| c) average   | d) bound   |
- 12) Subsequence of interaction between agent environment.
- |              |          |
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| a) Episodes: | b) Terms |
| c) States    | d) Steps |
- 13) Greediest action – action with the \_\_\_\_\_ estimated reward.
- |            |                   |
|------------|-------------------|
| a) Lowest  | b) Highest        |
| c) Average | d) Not applicable |
- 14) Softmax idea: grade action probs. by \_\_\_\_\_ values.
- |            |              |
|------------|--------------|
| a) Lowest  | b) Estimated |
| c) Highest | d) Average   |

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any THREE.** **12**
- a) What are the different kinds of Learning? Show how Reinforcement Learning is different.
  - b) What is Temporal Difference Learning?
  - c) What are the basic exploration strategies w.r.t Reinforcement Learning?
  - d) Explain the use of action- value methods with examples.
- Q.3 Attempt any ONE.** **08**
- a) With a neat diagram explain the basic elements of a Reinforcement Learning System.
  - b) Discuss the 10 armed bandit test-bed with associated results.
- Q.4** How can the k-Armed bandit problem be solved by Markov Decision Process? **08**

**Section – II**

- Q.5 Attempt any THREE..** **12**
- a) How is Dynamic Programming used to solve problems?
  - b) Compare between Direct and Indirect Reinforcement Learning.
  - c) Develop a solution to Maze problem using Dyna-Q.
  - d) What is Thermal soaring? Illustrate how Reinforcement Learning can be used to solve this problem.
- Q.6 Attempt any ONE.** **08**
- a) How is iterative policy evaluated in Dynamic Programming?
  - b) With examples Illustrate the efficiency of Dynamic Programming.
- Q.7** Illustrate the working of Sarsa and explain its functionality using a pseudo code. **08**

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In Bandit problem we Pull arms sequentially so as to \_\_\_\_\_ the total expected reward.
 

|                |             |
|----------------|-------------|
| a) minimize    | b) maximize |
| c) average out | d) select   |
- 2) MAB deal with '\_\_\_\_\_' of the core ideas in RL.
 

|                                 |                  |
|---------------------------------|------------------|
| a) exploitation                 | b) exploration   |
| c) exploration and exploitation | d) None of these |
- 3) armed Testbed has 10 \_\_\_\_\_ distributions.
 

|                        |                  |
|------------------------|------------------|
| a) Actions             | b) rewards       |
| c) actions and rewards | d) None of these |
- 4) Softmax idea: grade action probs. By \_\_\_\_\_ values.
 

|              |            |
|--------------|------------|
| a) Estimated | b) Assumed |
| c) average   | d) bound   |
- 5) Subsequence of interaction between agent environment.
 

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| a) Episodes: | b) Terms |
| c) States    | d) Steps |
- 6) Greediest action – action with the \_\_\_\_\_ estimated reward.
 

|            |                   |
|------------|-------------------|
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|            |              |
|------------|--------------|
| a) Lowest  | b) Estimated |
| c) Highest | d) Average   |
- 8) Reinforcement learning is \_\_\_\_\_.
 

|                          |                        |
|--------------------------|------------------------|
| a) Unsupervised learning | b) Supervised learning |
| c) Award based learning  | d) None of the above   |
- 9) Which of the following is an application of reinforcement learning?
 

|                        |                          |
|------------------------|--------------------------|
| a) Topic modeling      | b) Recommendation system |
| c) Pattern recognition | d) Image classification  |

- 10) Upper confidence bound is a \_\_\_\_\_.  
a) Reinforcement algorithm      b) Supervised algorithm  
c) Unsupervised algorithm      d) None of the above
- 11) Which of the following is true about reinforcement learning?  
a) The agent gets rewards or penalty according to the action  
b) It's an online learning  
c) The target of an agent is to maximize the rewards  
d) All of the above
- 12) You have a task which is to show relative ads to target users. Which algorithm you should use for this task?  
a) K means clustering      b) Naive Bayes  
c) Support vector machine      d) Upper confidence bound
- 13) Hidden Markov Model is used in- \_\_\_\_\_.  
a) Supervised learning      b) Unsupervised learning  
c) Reinforcement learning      d) All of the above
- 14) Reinforcement learning is a \_\_\_\_\_ directed computational approach where a computer learns to perform a task by interacting with an uncertain dynamic environment.  
a) State      b) Goal  
c) Space      d) Map



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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any THREE.** **12**
- What are the different kinds of Learning? Show how Reinforcement Learning is different.
  - What is Temporal Difference Learning?
  - What are the basic exploration strategies w.r.t Reinforcement Learning?
  - Explain the use of action- value methods with examples.
- Q.3 Attempt any ONE.** **08**
- With a neat diagram explain the basic elements of a Reinforcement Learning System.
  - Discuss the 10 armed bandit test-bed with associated results.
- Q.4** How can the k-Armed bandit problem be solved by Markov Decision Process? **08**

**Section – II**

- Q.5 Attempt any THREE..** **12**
- How is Dynamic Programming used to solve problems?
  - Compare between Direct and Indirect Reinforcement Learning.
  - Develop a solution to Maze problem using Dyna-Q.
  - What is Thermal soaring? Illustrate how Reinforcement Learning can be used to solve this problem.
- Q.6 Attempt any ONE.** **08**
- How is iterative policy evaluated in Dynamic Programming?
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- Q.7** Illustrate the working of Sarsa and explain its functionality using a pseudo code. **08**

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Softmax idea: grade action probs. By \_\_\_\_\_ values.
  - a) Estimated
  - b) Assumed
  - c) average
  - d) bound
- 2) Subsequence of interaction between agent environment.
  - a) Episodes:
  - b) Terms
  - c) States
  - d) Steps
- 3) Greediest action – action with the \_\_\_\_\_ estimated reward.
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- 4) Softmax idea: grade action probs. by \_\_\_\_\_ values.
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- 5) Reinforcement learning is \_\_\_\_\_.
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- 6) Which of the following is an application of reinforcement learning?
  - a) Topic modeling
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  - c) exploration and exploitation
  - d) None of these
- 14) armed Testbed has 10 \_\_\_\_\_ distributions.
- a) Actions
  - b) rewards
  - c) actions and rewards
  - d) None of these

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any THREE.** **12**
- What are the different kinds of Learning? Show how Reinforcement Learning is different.
  - What is Temporal Difference Learning?
  - What are the basic exploration strategies w.r.t Reinforcement Learning?
  - Explain the use of action- value methods with examples.
- Q.3 Attempt any ONE.** **08**
- With a neat diagram explain the basic elements of a Reinforcement Learning System.
  - Discuss the 10 armed bandit test-bed with associated results.
- Q.4** How can the k-Armed bandit problem be solved by Markov Decision Process? **08**

**Section – II**

- Q.5 Attempt any THREE..** **12**
- How is Dynamic Programming used to solve problems?
  - Compare between Direct and Indirect Reinforcement Learning.
  - Develop a solution to Maze problem using Dyna-Q.
  - What is Thermal soaring? Illustrate how Reinforcement Learning can be used to solve this problem.
- Q.6 Attempt any ONE.** **08**
- How is iterative policy evaluated in Dynamic Programming?
  - With examples Illustrate the efficiency of Dynamic Programming.
- Q.7** Illustrate the working of Sarsa and explain its functionality using a pseudo code. **08**

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Hidden Markov Model is used in- \_\_\_\_\_.  
 a) Supervised learning                      b) Unsupervised learning  
 c) Reinforcement learning                  d) All of the above
- 2) Reinforcement learning is a \_\_\_\_\_ directed computational approach where a computer learns to perform a task by interacting with an uncertain dynamic environment.  
 a) State                                              b) Goal  
 c) Space                                              d) Map
- 3) In Bandit problem we Pull arms sequentially so as to \_\_\_\_\_ the total expected reward.  
 a) minimize                                      b) maximize  
 c) average out                                      d) select
- 4) MAB deal with '\_\_\_\_\_' of the core ideas in RL.  
 a) exploitation                                      b) exploration  
 c) exploration and exploitation              d) None of these
- 5) armed Testbed has 10 \_\_\_\_\_ distributions.  
 a) Actions                                              b) rewards  
 c) actions and rewards                          d) None of these
- 6) Softmax idea: grade action probs. By \_\_\_\_\_ values.  
 a) Estimated                                      b) Assumed  
 c) average                                              d) bound
- 7) Subsequence of interaction between agent environment.  
 a) Episodes:                                      b) Terms  
 c) States                                              d) Steps
- 8) Greediest action – action with the \_\_\_\_\_ estimated reward.  
 a) Lowest                                              b) Highest  
 c) Average                                              d) Not applicable

- Page 11 of 12

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Reinforcement Learning**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any THREE.** **12**
- What are the different kinds of Learning? Show how Reinforcement Learning is different.
  - What is Temporal Difference Learning?
  - What are the basic exploration strategies w.r.t Reinforcement Learning?
  - Explain the use of action- value methods with examples.
- Q.3 Attempt any ONE.** **08**
- With a neat diagram explain the basic elements of a Reinforcement Learning System.
  - Discuss the 10 armed bandit test-bed with associated results.
- Q.4** How can the k-Armed bandit problem be solved by Markov Decision Process? **08**

**Section – II**

- Q.5 Attempt any THREE..** **12**
- How is Dynamic Programming used to solve problems?
  - Compare between Direct and Indirect Reinforcement Learning.
  - Develop a solution to Maze problem using Dyna-Q.
  - What is Thermal soaring? Illustrate how Reinforcement Learning can be used to solve this problem.
- Q.6 Attempt any ONE.** **08**
- How is iterative policy evaluated in Dynamic Programming?
  - With examples Illustrate the efficiency of Dynamic Programming.
- Q.7** Illustrate the working of Sarsa and explain its functionality using a pseudo code. **08**

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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 14

## 14

- Which of the measures given here are based on every item of the series (uses all Observations)?
  - Range
  - Standard Deviation
  - Quartile Deviation
  - All of the above
- Find the median of the following data:  
160, 180, 200, 280, 300, 320, 400
  - 140
  - 300
  - 180
  - 280
- A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Which of the following statement is true in following case?
  - Feature F1 is an example of nominal variable.
  - Feature F1 is an example of ordinal variable.
  - It doesn't belong to any of the above category
  - Both of these
- What are the benefits of Data Visualizations?
  - Better Analysis
  - Identifying patterns
  - Exploring Business Insights
  - All of the above
- "The sum of squares of deviations of the values is least" when deviations are taken from \_\_\_\_\_.
  - Median
  - Mode
  - Arithmetic Mean
  - Geometric Mean
- In a week the prices of a bag of rice were 350, 280, 340, 290, 320, 310, 300. The range is \_\_\_\_\_.
  - 60
  - 90
  - 70
  - 100



- 7) Taking mean centring for a given variable is achieved by:
- Taking the mean of all scores (ignoring from which variable they come) and subtracting each score from it.
  - Taking each score and subtracting from it the mean of all scores (for that variable).
  - Taking each score and dividing it by the mean of all scores (for that variable).
  - Taking each score, subtracting the mean and then dividing by the standard deviation.
- 8) The combined effect of two variables on another is known conceptually as \_\_\_\_\_, and in statistical terms as \_\_\_\_\_.
- Mediation, an interaction effect
  - Moderation, a direct effect
  - Moderation, an interaction effect
  - Mediation, a direct effect
- 9) Which of the following quantities does not affect the width of the confidence interval for a population proportion?
- Sample Proportion
  - Population Size
  - Sample size
  - Confidence level
- 10) Which of the following is true about hypothesis testing?
- Hypothesis are statements about the population(s)
  - Results are said to be statistically significant when the p-value is greater than the alpha level.
  - The test statistic is a population parameter
  - None of the above
- 11) What will be printed?
- ```
import numpy as np
a = np.array([1,2,3,5,8])
b = np.array([0,3,4,2,1])
c = a + b
c = c*a
print (c[2])
```
- 7
  - 12
  - 10
  - 21
- 12) A Tabular arrangement for classifying data into different groups is called \_\_\_\_.
- Standard deviation
  - frequency distribution
  - Secondary data
  - Arithmetic Mean
- 13) Which of the following ways to create a MultiIndex (multi-level index)?
- From a list of arrays using MultiIndex.from\_arrays()
  - From an array of tuples using MultiIndex.from\_tuples()
  - From a crossed set of iterables using MultiIndex.from\_product()
  - All of the above
- 14) Amongst which of the following is a correct syntax for panda's dataframe?
- Pandas.DataFrame(data, index, dtype, copy)
  - pandas.DataFrame( data, index, columns, dtype, copy)
  - pandas.DataFrame(data, index, dtype, copy)
  - pandas.DataFrame( data, index, rows, dtype, copy)

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**INFORMATION TECHNOLOGY**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- a) Write a program to create an empty array of 3X4 and full array of 3X3 of INTEGER type?
  - b) What type of plot would you use if you need to demonstrate “relationship” between variables/parameters?
  - c) What is nominal variable and ordinal variable? Explain with examples.
  - d) What are ways of creating 1D, 2D and 3D arrays in NumPy?
  - e) How do you convert Pandas DataFrame to a NumPy array?
- Q.3 a) Define a Range? What are the Applications of Range? Explain the method of How to Find Range with example?** **06**
- b) Find the standard deviation of the average temperatures recorded over a five-day period last winter:** **06**
- 18,22,19,25,12

**Section – II**

- Q.4 Attempt Any FOUR:** **16**
- a) What is Data visualization? What are the advantages of Data Visualization?
  - b) Draw a diagram of Box plot representing multi-variate categorical variables.
  - c) Define a scatter plot? Write syntax of scatter plot and explain its parameter in the syntax.
  - d) Name any 4 libraries in Python used for Data Analysis and Scientific computations?
  - e) How can we visualize more than three dimensions of data in a single chart?
- Q.5 Attempt Any ONE:** **12**
- a) Describe in detail Three-Dimensional Plotting in Matplotlib.
  - b) What is a dynamic technique in data visualization? explain with Example.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**INFORMATION TECHNOLOGY**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The combined effect of two variables on another is known conceptually as \_\_\_\_\_, and in statistical terms as \_\_\_\_\_.  
 a) Mediation, an interaction effect  
 b) Moderation, a direct effect  
 c) Moderation, an interaction effect  
 d) Mediation, a direct effect
- 2) Which of the following quantities does not affect the width of the confidence interval for a population proportion?  
 a) Sample Proportion                      b) Population Size  
 c) Sample size                                d) Confidence level
- 3) Which of the following is true about hypothesis testing?  
 a) Hypothesis are statements about the population(s)  
 b) Results are said to be statistically significant when the p-value is greater than the alpha level.  
 c) The test statistic is a population parameter  
 d) None of the above
- 4) What will be printed?  
 import numpy as np  
 a = np.array([1,2,3,5,8])  
 b = np.array([0,3,4,2,1])  
 c = a + b  
 c = c\*a  
 print (c[2])  
 a) 7    b) 12  
 c) 10     d) 21
- 5) A Tabular arrangement for classifying data into different groups is called \_\_\_\_.  
 a) Standard deviation                      b) frequency distribution  
 c) Secondary data                            d) Arithmetic Mean

- 6) Which of the following ways to create a MultiIndex (multi-level index)?
- a) From a list of arrays using MultiIndex.from\_arrays()
  - b) From an array of tuples using MultiIndex.from\_tuples()
  - c) From a crossed set of iterables using MultiIndex.from\_product()
  - d) All of the above
- 7) Amongst which of the following is a correct syntax for panda's dataframe?
- a) Pandas.DataFrame(data, index, dtype, copy)
  - b) pandas.DataFrame( data, index, columns, dtype, copy)
  - c) pandas.DataFrame(data, index, dtype, copy)
  - d) pandas.DataFrame( data, index, rows, dtype, copy)
- 8) Which of the measures given here are based on every item of the series (uses all Observations)?
- a) Range
  - b) Standard Deviation
  - c) Quartile Deviation
  - d) All of the above
- 9) Find the median of the following data:  
160, 180, 200, 280, 300, 320, 400
- a) 140
  - b) 300
  - c) 180
  - d) 280
- 10) A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Which of the following statement is true in following case?
- a) Feature F1 is an example of nominal variable.
  - b) Feature F1 is an example of ordinal variable.
  - c) It doesn't belong to any of the above category
  - d) Both of these
- 11) What are the benefits of Data Visualizations?
- a) Better Analysis
  - b) Identifying patterns
  - c) Exploring Business Insights
  - d) All of the above
- 12) "The sum of squares of deviations of the values is least" when deviations are taken from \_\_\_\_\_.
- a) Median
  - b) Mode
  - c) Arithmetic Mean
  - d) Geometric Mean
- 13) In a week the prices of a bag of rice were 350, 280, 340, 290, 320, 310, 300. The range is \_\_\_\_\_.
- a) 60
  - b) 90
  - c) 70
  - d) 100
- 14) Taking mean centring for a given variable is achieved by:
- a) Taking the mean of all scores (ignoring from which variable they come) and subtracting each score from it.
  - b) Taking each score and subtracting from it the mean of all scores (for that variable).
  - c) Taking each score and dividing it by the mean of all scores (for that variable).
  - d) Taking each score, subtracting the mean and then dividing by the standard deviation.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**INFORMATION TECHNOLOGY**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- Write a program to create an empty array of 3X4 and full array of 3X3 of INTEGER type?
  - What type of plot would you use if you need to demonstrate “relationship” between variables/parameters?
  - What is nominal variable and ordinal variable? Explain with examples.
  - What are ways of creating 1D, 2D and 3D arrays in NumPy?
  - How do you convert Pandas DataFrame to a NumPy array?
- Q.3 a)** Define a Range? What are the Applications of Range? Explain the method of How to Find Range with example? **06**
- b)** Find the standard deviation of the average temperatures recorded over a five-day period last winter: **06**  
 18,22,19,25,12

**Section – II**

- Q.4 Attempt Any FOUR:** **16**
- What is Data visualization? What are the advantages of Data Visualization?
  - Draw a diagram of Box plot representing multi-variate categorical variables.
  - Define a scatter plot? Write syntax of scatter plot and explain its parameter in the syntax.
  - Name any 4 libraries in Python used for Data Analysis and Scientific computations?
  - How can we visualize more than three dimensions of data in a single chart?
- Q.5 Attempt Any ONE:** **12**
- Describe in detail Three-Dimensional Plotting in Matplotlib.
  - What is a dynamic technique in data visualization? explain with Example.

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**INFORMATION TECHNOLOGY**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What will be printed?  

```
import numpy as np

a = np.array([1,2,3,5,8])
b = np.array([0,3,4,2,1])
c = a + b
c = c*a
print (c[2])
```

  - a) 7
  - b) 12
  - c) 10
  - d) 21
- 2) A Tabular arrangement for classifying data into different groups is called \_\_\_\_\_.  
  - a) Standard deviation
  - b) frequency distribution
  - c) Secondary data
  - d) Arithmetic Mean
- 3) Which of the following ways to create a MultiIndex (multi-level index)?  
  - a) From a list of arrays using MultiIndex.from\_arrays()
  - b) From an array of tuples using MultiIndex.from\_tuples()
  - c) From a crossed set of iterables using MultiIndex.from\_product()
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- 4) Amongst which of the following is a correct syntax for panda's dataframe?  
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  - b) pandas.DataFrame( data, index, columns, dtype, copy)
  - c) pandas.DataFrame(data, index, dtype, copy)
  - d) pandas.DataFrame( data, index, rows, dtype, copy)
- 5) Which of the measures given here are based on every item of the series (uses all Observations)?  
  - a) Range
  - b) Standard Deviation
  - c) Quartile Deviation
  - d) All of the above
- 6) Find the median of the following data:  
 160,180, 200, 280, 300, 320, 400  
  - a) 140
  - b) 300
  - c) 180
  - d) 280

- 7) A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Which of the following statement is true in following case?
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  - b) Feature F1 is an example of ordinal variable.
  - c) It doesn't belong to any of the above category
  - d) Both of these
- 8) What are the benefits of Data Visualizations?
- a) Better Analysis
  - b) Identifying patterns
  - c) Exploring Business Insights
  - d) All of the above
- 9) "The sum of squares of deviations of the values is least" when deviations are taken from \_\_\_\_\_.
- a) Median
  - b) Mode
  - c) Arithmetic Mean
  - d) Geometric Mean
- 10) In a week the prices of a bag of rice were 350, 280, 340, 290, 320, 310, 300. The range is \_\_\_\_\_.
- a) 60
  - b) 90
  - c) 70
  - d) 100
- 11) Taking mean centring for a given variable is achieved by:
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  - b) Taking each score and subtracting from it the mean of all scores (for that variable).
  - c) Taking each score and dividing it by the mean of all scores (for that variable).
  - d) Taking each score, subtracting the mean and then dividing by the standard deviation.
- 12) The combined effect of two variables on another is known conceptually as \_\_\_\_\_, and in statistical terms as \_\_\_\_\_.
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  - c) Moderation, an interaction effect
  - d) Mediation, a direct effect
- 13) Which of the following quantities does not affect the width of the confidence interval for a population proportion?
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  - c) Sample size
  - d) Confidence level
- 14) Which of the following is true about hypothesis testing?
- a) Hypothesis are statements about the population(s)
  - b) Results are said to be statistically significant when the p-value is greater than the alpha level.
  - c) The test statistic is a population parameter
  - d) None of the above

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**INFORMATION TECHNOLOGY**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- Write a program to create an empty array of 3X4 and full array of 3X3 of INTEGER type?
  - What type of plot would you use if you need to demonstrate “relationship” between variables/parameters?
  - What is nominal variable and ordinal variable? Explain with examples.
  - What are ways of creating 1D, 2D and 3D arrays in NumPy?
  - How do you convert Pandas DataFrame to a NumPy array?
- Q.3 a)** Define a Range? What are the Applications of Range? Explain the method of How to Find Range with example? **06**
- b)** Find the standard deviation of the average temperatures recorded over a five-day period last winter: **06**  
 18,22,19,25,12

**Section – II**

- Q.4 Attempt Any FOUR:** **16**
- What is Data visualization? What are the advantages of Data Visualization?
  - Draw a diagram of Box plot representing multi-variate categorical variables.
  - Define a scatter plot? Write syntax of scatter plot and explain its parameter in the syntax.
  - Name any 4 libraries in Python used for Data Analysis and Scientific computations?
  - How can we visualize more than three dimensions of data in a single chart?
- Q.5 Attempt Any ONE:** **12**
- Describe in detail Three-Dimensional Plotting in Matplotlib.
  - What is a dynamic technique in data visualization? explain with Example.



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Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 14

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**Set S**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov – 2022**  
**INFORMATION TECHNOLOGY**  
**Data Preprocessing & Visualization**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt Any FOUR:** **16**
- Write a program to create an empty array of 3X4 and full array of 3X3 of INTEGER type?
  - What type of plot would you use if you need to demonstrate “relationship” between variables/parameters?
  - What is nominal variable and ordinal variable? Explain with examples.
  - What are ways of creating 1D, 2D and 3D arrays in NumPy?
  - How do you convert Pandas DataFrame to a NumPy array?
- Q.3 a)** Define a Range? What are the Applications of Range? Explain the method of How to Find Range with example? **06**
- b)** Find the standard deviation of the average temperatures recorded over a five-day period last winter: **06**  
 18,22,19,25,12

**Section – II**

- Q.4 Attempt Any FOUR:** **16**
- What is Data visualization? What are the advantages of Data Visualization?
  - Draw a diagram of Box plot representing multi-variate categorical variables.
  - Define a scatter plot? Write syntax of scatter plot and explain its parameter in the syntax.
  - Name any 4 libraries in Python used for Data Analysis and Scientific computations?
  - How can we visualize more than three dimensions of data in a single chart?
- Q.5 Attempt Any ONE:** **12**
- Describe in detail Three-Dimensional Plotting in Matplotlib.
  - What is a dynamic technique in data visualization? explain with Example.

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4** Discuss the features of new economic policy in India. **10**
- Q.5** Explain the properties of perfect and imperfectly competitive market. **10**
- Q.6** Define national income. Explain the methods of measuring national income. **10**
- Q.7** Define central bank, discuss the function of central banking in India. **10**

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |           |
|--|-----------|
| <b>Q.2 Write short notes.</b>  | <b>10</b> |
| a) Nature of Economics   |           |
| b) Market Equilibrium  |           |
| <b>Q.3 Write short notes.</b>  | <b>10</b> |
| a) Importance of money in economy  |           |
| b) Consumption and Saving  |           |
| <b>Q.4 Discuss the features of new economic policy in India.</b>                     | <b>10</b> |
| <b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <b>10</b> |
| <b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <b>10</b> |
| <b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <b>10</b> |

Seat No.	
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Set **R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.
- a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 10) Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-303**

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4** Discuss the features of new economic policy in India. **10**
- Q.5** Explain the properties of perfect and imperfectly competitive market. **10**
- Q.6** Define national income. Explain the methods of measuring national income. **10**
- Q.7** Define central bank, discuss the function of central banking in India. **10**

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850



- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- |              |               |
|--------------|---------------|
| a) Copyright | b) Patents    |
| c) Contracts | d) Trademarks |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

<b>Seat No.</b>	
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- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works



<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two)** **20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four)** **20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set R
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 2) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 3) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 4) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 5) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 6) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 7) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 2) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 3) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
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a) Vinoba Bhave	b) Mahatma Phule
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- 6) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
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- 8) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 9) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 10) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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**Set****P**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later      b) Drink alcohol to relax  
c) Break it down into smaller task      d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set	S
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** Write short notes on any four **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

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<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics



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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 2) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 4) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 5) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above
- 6) The objectives of professional ethics in engineering are
  - a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

- 9)** Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture                      b) Value  
c) Society                     d) Moral
- 10)** Virtues are \_\_\_\_\_.  
a) Moral                        b) Ethics  
c) Values                      d) Positive and preferred values

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.  
a) which can be only changed in the long run  
b) which can be changed in the short run  
c) which can be never be changed  
d) All of the above
- 10) Which one of the following is not the function of money?  
a) Medium of exchange  
b) Measure of Happiness  
c) Standard of deferred payment  
d) Store of value

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |  |               |
|--|---------------|
| <b>Q.2 Write short notes.</b>  | <b>10</b>     |
| a) Nature of Economics   |               |
| b) Market Equilibrium  |               |
| <br><b>Q.3 Write short notes.</b>  | <br><b>10</b> |
| a) Importance of money in economy  |               |
| b) Consumption and Saving  |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-313**

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4 Discuss the features of new economic policy in India.** **10**
- Q.5 Explain the properties of perfect and imperfectly competitive market.** **10**
- Q.6 Define national income. Explain the methods of measuring national income.** **10**
- Q.7 Define central bank, discuss the function of central banking in India.** **10**

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850



- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

a) Art	b) Invention
c) Goods	d) Ideas
- 2) What is copyright meant for?
 

a) Film work	b) Books
c) Essay	d) All of these
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

a) Ethical value	b) Moral value
c) Social value	d) Commercial value
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

a) 1856	b) 1880
c) 1905	d) 1850
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

a) Copyright	b) Patents
c) Contracts	d) Trademarks
- 6) Which is not a type of intellectual property?
 

a) Trade secrets	b) Trademarks
c) Home loans	d) Copyrights
- 7) In which article is intellectual property rights outlined?
 

a) Article 15	b) Article 27
c) Article 13	d) Article 20
- 8) How long does intellectual property last? (after the death of the author)
 

a) 10 yrs	b) 30 yrs
c) 60 yrs	d) 70 yrs
- 9) Which of the following can you copyright?
 

a) Literary work	b) Ideas
c) Choreographic work	d) Fashion

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Two)** **20**
- a) Explain the detail the role of WTO in protecting intellectual property rights.
  - b) How the intellectual property is useful for Engineers. Explain in detail with example.
  - c) Compare the Indian IPR system with international IPR framework.
- Q.3 Write short notes (Any Four)** **20**
- a) Concept of valuation of Intellectual property and value realization
  - b) Protection of traditional knowledge
  - c) Bio technology and intellectual property
  - d) TRIPS & Access to Medicines
  - e) Concepts of confidentiality and information security
  - f) Copy right issues in creative works

<b>Seat No.</b>	
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- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

<b>Seat No.</b>	
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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works



Seat No.	
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Set **S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

<b>Seat No.</b>	
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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two)** **20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four)** **20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

Seat No.	
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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 2) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 3) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 4) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 5) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 6) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 7) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 8) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 9) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 10) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set 

R
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 2) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 3) Who is the father of Indology?
 

a) August Comte	b) Srinivas
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- 4) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions
- 5) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 6) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 7) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit



<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

Seat No.	
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Set	S
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

a) social conventions	b) social laws
c) dos and don'ts	d) governance
- 2) What is demography?
 

a) science of society	b) study of migration
c) science of population	d) study of races
- 3) Which of the following is applicable to tribal community?
 

a) Religion	b) Culture
c) Songs	d) Homogeneity
- 4) Who was the leader of the Narmada bachao movement?
 

a) Anna Hajare	b) Medha Patkar
c) H.N. Bahuguna	d) Kejriwal
- 5) Who is the founder of Satyashodhak samaj?
 

a) Vinoba Bhave	b) Mahatma Phule
c) M. Gandhi	d) Rajaram Mohanroy
- 6) Which is distinctive nature of family?
 

a) Small family	b) Large family
c) Bilateral unit	d) Unilateral unit
- 7) What is the percentage of potable water on the earth?
 

a) 2%	b) 3%
c) 5%	d) 7%
- 8) Which of the following is the reformist movement?
 

a) Chipko movement	b) Non-cooperation movement
c) Anti-Sati movement	d) Freedom movement
- 9) Who is the father of Indology?
 

a) August Comte	b) Srinivas
c) Ghurye	d) Aristotle
- 10) What is culture?
 

a) literature	b) way of life
c) food rituals	d) fashions

<b>Seat No.</b>	
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<b>Set</b>	<b>S</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

<b>Seat No.</b>	
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- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

<b>Seat No.</b>	
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**Set****P**

**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |



<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later      b) Drink alcohol to relax  
c) Break it down into smaller task      d) Avoid the task

<b>Seat No.</b>	
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<b>Set</b>	<b>R</b>
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |  |           |
|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

Seat No.	
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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

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|------------|--|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

<b>Seat No.</b>	
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## Max. Marks: 50

Marks:10

10

- Page 1 of 12



- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication

- Page 5 of 12

<b>Seat No.</b>	
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<b>Set Q</b>
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

Seat No.	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
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  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics



<b>Seat No.</b>	
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- a) Culture
- c) Society

- b) Value
- d) Moral

- a) Moral  
c) Values

- b) Ethics
- d) Positive and preferred values

<b>Seat No.</b>	
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
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c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

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P
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**INFORMATION TECHNOLOGY**  
**Software Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options .**

**14**

- 1) The software life cycle can be said to consist of a series of phases. The classical model is referred to as the waterfall model. Which phase defined as "The concept is explored and refined, and the client's requirements are elicited?"
  - a) Requirements
  - b) Specification
  - c) Design
  - d) Implementation
- 2) In the maintenance phase the product must be tested against previous test cases. This is known as \_\_\_\_\_ testing.
  - a) Unit
  - b) Integration
  - c) Regression
  - d) Module
- 3) The relationship between a derived class (or subclass) and base class is referred to as \_\_\_\_\_.
  - a) Association
  - b) Inheritance
  - c) Polymorphism
  - d) Instantiation
- 4) What is the essence of software engineering?
  - a) Requirements Definition, Design Representation, Knowledge Capture and Quality factors
  - b) Maintaining Configurations, Organizing Teams, Channeling Creativity and Planning resource Use
  - c) Time/Space Trade-offs, Optimizing Process, Minimizing Communication and Problem decomposition
  - d) Managing Complexity, Managing Personnel Resources, Managing Time and Money and Producing Useful Products
- 5) What are the major activities of the spiral model of software engineering?
  - a) Planning, Risk Analysis, Engineering, Customer Evaluation
  - b) Defining, Prototyping, Testing, Delivery
  - c) Requirements
  - d) Quick Design, Build Prototype, Evaluate Prototype, Refine Prototype
- 6) A process view in software engineering would consider which of the following?
  - a) Product performance
  - b) Staffing
  - c) Functionality
  - d) Reliability

- 7) What do you call, when the elements of a module, all operate on the same data?
- a) Functional cohesion
  - b) Temporal cohesion
  - c) Procedural cohesion
  - d) Communicational cohesion
- 8) A design is said to be a good design if the components are \_\_\_\_\_.  
a) Strongly coupled  
b) Weakly cohesive  
c) Strongly coupled and weakly cohesive  
d) Strongly cohesive and weakly coupled
- 9) In choosing a development life-cycle model, one would consider the \_\_\_\_\_.  
a) Development Group Expertise, Problem Characteristics, User Expectations  
b) Languages, Development Schedule, Competition  
c) System Context, User Population, Platforms  
d) Organizational Structure, User Tasks, Performance Criteria
- 10) Black box testing is also called \_\_\_\_\_.  
a) Specification-based testing- b) Structural testing
- c) Verification
- d) Unit testing

11) Prototyping is appropriate for \_\_\_\_\_.  
a) Data-oriented applications  
b) Applications with emphasis on the user interface  
c) Applications which are highly interactive  
d) All of these

12) What are the factors to be considered when planning a software development effort?  
a) Performance, Problem, Product, Planning  
b) People, Problem, Product, Process  
c) People, Problem, Productivity, Performance  
d) People, Problem, Product, Portability

13) A simple way of looking at the spiral software life-cycle model is as a waterfall model with each phase proceeded by \_\_\_\_\_.  
a) Build-and-fix- b) Freezing
- c) Synchronization
- d) Risk analysis

14) Problems with using Lines of Code to measure the size of a product include(s) \_\_\_\_\_.  
a) The creation of source code is only part of the development effort  
b) The Lines of Code (LOC) will differ between languages and cannot be measured for some languages  
c) The final size (KLOC) can only be determined once the product is delivered  
d) All of the above

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**Set****P**

**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**INFORMATION TECHNOLOGY**  
**Software Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.  
 4) Figures must be drawn wherever necessary.

**Section – I**

- Q.2 Attempt any Three** **12**
- What is Software Process? Explain the Characteristics of Software Process.
  - Illustrate in detail the software requirement process.
  - Construct a DFD for ATM payment system also identify the data dictionary of the system.
  - What is the role of Architecture in design? Also explain the component & connector view.
- Q.3 Attempt any One** **08**
- For specification and analysis explain with example DFD & ER diagrams.
  - Illustrate the Object Oriented Design w.r.t. design concepts with example.
- Q.4 Write short note on. (Any Two)** **08**
- Spiral model
  - Functional specification with use cases
  - Coupling and Cohesion

**Section – II**

- Q.5 Attempt any Three** **12**
- Differentiate between black box and white box testing.
  - Explain the project management process & inspection process.
  - Draw and extend the Iterative Project Management Life Cycle.
  - Justify with example Effort estimation, Project Schedule and Staffing.
- Q.6 Attempt any one** **08**
- Explain in detail Quality Concepts, Qualitative quality management planning, and CMM project management process w.r.t. project management.
  - Explain the most common techniques for structuring page table.
- Q.7 Attempt any Two** **08**
- Scrum Methodology
  - Project Monitoring Plan
  - Unit & System Testing

Seat No.	
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Set Q
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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**INFORMATION TECHNOLOGY**  
**Software Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options . 14**

- 1) A design is said to be a good design if the components are \_\_\_\_\_.
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  - b) Weakly cohesive
  - c) Strongly coupled and weakly cohesive
  - d) Strongly cohesive and weakly coupled
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  - b) People, Problem, Product, Process
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b) Maintaining Configurations, Organizing Teams, Channeling Creativity and Planning resource Use  
c) Time/Space Trade-offs, Optimizing Process, Minimizing Communication and Problem decomposition  
d) Managing Complexity, Managing Personnel Resources, Managing Time and Money and Producing Useful Products
- 12) What are the major activities of the spiral model of software engineering?  
a) Planning, Risk Analysis, Engineering, Customer Evaluation  
b) Defining, Prototyping, Testing, Delivery  
c) Requirements  
d) Quick Design, Build Prototype, Evaluate Prototype, Refine Prototype
- 13) A process view in software engineering would consider which of the following?  
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b) Staffing  
c) Functionality  
d) Reliability
- 14) What do you call, when the elements of a module, all operate on the same data?  
a) Functional cohesion  
b) Temporal cohesion  
c) Procedural cohesion  
d) Communicational cohesion



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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**INFORMATION TECHNOLOGY**  
**Software Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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 3) Assume suitable data if necessary.  
 4) Figures must be drawn wherever necessary.

**Section – I**

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  - Illustrate in detail the software requirement process.
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- For specification and analysis explain with example DFD & ER diagrams.
  - Illustrate the Object Oriented Design w.r.t. design concepts with example.
- Q.4 Write short note on. (Any Two)** **08**
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  - Functional specification with use cases
  - Coupling and Cohesion

**Section – II**

- Q.5 Attempt any Three** **12**
- Differentiate between black box and white box testing.
  - Explain the project management process & inspection process.
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  - Justify with example Effort estimation, Project Schedule and Staffing.
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- Explain in detail Quality Concepts, Qualitative quality management planning, and CMM project management process w.r.t. project management.
  - Explain the most common techniques for structuring page table.
- Q.7 Attempt any Two** **08**
- Scrum Methodology
  - Project Monitoring Plan
  - Unit & System Testing

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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**INFORMATION TECHNOLOGY**  
**Software Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options .**

**14**

- 1) Prototyping is appropriate for \_\_\_\_\_.  
 a) Data-oriented applications  
 b) Applications with emphasis on the user interface  
 c) Applications which are highly interactive  
 d) All of these
- 2) What are the factors to be considered when planning a software development effort?  
 a) Performance, Problem, Product, Planning  
 b) People, Problem, Product, Process  
 c) People, Problem, Productivity, Performance  
 d) People, Problem, Product, Portability
- 3) A simple way of looking at the spiral software life-cycle model is as a waterfall model with each phase proceeded by \_\_\_\_\_.  
 a) Build-and-fix  
 b) Freezing  
 c) Synchronization  
 d) Risk analysis
- 4) Problems with using Lines of Code to measure the size of a product include(s) \_\_\_\_\_.  
 a) The creation of source code is only part of the development effort  
 b) The Lines of Code (LOC) will differ between languages and cannot be measured for some languages  
 c) The final size (KLOC) can only be determined once the product is delivered  
 d) All of the above
- 5) The software life cycle can be said to consist of a series of phases. The classical model is referred to as the waterfall model. Which phase defined as "The concept is explored and refined, and the client's requirements are elicited?"  
 a) Requirements  
 b) Specification  
 c) Design  
 d) Implementation

- 6) In the maintenance phase the product must be tested against previous test cases. This is known as \_\_\_\_\_ testing.
- a) Unit
  - b) Integration
  - c) Regression
  - d) Module
- 7) The relationship between a derived class (or subclass) and base class is referred to as \_\_\_\_\_.
- a) Association
  - b) Inheritance
  - c) Polymorphism
  - d) Instantiation
- 8) What is the essence of software engineering?
- a) Requirements Definition, Design Representation, Knowledge Capture and Quality factors
  - b) Maintaining Configurations, Organizing Teams, Channeling Creativity and Planning resource Use
  - c) Time/Space Trade-offs, Optimizing Process, Minimizing Communication and Problem decomposition
  - d) Managing Complexity, Managing Personnel Resources, Managing Time and Money and Producing Useful Products
- 9) What are the major activities of the spiral model of software engineering?
- a) Planning, Risk Analysis, Engineering, Customer Evaluation
  - b) Defining, Prototyping, Testing, Delivery
  - c) Requirements
  - d) Quick Design, Build Prototype, Evaluate Prototype, Refine Prototype
- 10) A process view in software engineering would consider which of the following?
- a) Product performance
  - b) Staffing
  - c) Functionality
  - d) Reliability
- 11) What do you call, when the elements of a module, all operate on the same data?
- a) Functional cohesion
  - b) Temporal cohesion
  - c) Procedural cohesion
  - d) Communicational cohesion
- 12) A design is said to be a good design if the components are \_\_\_\_\_.
- a) Strongly coupled
  - b) Weakly cohesive
  - c) Strongly coupled and weakly cohesive
  - d) Strongly cohesive and weakly coupled
- 13) In choosing a development life-cycle model, one would consider the \_\_\_\_\_.
- a) Development Group Expertise, Problem Characteristics, User Expectations
  - b) Languages, Development Schedule, Competition
  - c) System Context, User Population, Platforms
  - d) Organizational Structure, User Tasks, Performance Criteria
- 14) Black box testing is also called \_\_\_\_\_.
- a) Specification-based testing
  - b) Structural testing
  - c) Verification
  - d) Unit testing

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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**INFORMATION TECHNOLOGY**  
**Software Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.  
 4) Figures must be drawn wherever necessary.

**Section – I**

- Q.2 Attempt any Three** **12**
- What is Software Process? Explain the Characteristics of Software Process.
  - Illustrate in detail the software requirement process.
  - Construct a DFD for ATM payment system also identify the data dictionary of the system.
  - What is the role of Architecture in design? Also explain the component & connector view.
- Q.3 Attempt any One** **08**
- For specification and analysis explain with example DFD & ER diagrams.
  - Illustrate the Object Oriented Design w.r.t. design concepts with example.
- Q.4 Write short note on. (Any Two)** **08**
- Spiral model
  - Functional specification with use cases
  - Coupling and Cohesion

**Section – II**

- Q.5 Attempt any Three** **12**
- Differentiate between black box and white box testing.
  - Explain the project management process & inspection process.
  - Draw and extend the Iterative Project Management Life Cycle.
  - Justify with example Effort estimation, Project Schedule and Staffing.
- Q.6 Attempt any one** **08**
- Explain in detail Quality Concepts, Qualitative quality management planning, and CMM project management process w.r.t. project management.
  - Explain the most common techniques for structuring page table.
- Q.7 Attempt any Two** **08**
- Scrum Methodology
  - Project Monitoring Plan
  - Unit & System Testing

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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**INFORMATION TECHNOLOGY**  
**Software Engineering**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options .**

**14**

- 1) A process view in software engineering would consider which of the following?
  - a) Product performance
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  - c) Functionality
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- 2) What do you call, when the elements of a module, all operate on the same data?
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- 3) A design is said to be a good design if the components are \_\_\_\_\_.
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- 5) Black box testing is also called \_\_\_\_\_.
  - a) Specification-based testing
  - b) Structural testing
  - c) Verification
  - d) Unit testing
- 6) Prototyping is appropriate for \_\_\_\_\_.
  - a) Data-oriented applications
  - b) Applications with emphasis on the user interface
  - c) Applications which are highly interactive
  - d) All of these

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**T. Y. (B.Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**INFORMATION TECHNOLOGY**  
**Software Engineering**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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**Section – I**

- Q.2 Attempt any Three** **12**
- a) What is Software Process? Explain the Characteristics of Software Process.
  - b) Illustrate in detail the software requirement process.
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  - d) What is the role of Architecture in design? Also explain the component & connector view.
- Q.3 Attempt any One** **08**
- a) For specification and analysis explain with example DFD & ER diagrams.
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- Q.4 Write short note on. (Any Two)** **08**
- a) Spiral model
  - b) Functional specification with use cases
  - c) Coupling and Cohesion

**Section – II**

- Q.5 Attempt any Three** **12**
- a) Differentiate between black box and white box testing.
  - b) Explain the project management process & inspection process.
  - c) Draw and extend the Iterative Project Management Life Cycle.
  - d) Justify with example Effort estimation, Project Schedule and Staffing.
- Q.6 Attempt any one** **08**
- a) Explain in detail Quality Concepts, Qualitative quality management planning, and CMM project management process w.r.t. project management.
  - b) Explain the most common techniques for structuring page table.
- Q.7 Attempt any Two** **08**
- a) Scrum Methodology
  - b) Project Monitoring Plan
  - c) Unit & System Testing

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Artificial Intelligence**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is used as a variable in Breadth - First search.
  - a) NODE-LIST
  - b) SUCCESSER-LIST
  - c) CHILD-LIST
  - d) ALL
- 2) A \_\_\_\_\_ is an area of the search space that is higher than surrounding areas and that itself has a slope.
  - a) Ridge
  - b) local maximum
  - c) plateau
  - d) All
- 3) \_\_\_\_\_ Graphs are used in problem reduction.
  - a) NOT
  - b) AND-NOT
  - c) AND-OR
  - d) INVERSE
- 4) \_\_\_\_\_ is the task domain at AI.
  - a) Formal tasks
  - b) Informal tasks
  - c) Objective tasks
  - d) None of these
- 5) \_\_\_\_\_ rules are applied for water-jug problem.
  - a) System
  - b) Production
  - c) Symbolic
  - d) All
- 6) A \_\_\_\_\_ is a technique that improves the efficiency of a search process.
  - a) Production system
  - b) Problem system
  - c) Heuristic
  - d) None of these
- 7) All the moves from the current state and selected the best one as the next state, is called as \_\_\_\_\_.
  - a) Steepest-ascent hill climbing
  - b) Simple hill climbing
  - c) Generate and test
  - d) None of these
- 8) \_\_\_\_\_ is a search procedure that operate in a space of constraint sets.
  - a) Constraint validation
  - b) Constriction verification
  - c) Constraint satisfaction
  - d) None of these
- 9) "V" logical symbol means \_\_\_\_\_.
  - a) there exists
  - b) or
  - c) note
  - d) for all



- 10)** Artificial Intelligences is the study of how to make computers do things which, at the moment \_\_\_\_\_ do better.
- |            |           |
|------------|-----------|
| a) Human   | b) People |
| c) machine | d) all    |
- 11)** \_\_\_\_\_ is one of the Mundane task.
- |                |                |
|----------------|----------------|
| a) Perception  | b) Games       |
| c) Mathematics | d) Engineering |
- 12)** AI research is that \_\_\_\_\_ requires knowledge.
- |                 |              |
|-----------------|--------------|
| a) Talent       | b) smartness |
| c) intelligence | d) all       |
- 13)** The first requirement of a good control strategy is that it causes \_\_\_\_\_.
- |            |                  |
|------------|------------------|
| a) Speed   | b) motion        |
| c) failure | d) None of these |
- 14)** \_\_\_\_\_ search requires less memory since only the nodes on the current path are stored.
- |                  |                  |
|------------------|------------------|
| a) Breadth-first | b) Heuristic     |
| c) Depth-first   | d) None of these |

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Artificial Intelligence**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What is AI? What makes a problem a candidate to be solved by AI?
- b) What are Heuristics? How are they used in search?
- c) Give the advantage of using 'Breadth first search' method of search.
- d) What are the related issues in the designing of search programs?
- e) Compare between Breadth first search and Best first search algorithms.

**Q.3 Attempt any TWO.** **08**

- a) Which of the following problems are candidates to be solved by AI? Justify the same.
  - 1) Chess
  - 2) Water Jug
  - 3) Raining in India
- b) State and explain the A\* algorithm.
- c) Compare between beam search and Taboo search algorithms.

**Q.4 Attempt any ONE.** **08**

- a) List the properties of a good Knowledge representation system? Illustrate each property with an example.
- b) What Search algorithms would you use to solve a "Monkey and Banana" problem? Justify your answer.

The problem is stated as - A monkey is in a room. Suspended from the ceiling is a bunch of bananas, beyond the monkey's reach. However, in the room there are also a chair and a stick. The ceiling is just the right height so that a monkey standing on a chair could knock the bananas down with the stick. The monkey knows how to move around, carry other things around, reach for the bananas, and wave a stick in the air. Find the best sequence of actions for the monkey?

**Section – II**

**Q.5 Attempt any FOUR.** **12**

- a) What is a rule-based system? Give its architecture.
- b) Give the semantic network for 'Postmen dress in Khaki'.
- c) What is default reasoning? Illustrate.
- d) Illustrate the terms 'Measures of belief and disbelief'.
- e) State the characteristics that an expert system should possess.

**Q.6 Attempt any TWO.**

- a) What is backward chaining? Illustrate the steps involved.
- b) List the requirements of CD theory? Illustrate each with an example.
- c) Illustrate the working of cut operator in Prolog with an example.

**Q.7 Attempt any ONE.**

- a) What are the components of an expert system? Elaborate on each component.
- b) What is planning? How is it carried out?

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Artificial Intelligence**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) \_\_\_\_\_ is a search procedure that operate in a space of constraint sets.
  - a) Constraint validation
  - b) Constriction verification
  - c) Constraint satisfaction
  - d) None of these
- 2) "V" logical symbol means \_\_\_\_\_.
  - a) there exists
  - b) or
  - c) note
  - d) for all
- 3) Artificial Intelligences is the study of how to make computers do things which, at the moment \_\_\_\_\_ do better.
  - a) Human
  - b) People
  - c) machine
  - d) all
- 4) \_\_\_\_\_ is one of the Mundane task.
  - a) Perception
  - b) Games
  - c) Mathematics
  - d) Engineering
- 5) AI research is that \_\_\_\_\_ requires knowledge.
  - a) Talent
  - b) smartness
  - c) intelligence
  - d) all
- 6) The first requirement of a good control strategy is that it causes \_\_\_\_\_.
  - a) Speed
  - b) motion
  - c) failure
  - d) None of these
- 7) \_\_\_\_\_ search requires less memory since only the nodes on the current path are stored.
  - a) Breadth-first
  - b) Heuristic
  - c) Depth-first
  - d) None of these
- 8) \_\_\_\_\_ is used as a variable in Breadth - First search.
  - a) NODE-LIST
  - b) SUCCESSER-LIST
  - c) CHILD-LIST
  - d) ALL
- 9) A \_\_\_\_\_ is an area of the search space that is higher than surrounding areas and that itself has a slope.
  - a) Ridge
  - b) local maximum
  - c) plateau
  - d) All

- 10) \_\_\_\_\_ Graphs are used in problem reduction.  
a) NOT b) AND-NOT  
c) AND-OR d) INVERSE
- 11) \_\_\_\_\_ is the task domain at AI.  
a) Formal tasks b) Informal tasks  
c) Objective tasks d) None of these
- 12) \_\_\_\_\_ rules are applied for water-jug problem.  
a) System b) Production  
c) Symbolic d) All
- 13) A \_\_\_\_\_ is a technique that improves the efficiency of a search process.  
a) Production system b) Problem system  
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a) Steepest-ascent hill climbing b) Simple hill climbing  
c) Generate and test d) None of these

<b>Seat No.</b>	
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Artificial Intelligence**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
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**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What is AI? What makes a problem a candidate to be solved by AI?
- b) What are Heuristics? How are they used in search?
- c) Give the advantage of using 'Breadth first search' method of search.
- d) What are the related issues in the designing of search programs?
- e) Compare between Breadth first search and Best first search algorithms.

**Q.3 Attempt any TWO.** **08**

- a) Which of the following problems are candidates to be solved by AI? Justify the same.
  - 1) Chess
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- b) State and explain the A\* algorithm.
- c) Compare between beam search and Taboo search algorithms.

**Q.4 Attempt any ONE.** **08**

- a) List the properties of a good Knowledge representation system? Illustrate each property with an example.
- b) What Search algorithms would you use to solve a "Monkey and Banana" problem? Justify your answer.  
 The problem is stated as - A monkey is in a room. Suspended from the ceiling is a bunch of bananas, beyond the monkey's reach. However, in the room there are also a chair and a stick. The ceiling is just the right height so that a monkey standing on a chair could knock the bananas down with the stick. The monkey knows how to move around, carry other things around, reach for the bananas, and wave a stick in the air. Find the best sequence of actions for the monkey?

**Section – II**

**Q.5 Attempt any FOUR.** **12**

- a) What is a rule-based system? Give its architecture.
- b) Give the semantic network for 'Postmen dress in Khaki'.
- c) What is default reasoning? Illustrate.
- d) Illustrate the terms 'Measures of belief and disbelief'.
- e) State the characteristics that an expert system should possess.

**Q.6 Attempt any TWO.**

- a) What is backward chaining? Illustrate the steps involved.
- b) List the requirements of CD theory? Illustrate each with an example.
- c) Illustrate the working of cut operator in Prolog with an example.

**08****Q.7 Attempt any ONE.**

- a) What are the components of an expert system? Elaborate on each component.
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Artificial Intelligence**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is one of the Mundane task.
 

a) Perception	b) Games
c) Mathematics	d) Engineering
- 2) AI research is that \_\_\_\_\_ requires knowledge.
 

a) Talent	b) smartness
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a) Breadth-first	b) Heuristic
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Artificial Intelligence**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What is AI? What makes a problem a candidate to be solved by AI?
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- c) Give the advantage of using 'Breadth first search' method of search.
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- e) Compare between Breadth first search and Best first search algorithms.

**Q.3 Attempt any TWO.** **08**

- a) Which of the following problems are candidates to be solved by AI? Justify the same.
  - 1) Chess
  - 2) Water Jug
  - 3) Raining in India
- b) State and explain the A\* algorithm.
- c) Compare between beam search and Taboo search algorithms.

**Q.4 Attempt any ONE.** **08**

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**Section – II**

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**Q.6 Attempt any TWO.**

- a) What is backward chaining? Illustrate the steps involved.
- b) List the requirements of CD theory? Illustrate each with an example.
- c) Illustrate the working of cut operator in Prolog with an example.

**Q.7 Attempt any ONE.**

- a) What are the components of an expert system? Elaborate on each component.
- b) What is planning? How is it carried out?

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Artificial Intelligence**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) A \_\_\_\_\_ is a technique that improves the efficiency of a search process.
  - a) Production system
  - b) Problem system
  - c) Heuristic
  - d) None of these
- 2) All the moves from the current state and selected the best one as the next state, is called as \_\_\_\_\_.
  - a) Steepest-ascent hill climbing
  - b) Simple hill climbing
  - c) Generate and test
  - d) None of these
- 3) \_\_\_\_\_ is a search procedure that operate in a space of constraint sets.
  - a) Constraint validation
  - b) Constriction verification
  - c) Constraint satisfaction
  - d) None of these
- 4) "V" logical symbol means \_\_\_\_\_.
  - a) there exists
  - b) or
  - c) note
  - d) for all
- 5) Artificial Intelligences is the study of how to make computers do things which, at the moment \_\_\_\_\_ do better.
  - a) Human
  - b) People
  - c) machine
  - d) all
- 6) \_\_\_\_\_ is one of the Mundane task.
  - a) Perception
  - b) Games
  - c) Mathematics
  - d) Engineering
- 7) AI research is that \_\_\_\_\_ requires knowledge.
  - a) Talent
  - b) smartness
  - c) intelligence
  - d) all
- 8) The first requirement of a good control strategy is that it causes \_\_\_\_\_.
  - a) Speed
  - b) motion
  - c) failure
  - d) None of these
- 9) \_\_\_\_\_ search requires less memory since only the nodes on the current path are stored.
  - a) Breadth-first
  - b) Heuristic
  - c) Depth-first
  - d) None of these

- 10)** \_\_\_\_\_ is used as a variable in Breadth - First search.
- |               |                   |
|---------------|-------------------|
| a) NODE-LIST  | b) SUCCESSER-LIST |
| c) CHILD-LIST | d) ALL            |
- 11)** A \_\_\_\_\_ is an area of the search space that is higher than surrounding areas and that itself has a slope.
- |            |                  |
|------------|------------------|
| a) Ridge   | b) local maximum |
| c) plateau | d) All           |
- 12)** \_\_\_\_\_ Graphs are used in problem reduction.
- |           |            |
|-----------|------------|
| a) NOT    | b) AND-NOT |
| c) AND-OR | d) INVERSE |
- 13)** \_\_\_\_\_ is the task domain at AI.
- |                    |                   |
|--------------------|-------------------|
| a) Formal tasks    | b) Informal tasks |
| c) Objective tasks | d) None of these  |
- 14)** \_\_\_\_\_ rules are applied for water-jug problem.
- |             |               |
|-------------|---------------|
| a) System   | b) Production |
| c) Symbolic | d) All        |

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<b>Set</b>	<b>S</b>
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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Artificial Intelligence**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What is AI? What makes a problem a candidate to be solved by AI?
- b) What are Heuristics? How are they used in search?
- c) Give the advantage of using 'Breadth first search' method of search.
- d) What are the related issues in the designing of search programs?
- e) Compare between Breadth first search and Best first search algorithms.

**Q.3 Attempt any TWO.** **08**

- a) Which of the following problems are candidates to be solved by AI? Justify the same.
  - 1) Chess
  - 2) Water Jug
  - 3) Raining in India
- b) State and explain the A\* algorithm.
- c) Compare between beam search and Taboo search algorithms.

**Q.4 Attempt any ONE.** **08**

- a) List the properties of a good Knowledge representation system? Illustrate each property with an example.
- b) What Search algorithms would you use to solve a "Monkey and Banana" problem? Justify your answer.

The problem is stated as - A monkey is in a room. Suspended from the ceiling is a bunch of bananas, beyond the monkey's reach. However, in the room there are also a chair and a stick. The ceiling is just the right height so that a monkey standing on a chair could knock the bananas down with the stick. The monkey knows how to move around, carry other things around, reach for the bananas, and wave a stick in the air. Find the best sequence of actions for the monkey?

**Section – II**

**Q.5 Attempt any FOUR.** **12**

- a) What is a rule-based system? Give its architecture.
- b) Give the semantic network for 'Postmen dress in Khaki'.
- c) What is default reasoning? Illustrate.
- d) Illustrate the terms 'Measures of belief and disbelief'.
- e) State the characteristics that an expert system should possess.

**Q.6 Attempt any TWO.**

- a) What is backward chaining? Illustrate the steps involved.
- b) List the requirements of CD theory? Illustrate each with an example.
- c) Illustrate the working of cut operator in Prolog with an example.

**Q.7 Attempt any ONE.**

- a) What are the components of an expert system? Elaborate on each component.
- b) What is planning? How is it carried out?

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- 7) Which of the following is an unsupervised task?
- a) Learning to play chess
  - b) Predicting if a new edible item is sweet or spicy based on the information of the ingredients, their quantities, and labels (sweet or spicy) for many other similar dishes.
  - c) Grouping related documents from an unannotated corpus.
  - d) All of the above

- 8) Which of the following is a categorical feature?
- a) Number of hours you study in a day
  - b) Branch of an engineering student
  - c) Your weekly expenditure in rupees
  - d) Height of a person in inches

- 9) For a binary classification problem, the decision boundary resulting from the use of logistic regression is \_\_\_\_.
- a) linear
  - b) sigmoid
  - c) parabolic
  - d) exponential

- 10) Consider following confusion matrix, calculate the number of participants that have been wrongly classified as female?

	Actual Male	Actual Female
Predicted Male	950	50
Predicted Female	15	985

- a) 15
  - b) 50
  - c) 950
  - d) 985
- 11) Which of the following functions can be used to split the data into train and test?
- a) `Pandas.train_test_split()`
  - b) `numpy.train_test_split()`
  - c) `sklearn.model_selection.train_test_split()`
  - d) `sklearn.train_test_split()`
- 12) To find the \_\_\_\_ you put all numbers in order from least to greatest and find the number that is in the middle.
- a) mean
  - b) median
  - c) mode
  - d) range



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Set P
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**T.Y. (B.Tech.) (Sem - II) (New) CBCS Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Science**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All questions are compulsory.

**Section-I**

**Q.2 Attempt any three of the following questions.**

**12**

1) Find Inverse of Given matrix A

A=

2	0	3
-2	3	-4
-3	1	-4

- 2) A booklet has 12 pages with the following numbers of words:  
 271, 354, 296, 301, 333, 326, 285, 298, 327, 316, 287 and 314  
 What is the standard deviation number of words per page?
- 3) Define Various types of variables. Give one example of each type.
- 4) Explain Simpson's Paradox and Central Limit Theorem.

**Q.3 Attempt any one of the following questions.**

**08**

1) What is correlation & Causation?

John is an investor. His portfolio primarily tracks the performance of the S&P 500 and John wants to add the stock of Apple Inc. Before adding Apple to his portfolio, he wants to assess the correlation between the stock and the S&P 500 to ensure that adding the stock won't increase the systematic risk of his portfolio. Find correlation the stock and the S&P 500

	S&P 500	Apple
2013	1691.75	68.96
2014	1977.80	100.11
2015	1884.09	109.06
2016	2151.13	112.18
2017	2519.36	154.12

- 2) Find mode, mean, median, range and 25% quantile, 75% quantile for following data.

Year	Income (in million Rs.)
2001-2002	50.9
2002-2003	127.2
2003-2004	189.9
2004-2005	536.6
2005-2006	768.7
2006-2007	1084.5
2007-2008	1235.6
2008-2009	2064.5
2009-2010	2456.8
2001-2002	3090.4

- Q.4** Consider the experiment: Two dice are tossed.

08

The Random Variable is  $X = \text{"The product of the scores on the two dice"}$ .

Write down sample space and probability for  $x = 36, 12, 6$ .

Also find the value of  $X$  for which probability will be  $1/9$ .

### Section – II

- Q.5** Attempt any three of the following questions.

12

- 1) Explain following terms w.r.t. Support Vector Machine.
  - a) Hyperplane
  - b) Support vectors
  - c) Linear SVM
  - d) Kernel Functions
- 2) Compare types of machine learning.
- 3) Explain working of decision tree algorithm.
- 4) What is regression? Explain various types of regression.

- Q.6** Attempt any one of the following questions.

08

- 1) For the given confusion matrix, compute accuracy, recall, precision and F2-score.

	Apple	Orange	Mango
Apple	7	8	9
Orange	1	2	3
Mango	3	2	1

- 2) Consider following dataset for given instance  $X = (\text{Childless, old, and High})$ , what will be the prediction of Naive bays algorithm?

Type of family structure	Age group	Income status	Will they buy a car?
Nuclear	Young	Low	Yes
Extended	Old	Low	No
Childless	Middle-aged	Low	No
Childless	Young	Medium	Yes
Single Parent	Middle-aged	Medium	Yes
Childless	Young	Low	No
Nuclear	Old	High	Yes
Nuclear	Middle-aged	Medium	Yes
Extended	Middle-aged	High	Yes
Single Parent	Old	Low	No

- Q.7** Explain working of KNN algorithm. Consider following dataset and Predict class of instance (55,165) using KNN algorithm for  $k = 3$ .

**08**

Weight(x2)	Height(y2)	Class
51	167	Underweight
62	182	Normal
69	176	Normal
64	173	Normal
65	172	Normal
56	174	Underweight
58	169	Normal
57	173	Normal
55	170	Normal

Seat No.	
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**T.Y. (B.Tech.) (Sem - II) (New) CBCS Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Science**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**Q.1 Choose correct alternatives.**

**14**

- 1) Which of the following is a categorical feature?
  - a) Number of hours you study in a day
  - b) Branch of an engineering student
  - c) Your weekly expenditure in rupees
  - d) Height of a person in inches
- 2) For a binary classification problem, the decision boundary resulting from the use of logistic regression is \_\_\_\_\_.
  - a) linear
  - b) sigmoid
  - c) parabolic
  - d) exponential
- 3) Consider following confusion matrix, calculate the number of participants that have been wrongly classified as female?

	Actual Male	Actual Female
Predicted Male	950	50
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- a) 15
  - b) 50
  - c) 950
  - d) 985
- 4) Which of the following functions can be used to split the data into train and test?
  - a) Pandas.train\_test\_split()
  - b) numpy.train\_test\_split()
  - c) sklearn.model\_selection.train\_test\_split()
  - d) sklearn.train\_test\_split()
- 5) To find the \_\_\_\_ you put all numbers in order from least to greatest and find the number that is in the middle.
  - a) mean
  - b) median
  - c) mode
  - d) range



- 10)** Which of the package is used for visualization in Python?

  - a) ggplot
  - b) matplotlib
  - c) seaborn
  - d) All of the above
- 11)** The command used for reading a text file in python is \_\_\_\_.

  - a) read\_csv
  - b) read\_table
  - c) read\_excel
  - d) both a and b
- 12)** The probability of two different events occurring at the same time is known as \_\_\_\_.

  - a) Marginal probability
  - b) Conditional probability
  - c) Joint probability
  - d) Marginal and joint probability
- 13)** Package that deals with dataframe is \_\_\_\_.

  - a) numpy
  - b) dataframe
  - c) pandas
  - d) math
- 14)** Which of the following is an unsupervised task?

  - a) Learning to play chess
  - b) Predicting if a new edible item is sweet or spicy based on the information of the ingredients, their quantities, and labels (sweet or spicy) for many other similar dishes.
  - c) Grouping related documents from an unannotated corpus.
  - d) All of the above



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Set Q

**T.Y. (B.Tech.) (Sem - II) (New) CBCS Examination: Oct/Nov-2022**  
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**Data Science**

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**Instructions:** 1) Figures to the right indicates full marks.  
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**Section-I**

**Q.2 Attempt any three of the following questions.**

12

1) Find Inverse of Given matrix A

A=

2	0	3
-2	3	-4
-3	1	-4

- 2) A booklet has 12 pages with the following numbers of words: 271, 354, 296, 301, 333, 326, 285, 298, 327, 316, 287 and 314. What is the standard deviation number of words per page?
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Write down sample space and probability for  $x = 36, 12, 6$ .

Also find the value of  $X$  for which probability will be  $1/9$ .

### Section – II

- Q.5** Attempt any three of the following questions.

12

- 1) Explain following terms w.r.t. Support Vector Machine.
  - a) Hyperplane
  - b) Support vectors
  - c) Linear SVM
  - d) Kernel Functions
- 2) Compare types of machine learning.
- 3) Explain working of decision tree algorithm.
- 4) What is regression? Explain various types of regression.

- Q.6** Attempt any one of the following questions.

08

- 1) For the given confusion matrix, compute accuracy, recall, precision and F2-score.

	Apple	Orange	Mango
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Childless	Young	Low	No
Nuclear	Old	High	Yes
Nuclear	Middle-aged	Medium	Yes
Extended	Middle-aged	High	Yes
Single Parent	Old	Low	No

- Q.7** Explain working of KNN algorithm. Consider following dataset and Predict class of instance (55,165) using KNN algorithm for k =3.

**08**

Weight(x2)	Height(y2)	Class
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Day & Date: Wednesday, 22-02-2023  
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Max. Marks: 70

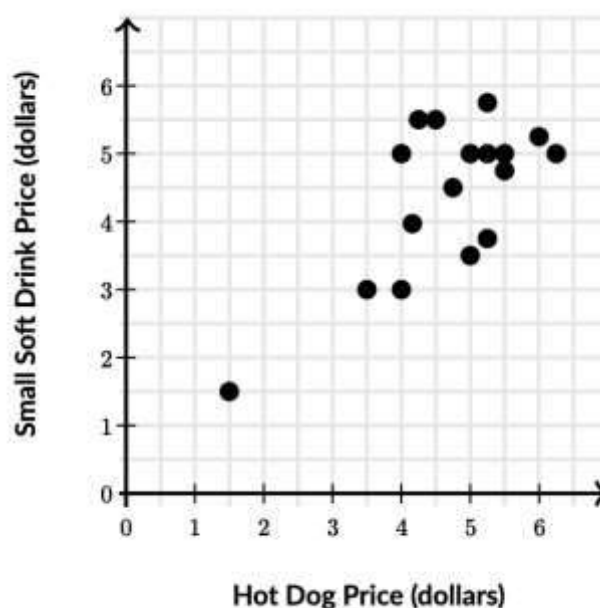
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**Q.1 Choose correct alternatives.**

14

- 1) Which of the following functions can be used to split the data into train and test?
  - a) `Pandas.train_test_split()`
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  - c) `sklearn.model_selection.train_test_split()`
  - d) `sklearn.train_test_split()`
- 2) To find the \_\_\_\_\_ you put all numbers in order from least to greatest and find the number that is in the middle.
  - a) mean
  - b) median
  - c) mode
  - d) range
- 3) The scatterplot shows the price of a hot dog and a small drink at seventeen different baseball stadiums. Based on the scatterplot, which of the following statements is true?



- |   |   |   |
|---|---|---|
| 1 | 2 | 3 |
| 2 | 3 | 5 |
| 3 | 4 | 7 |
| 4 | 5 | 9 |

- |   |    |    |
|---|----|----|
| 4 | 9  | 6  |
| 2 | 8  | 4  |
| 5 | 10 | 15 |

- a) numpy                      b) dataframe  
c) pandas                     d) math

- 11) Which of the following is an unsupervised task?
- a) Learning to play chess
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Set **R**

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**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Science**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All questions are compulsory.

**Section-I****Q.2 Attempt any three of the following questions.****12****1) Find Inverse of Given matrix A**

A=

2	0	3
-2	3	-4
-3	1	-4

- 2)** A booklet has 12 pages with the following numbers of words:  
 271, 354, 296, 301, 333, 326, 285, 298, 327, 316, 287 and 314  
 What is the standard deviation number of words per page?
- 3)** Define Various types of variables. Give one example of each type.
- 4)** Explain Simpson's Paradox and Central Limit Theorem.

**Q.3 Attempt any one of the following questions.****08****1) What is correlation & Causation?**

John is an investor. His portfolio primarily tracks the performance of the S&P 500 and John wants to add the stock of Apple Inc. Before adding Apple to his portfolio, he wants to assess the correlation between the stock and the S&P 500 to ensure that adding the stock won't increase the systematic risk of his portfolio. Find correlation the stock and the S&P 500

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- 2) Find mode, mean, median, range and 25% quantile, 75% quantile for following data.

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2008-2009	2064.5
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2001-2002	3090.4

- Q.4** Consider the experiment: Two dice are tossed.

08

The Random Variable is  $X = \text{"The product of the scores on the two dice"}$ .

Write down sample space and probability for  $x = 36, 12, 6$ .

Also find the value of  $X$  for which probability will be  $1/9$ .

### Section – II

- Q.5** Attempt any three of the following questions.

12

- 1) Explain following terms w.r.t. Support Vector Machine.
  - a) Hyperplane
  - b) Support vectors
  - c) Linear SVM
  - d) Kernel Functions
- 2) Compare types of machine learning.
- 3) Explain working of decision tree algorithm.
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08

- 1) For the given confusion matrix, compute accuracy, recall, precision and F2-score.

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- Q.7** Explain working of KNN algorithm. Consider following dataset and Predict class of instance (55,165) using KNN algorithm for  $k = 3$ .

**08**

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58	169	Normal
57	173	Normal
55	170	Normal

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- 11) Determinant of matrix, rounded off to zeroth decimal place is \_\_\_\_\_.

4	9	6
2	8	4
5	10	15

- a) 110                                      b) 120  
c) 0                                         d) 1
- 12) Which of the package is used for visualization in Python?  
a) ggplot                                      b) matplotlib  
c) seaborn                                    d) All of the above
- 13) The command used for reading a text file in python is \_\_\_\_\_.  
a) read\_csv                                    b) read\_table  
c) read\_excel                                 d) both a and b
- 14) The probability of two different events occurring at the same time is known as \_\_\_\_\_.  
a) Marginal probability                      b) Conditional probability  
c) Joint probability                            d) Marginal and joint probability

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Set **S**

**T.Y. (B.Tech.) (Sem - II) (New) CBCS Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Science**

Day & Date: Wednesday, 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All questions are compulsory.

**Section-I****Q.2 Attempt any three of the following questions.****12****1)** Find Inverse of Given matrix A

A=

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2016	2151.13	112.18
2017	2519.36	154.12

- 2) Find mode, mean, median, range and 25% quantile, 75% quantile for following data.

Year	Income (in million Rs.)
2001-2002	50.9
2002-2003	127.2
2003-2004	189.9
2004-2005	536.6
2005-2006	768.7
2006-2007	1084.5
2007-2008	1235.6
2008-2009	2064.5
2009-2010	2456.8
2001-2002	3090.4

- Q.4** Consider the experiment: Two dice are tossed.

08

The Random Variable is  $X = \text{"The product of the scores on the two dice"}$ .

Write down sample space and probability for  $x = 36, 12, 6$ .

Also find the value of  $X$  for which probability will be  $1/9$ .

### Section – II

- Q.5** Attempt any three of the following questions.

12

- 1) Explain following terms w.r.t. Support Vector Machine.
  - a) Hyperplane
  - b) Support vectors
  - c) Linear SVM
  - d) Kernel Functions
- 2) Compare types of machine learning.
- 3) Explain working of decision tree algorithm.
- 4) What is regression? Explain various types of regression.

- Q.6** Attempt any one of the following questions.

08

- 1) For the given confusion matrix, compute accuracy, recall, precision and F2-score.

	Apple	Orange	Mango
Apple	7	8	9
Orange	1	2	3
Mango	3	2	1

- 2) Consider following dataset for given instance X= (Childless, old, and High), what will be the prediction of Naive bays algorithm?

Type of family structure	Age group	Income status	Will they buy a car?
Nuclear	Young	Low	Yes
Extended	Old	Low	No
Childless	Middle-aged	Low	No
Childless	Young	Medium	Yes
Single Parent	Middle-aged	Medium	Yes
Childless	Young	Low	No
Nuclear	Old	High	Yes
Nuclear	Middle-aged	Medium	Yes
Extended	Middle-aged	High	Yes
Single Parent	Old	Low	No

- Q.7** Explain working of KNN algorithm. Consider following dataset and Predict class of instance (55,165) using KNN algorithm for k =3.

**08**

Weight(x2)	Height(y2)	Class
51	167	Underweight
62	182	Normal
69	176	Normal
64	173	Normal
65	172	Normal
56	174	Underweight
58	169	Normal
57	173	Normal
55	170	Normal

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Set

P

**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**User Interface Technologies**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) In the network HTTP resources are located by \_\_\_\_\_.  
 a) uniform resource identifier      b) unique resource locator  
 c) unique resource identifier      d) none of the mentioned
- 2) HTTP client requests by establishing a \_\_\_\_\_ connection to a particular port on the server.  
 a) user datagram protocol  
 b) transmission control protocol  
 c) broader gateway protocol  
 d) none of the mentioned
- 3) In FTP protocol, client contacts server using \_\_\_\_\_ as the transport protocol.  
 a) Transmission control protocol  
 b) user datagram protocol  
 c) datagram congestion control protocol  
 d) stream control transmission protocol
- 4) <b> tag makes the enclosed text bold. What is other tag to make text bold?  
 a) <strong>      b) <dar>  
 c) <black>      d) <emp>
- 5) What is the correct HTML for making a hyperlink?  
 a) <a href="http:// abc.com">ICT Trends Quiz</a>  
 b) <a name="https://abc.com">ICT Trends Quiz</a>  
 c) <https:// abc.com</a>  
 d) url="https:// abc.com">ICT Trends Quiz
- 6) To create a combo box (drop down box) which tag will you use?  
 a) <select>      b) <list>  
 c) <input type="dropdown">      d) all of above



- 7) FTP uses One port number (21) is used for \_\_\_\_\_ and another one for \_\_\_\_\_ Direct sequence.
- a) data transfer, control connection
  - b) socket connection, data transfer
  - c) control connection, data transfer
  - d) control connection, socket connection
- 8) Which attribute is used to name an element uniquely?
- a) class
  - b) id
  - c) dot
  - d) all of above
- 9) HTML (Hyper Text Markup Language) to specify \_\_\_\_\_ of web pages.
- a) style
  - b) the content and structure
  - c) both
  - d) none
- 10) JavaScript is a language that helps you build \_\_\_\_\_ web pages.
- a) dynamic
  - b) coloring
  - c) positioning
  - d) none

<b>Seat No.</b>	
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**User Interface Technologies**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All question are compulsory.  
2) Section I and Section II are compulsory.

- Q.2 Solve any four.** **20**
- a) What are the various elements provided by HTML5 for media content?
  - b) Differentiate between SMTP and POP3.
  - c) What is HTML5?
  - d) Explain 2D and 3D transformation of CSS3.
  - e) What is responsive web design?
- Q.3 Solve any two.** **12**
- a) Explain HTTP request response for dynamic web pages.
  - b) What is HTML5 API web storage?
  - c) Explain JSON.
- Q.4 Explain j query for Animation effect** **08**

<b>Seat No.</b>	
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Day & Date: Friday, 24-02-2023  
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Marks: 10

10

- Page 4 of 12

- 8) In FTP protocol, client contacts server using \_\_\_\_\_ as the transport protocol.
- a) Transmission control protocol
  - b) user datagram protocol
  - c) datagram congestion control protocol
  - d) stream control transmission protocol
- 9) <b> tag makes the enclosed text bold. What is other tag to make text bold?
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Max. Marks: 40

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  - c) Explain JSON.
- Q.4 Explain j query for Animation effect** **08**

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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
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**User Interface Technologies**

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Max. Marks: 50

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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) HTML (Hyper Text Markup Language) to specify \_\_\_\_\_ of web pages.
  - a) style
  - b) the content and structure
  - c) both
  - d) none
- 2) JavaScript is a language that helps you build \_\_\_\_\_ web pages.
  - a) dynamic
  - b) coloring
  - c) positioning
  - d) none
- 3) In the network HTTP resources are located by \_\_\_\_\_.
  - a) uniform resource identifier
  - b) unique resource locator
  - c) unique resource identifier
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- 4) HTTP client requests by establishing a \_\_\_\_\_ connection to a particular port on the server.
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- 10) Which attribute is used to name an element uniquely?
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
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  - c) Explain JSON.
- Q.4 Explain j query for Animation effect** **08**

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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Agile Project Management**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10**

- 1) Select the option that suits the Manifesto for Agile Software Development
  - a) Individuals and interactions      b) Working software
  - c) Customer collaboration      d) All of the mentioned
- 2) Agile Software Development is based on
  - a) Incremental Development
  - b) Iterative Development
  - c) Linear Development
  - d) Both incremental and iterative Development
- 3) When forming an Agile project team it is BEST to use
  - a) Generalized specialists
  - b) Top management officials
  - c) Highly specialized developers
  - d) All of the above
- 4) Which Agile methodology advocates the use of problem domain?
  - a) Extreme programming (XP)
  - b) Future Driven Development (FDD)
  - c) Scrum
  - d) Evo
- 5) Scrum Teams are
  - a) Self organizing, cross functional
  - b) Cross productive, self organizing
  - c) Self-destructive, self-motivating
  - d) Non-productive, Selfish
- 6) Agile software engineering demonstrated to deliver successful systems quickly.
  - a) True      b) False
- 7) Amongst which of the following is/are the type of agile methodologies.
  - a) Scrum      b) FDD
  - c) DSDM      d) All of these

- 8)** Which of the following option is used to measure the size of a user story for an agile Project?
- |                   |                         |
|-------------------|-------------------------|
| a) Story points   | b) Functional point     |
| c) Velocity point | d) Work breakdown point |
- 9)** How many phases are there in Scrum?
- |         |                            |
|---------|----------------------------|
| a) Two  | b) Three                   |
| c) Four | d) It does not have phases |
- 10)** The-Driven Development (TDD) required a developer to write the test cases before writing the actual production code.
- |         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|

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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
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Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
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3) Assume data wherever necessary.

**Q.2 Attempt any Four.** **20**

- a) What is Agile Manifesto? Describe in short, Agile manifesto principles?
- b) What is Feature Drive development? What are the Goals of it?
- c) What is product backlog? Describe features of product backlog.
- d) What do you understand by Test-Driven Development (TDD)? What are the tools used for Test-Driven Development in agile?
- e) How the dependency inversion principle is used in agile design methodology?

**Q.3 Attempt any two.** **20**

- a) What are the key responsibilities of a Scrum Master in a Scrum project?  
Who does the Scrum Master report? Explain any one Scrum case study.
- b) What are the characteristics and content of user stories? Describe in detail how do you write acceptance criteria for user stories in Agile?
- c) What is ALM? Why is ALM so important? Explain ALM with example from industry?

<b>Seat No.</b>	
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- 9)** Which Agile methodology advocates the use of problem domain?
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  - c) Scrum
  - d) Evo
- 10)** Scrum Teams are
- a) Self organizing, cross functional
  - b) Cross productive, self organizing
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Seat No.	
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Set R
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**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
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**Agile Project Management**

Day & Date: Friday, 24-02-2023  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10**

- 1) How many phases are there in Scrum?
  - a) Two
  - b) Three
  - c) Four
  - d) It does not have phases
- 2) The-Driven Development (TDD) required a developer to write the test cases before writing the actual production code.
  - a) True
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- 3) Select the option that suits the Manifesto for Agile Software Development
  - a) Individuals and interactions
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- 4) Agile Software Development is based on
  - a) Incremental Development
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- 9) Amongst which of the following is/are the type of agile methodologies.
  - a) Scrum
  - b) FDD
  - c) DSDM
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- 10) Which of the following option is used to measure the size of a user story for an agile Project?
  - a) Story points
  - b) Functional point
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  - d) Work breakdown point

<b>Seat No.</b>	
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**Set R**

**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10**

- 1) When forming an Agile project team it is BEST to use
  - a) Generalized specialists
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  - c) Highly specialized developers
  - d) All of the above
- 2) Which Agile methodology advocates the use of problem domain?
  - a) Extreme programming (XP)
  - b) Future Driven Development (FDD)
  - c) Scrum
  - d) Evo
- 3) Scrum Teams are
  - a) Self organizing, cross functional
  - b) Cross productive, self organizing
  - c) Self-destructive, self-motivating
  - d) Non-productive, Selfish
- 4) Agile software engineering demonstrated to deliver successful systems quickly.
  - a) True
  - b) False
- 5) Amongst which of the following is/are the type of agile methodologies.
  - a) Scrum
  - b) FDD
  - c) DSDM
  - d) All of these
- 6) Which of the following option is used to measure the size of a user story for an agile Project?
  - a) Story points
  - b) Functional point
  - c) Velocity point
  - d) Work breakdown point
- 7) How many phases are there in Scrum?
  - a) Two
  - b) Three
  - c) Four
  - d) It does not have phases

- 8)** The-Driven Development (TDD) required a developer to write the test cases before writing the actual production code.

  - a) True
  - b) False
- 9)** Select the option that suits the Manifesto for Agile Software Development

  - a) Individuals and interactions
  - b) Working software
  - c) Customer collaboration
  - d) All of the mentioned
- 10)** Agile Software Development is based on

  - a) Incremental Development
  - b) Iterative Development
  - c) Linear Development
  - d) Both incremental and iterative Development

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**Set S**

**T.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Agile Project Management**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume data wherever necessary.

**Q.2 Attempt any Four. 20**

- a) What is Agile Manifesto? Describe in short, Agile manifesto principles?
- b) What is Feature Drive development? What are the Goals of it?
- c) What is product backlog? Describe features of product backlog.
- d) What do you understand by Test-Driven Development (TDD)? What are the tools used for Test-Driven Development in agile?
- e) How the dependency inversion principle is used in agile design methodology?

**Q.3 Attempt any two. 20**

- a) What are the key responsibilities of a Scrum Master in a Scrum project? Who does the Scrum Master report? Explain any one Scrum case study.
- b) What are the characteristics and content of user stories? Describe in detail how do you write acceptance criteria for user stories in Agile?
- c) What is ALM? Why is ALM so important? Explain ALM with example from industry?

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Set	P
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Assume suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.** **14**

- 1) What can be major issue in Leave-One-Out-Cross-Validation (LOOCV)?
  - a) high variance
  - b) low variance
  - c) faster runtime compared to K-fold cross
  - d) slower runtime compared to normal validation
- 2) A measurable property or parameter of the data-set is \_\_\_\_\_.
  - a) training data
  - b) test data
  - c) feature
  - d) validation data
- 3) In regression analysis, the variable that is being predicted is;
  - a) the independent variable
  - b) the dependent variable
  - c) usually denoted by x
  - d) usually denoted by r
- 4) If the slope of the regression equation  $y = mx + c$  is positive, then;
  - a) as x increases y decreases
  - b) as x increases so does y
  - c) either a or b is correct
  - d) As x decreases y increases
- 5) Averaging the output of multiple decision trees helps \_\_\_\_\_.
  - a) Increase bias
  - b) Decrease bias
  - c) Increase variance
  - d) Decrease variance
- 6) Which of the following algorithm is not an example of an ensemble method?
  - a) Averaging Model
  - b) Random Forest
  - c) Stacking Model
  - d) Decision Tree
- 7) What is true about an ensembled classifier?
  - 1) Classifiers that are "surer" can vote with more conviction
  - 2) Classifiers as be "surer" about a particular part of the space
  - 3) Most of the times, it performs better than a single classifier
  - a) 1 and 2
  - b) 1 and 3
  - c) 2 and 3
  - d) All of the above



- 8) Which of the following are advantages of stacking model?
- a) More robust model
  - b) Better prediction
  - c) Lower time of execution
  - a) 1 and 2
  - b) 1 and 3
  - c) 2 and 3
  - d) All of the above
- 9) How do you handle missing or corrupted data in a dataset?
- a) Drop missing row or columns
  - b) Replace missing values with mean/median/mode
  - c) Assign a unique category to missing values
  - d) All of these
- 10) Which among the below options are types of Feature engineering? (May choose multiple answers)
- a) Replace missing values
  - b) Getting mean value from a group of entities
  - c) Extracting city from home address
  - d) Changing Hyperparameter values
- 11) What is Overfitting?
- a) When a predictive model is accurate but takes too long to run
  - b) When the model learns specifics of the training data that can't be Generalized to a larger data set
  - c) When you perform hyperparameter tuning and performance degrades
  - d) When you apply a powerful deep learning algorithm to a simple machine learning problem
- 12) Artificial Intelligence is the process that allows computers to learn and make decisions like Humans.
- a) True
  - b) False
- 13) Fraud Detection, Image Classification, Diagnostic and Customer Retention are applications in \_\_\_\_.
- a) Unsupervised Learning: Clustering
  - b) Supervised Learning: Classification
  - c) Reinforcement Learning
  - d) Unsupervised Learning: Regression
- 14) How do you choose the root node while constructing a Decision Tree?
- a) An attribute having high Entropy
  - b) An attribute having high Entropy and Information gain
  - c) An attribute having largest Information gain
  - d) None of the mentioned

Seat No.	
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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
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**Section – I**

- Q.2 Attempt any four** **16**
- What are the different types of Machine Learning?
  - What is the difference between Gini Impurity and Entropy in a Decision Tree?
  - What is bagging in Machine Learning?
  - How do you Determining the Best Learning Model?
  - Describing the Use of Statistics in machine learning.
- Q.3** **12**
- How Naive Bayes Algorithm Works? Explain with example.
  - How Machine Learning Can Help on the Business Problem, Explain with example.

**Section – II**

- Q.4 Answer the following questions. (Any Four)** **12**
- How dose cross-validation works in machine learning?
  - What is model stacking in machine learning? What are the main purposes of stacking?
  - What is the best way of avoiding bias in machine learning? Explain.
  - What is the use of learning curves in machine learning? Explain with example.
  - What is Hyper parameter? How do you search for the best hyper parameter?
- Q.5 Answer the following (Any One)** **06**
- Describe in detail Testing Multiple Models in Machine Learning.
  - What is Average and stacking model explain each with example.

**Q.6 Solve the following.**

For Bayesian algorithm, Using following Dataset. Calculate the posterior probability for each class. What is the outcome of prediction?

Outlook	Temp	Humidity	Windy	Play Golf
Rainy	Hot	High	False	No
Rainy	Hot	High	True	No
Overcast	Hot	High	False	Yes
Sunny	Mild	High	False	Yes
Sunny	Cool	Normal	False	Yes
Sunny	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Rainy	Mild	High	False	No
Rainy	Cool	Normal	False	Yes
Sunny	Mild	Normal	False	Yes
Rainy	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Sunny	Mild	High	True	No

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
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 3) Assume suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which of the following are advantages of stacking model?
  - a) More robust model
  - b) Better prediction
  - c) Lower time of execution
  - a) 1 and 2
  - b) 1 and 3
  - c) 2 and 3
  - d) All of the above
- 2) How do you handle missing or corrupted data in a dataset?
  - a) Drop missing row or columns
  - b) Replace missing values with mean/median/mode
  - c) Assign a unique category to missing values
  - d) All of these
- 3) Which among the below options are types of Feature engineering? (May choose multiple answers)
  - a) Replace missing values
  - b) Getting mean value from a group of entities
  - c) Extracting city from home address
  - d) Changing Hyperparameter values
- 4) What is Overfitting?
  - a) When a predictive model is accurate but takes too long to run
  - b) When the model learns specifics of the training data that can't be Generalized to a larger data set
  - c) When you perform hyperparameter tuning and performance degrades
  - d) When you apply a powerful deep learning algorithm to a simple machine learning problem
- 5) Artificial Intelligence is the process that allows computers to learn and make decisions like Humans.
  - a) True
  - b) False

- 6) Fraud Detection, Image Classification, Diagnostic and Customer Retention are applications in \_\_\_\_\_.  
a) Unsupervised Learning: Clustering  
b) Supervised Learning: Classification  
c) Reinforcement Learning  
d) Unsupervised Learning: Regression
- 7) How do you choose the root node while constructing a Decision Tree?  
a) An attribute having high Entropy  
b) An attribute having high Entropy and Information gain  
c) An attribute having largest Information gain  
d) None of the mentioned
- 8) What can be a major issue in Leave-One-Out-Cross-Validation (LOOCV)?  
a) high variance  
b) low variance  
c) faster runtime compared to K-fold cross  
d) slower runtime compared to normal validation
- 9) A measurable property or parameter of the data-set is \_\_\_\_\_.  
a) training data  
b) test data  
c) feature  
d) validation data
- 10) In regression analysis, the variable that is being predicted is;  
a) the independent variable  
b) the dependent variable  
c) usually denoted by  $x$   
d) usually denoted by  $r$
- 11) If the slope of the regression equation  $y = mx + c$  is positive, then;  
a) as  $x$  increases  $y$  decreases  
b) as  $x$  increases so does  $y$   
c) either a or b is correct  
d) As  $x$  decreases  $y$  increases
- 12) Averaging the output of multiple decision trees helps \_\_\_\_\_.  
a) Increase bias  
b) Decrease bias  
c) Increase variance  
d) Decrease variance
- 13) Which of the following algorithm is not an example of an ensemble method?  
a) Averaging Model  
b) Random Forest  
c) Stacking Model  
d) Decision Tree
- 14) What is true about an ensemble classifier?  
1) Classifiers that are "surer" can vote with more conviction  
2) Classifiers can be "surer" about a particular part of the space  
3) Most of the times, it performs better than a single classifier  
a) 1 and 2  
b) 1 and 3  
c) 2 and 3  
d) All of the above

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
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**Section – I**

- Q.2 Attempt any four** **16**
- a) What are the different types of Machine Learning?
  - b) What is the difference between Gini Impurity and Entropy in a Decision Tree?
  - c) What is bagging in Machine Learning?
  - d) How do you Determine the Best Learning Model?
  - e) Describing the Use of Statistics in machine learning.
- Q.3** **12**
- a) How Naive Bayes Algorithm Works? Explain with example.
  - b) How Machine Learning Can Help on the Business Problem, Explain with example.

**Section – II**

- Q.4 Answer the following questions. (Any Four)** **12**
- a) How does cross-validation work in machine learning?
  - b) What is model stacking in machine learning? What are the main purposes of stacking?
  - c) What is the best way of avoiding bias in machine learning? Explain.
  - d) What is the use of learning curves in machine learning? Explain with example.
  - e) What is Hyper parameter? How do you search for the best hyper parameter?
- Q.5 Answer the following (Any One)** **06**
- a) Describe in detail Testing Multiple Models in Machine Learning.
  - b) What is Average and stacking model explain each with example.

**Q.6 Solve the following.**

For Bayesian algorithm, Using following Dataset. Calculate the posterior probability for each class. What is the outcome of prediction?

Outlook	Temp	Humidity	Windy	Play Golf
Rainy	Hot	High	False	No
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Sunny	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Rainy	Mild	High	False	No
Rainy	Cool	Normal	False	Yes
Sunny	Mild	Normal	False	Yes
Rainy	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Sunny	Mild	High	True	No

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
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3) Assume suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What is Overfitting?
  - a) When a predictive model is accurate but takes too long to run
  - b) When the model learns specifics of the training data that can't be Generalized to a larger data set
  - c) When you perform hyperparameter tuning and performance degrades
  - d) When you apply a powerful deep learning algorithm to a simple machine learning problem
- 2) Artificial Intelligence is the process that allows computers to learn and make decisions like Humans.
  - a) True
  - b) False
- 3) Fraud Detection, Image Classification, Diagnostic and Customer Retention are applications in \_\_\_\_\_.
  - a) Unsupervised Learning: Clustering
  - b) Supervised Learning: Classification
  - c) Reinforcement Learning
  - d) Unsupervised Learning: Regression
- 4) How do you choose the root node while constructing a Decision Tree?
  - a) An attribute having high Entropy
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  - d) None of the mentioned
- 5) What can be major issue in Leave-One-Out-Cross-Validation (LOOCV)?
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  - b) low variance
  - c) faster runtime compared to K-fold cross
  - d) slower runtime compared to normal validation
- 6) A measurable property or parameter of the data-set is \_\_\_\_\_.
  - a) training data
  - b) test data
  - c) feature
  - d) validation data



- 7) In regression analysis, the variable that is being predicted is;  
a) the independent variable                      b) the dependent variable  
c) usually denoted by x                              d) usually denoted by r
- 8) If the slope of the regression equation  $y = mx + c$  is positive, then;  
a) as x increases y decreases                      b) as x increases so does y  
c) either a or b is correct                              d) As x decreases y increases
- 9) Averaging the output of multiple decision trees helps \_\_\_\_\_.  
a) Increase bias    b) Decrease bias  
c) Increase variance    d) Decrease variance
- 10) Which of the following algorithm is not an example of an ensemble method?  
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c) Stacking Model    d) Decision Tree
- 11) What is true about an ensembled classifier?  
1) Classifiers that are "surer" can vote with more conviction  
2) Classifiers as be "surer" about a particular part of the space  
3) Most of the times, it performs better than a single classifier  
a) 1 and 2    b) 1 and 3  
c) 2 and 3    d) All of the above
- 12) Which of the following are advantages of stacking model?  
a) More robust model  
b) Better prediction  
c) Lower time of execution  
a) 1 and 2    b) 1 and 3  
c) 2 and 3    d) All of the above
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a) Drop missing row or columns  
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- 14) Which among the below options are types of Feature engineering? (May choose multiple answers)  
a) Replace missing values  
b) Getting mean value from a group of entities  
c) Extracting city from home address  
d) Changing Hyperparameter values

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any four** **16**
- What are the different types of Machine Learning?
  - What is the difference between Gini Impurity and Entropy in a Decision Tree?
  - What is bagging in Machine Learning?
  - How do you Determine the Best Learning Model?
  - Describe the Use of Statistics in machine learning.
- Q.3** **12**
- How Naive Bayes Algorithm Works? Explain with example.
  - How Machine Learning Can Help on the Business Problem, Explain with example.

**Section – II**

- Q.4 Answer the following questions. (Any Four)** **12**
- How does cross-validation work in machine learning?
  - What is model stacking in machine learning? What are the main purposes of stacking?
  - What is the best way of avoiding bias in machine learning? Explain.
  - What is the use of learning curves in machine learning? Explain with example.
  - What is Hyper parameter? How do you search for the best hyper parameter?
- Q.5 Answer the following (Any One)** **06**
- Describe in detail Testing Multiple Models in Machine Learning.
  - What is Average and stacking model explain each with example.

**Q.6 Solve the following.**

For Bayesian algorithm, Using following Dataset. Calculate the posterior probability for each class. What is the outcome of prediction?

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Rainy	Cool	Normal	False	Yes
Sunny	Mild	Normal	False	Yes
Rainy	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Sunny	Mild	High	True	No

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

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  - d) Decision Tree
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  - 3) Most of the times, it performs better than a single classifier
  - a) 1 and 2
  - b) 1 and 3
  - c) 2 and 3
  - d) All of the above
- 3) Which of the following are advantages of stacking model?
  - a) More robust model
  - b) Better prediction
  - c) Lower time of execution
  - a) 1 and 2
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  - d) All of the above
- 4) How do you handle missing or corrupted data in a dataset?
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- 6) What is Overfitting?
- a) When a predictive model is accurate but takes too long to run
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  - d) When you apply a powerful deep learning algorithm to a simple machine learning problem
- 7) Artificial Intelligence is the process that allows computers to learn and make decisions like Humans.
- a) True
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- a) high variance
  - b) low variance
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  - b) as x increases so does y
  - c) either a or b is correct
  - d) As x decreases y increases
- 14) Averaging the output of multiple decision trees helps \_\_\_\_.
- a) Increase bias
  - b) Decrease bias
  - c) Increase variance
  - d) Decrease variance

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any four** **16**
- a) What are the different types of Machine Learning?
  - b) What is the difference between Gini Impurity and Entropy in a Decision Tree?
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  - d) How do you Determining the Best Learning Model?
  - e) Describing the Use of Statistics in machine learning.
- Q.3** **12**
- a) How Naive Bayes Algorithm Works? Explain with example.
  - b) How Machine Learning Can Help on the Business Problem, Explain with example.

**Section – II**

- Q.4 Answer the following questions. (Any Four)** **12**
- a) How dose cross-validation works in machine learning?
  - b) What is model stacking in machine learning? What are the main purposes of stacking?
  - c) What is the best way of avoiding bias in machine learning? Explain.
  - d) What is the use of learning curves in machine learning? Explain with example.
  - e) What is Hyper parameter? How do you search for the best hyper parameter?
- Q.5 Answer the following (Any One)** **06**
- a) Describe in detail Testing Multiple Models in Machine Learning.
  - b) What is Average and stacking model explain each with example.

**Q.6 Solve the following.**

For Bayesian algorithm, Using following Dataset. Calculate the posterior probability for each class. What is the outcome of prediction?

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Sunny	Mild	High	False	Yes
Sunny	Cool	Normal	False	Yes
Sunny	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Rainy	Mild	High	False	No
Rainy	Cool	Normal	False	Yes
Sunny	Mild	Normal	False	Yes
Rainy	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Sunny	Mild	High	True	No

Seat No.	
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Set	P
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Advanced Database System**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following task is performed by Transaction Coordinator in distributed database?
  - a) Starts execution of transactions
  - b) Break transaction into number of sub transactions
  - c) Coordinates termination of transaction
  - d) All of the above
- 2) Some of the attributes and records of the relation are stored in different tables at different sites is termed as \_\_\_\_\_.
  - a) Horizontal fragmentation
  - b) Replication
  - c) Vertical fragmentation
  - d) Mixed fragmentation
- 3) Which of the following is true concerning global transaction?
  - a) The required data are at one local site and the distributed DBMS routes requests as necessary
  - b) The required data are located in at least one nonlocal site and the distributed DBMS routes requests as necessary.
  - c) The required data are at one local site and the distributed DBMS passes the request to only the local DBMS.
  - d) The required data are located in at least one nonlocal site and the distributed DBMS passes the request to only the local DBMS.
- 4) All groupings of {(pid,locid,timeid), (pid,locid), (locid,timeid), (pid,timeid), (pid), (locid), (timeid), () } in one query can be achieved by using which of the following?
  - a) group by
  - b) rollup
  - c) cube
  - d) slice
- 5) Decision support system is used in making \_\_\_\_\_.
  - a) Transaction decisions
  - b) query decisions
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  - d) Table Decisions



- 6) Hadoop is a framework that works with a variety of related tools. Common cohorts include: \_\_\_\_\_.  
 a) MapReduce, Hive and HBase  
 b) MapReduce, MySQL and Google Apps  
 c) MapReduce, Hummer and Iguana  
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- 7) Following two queries are executed in parallel.  
 Select \* from department  
 Select dept\_id , count(student\_id) from admission group by dept\_id  
 This is example of \_\_\_\_\_.  
 a) Interquery  
 b) Intraoperation  
 c) Interoperation  
 d) None of these
- 8) With n relations, there are \_\_\_\_\_ different join orderings.  
 a) n  
 b)  $n^2$   
 c)  $(2*(n-1))/n!$   
 d)  $(2*(n-1))/(n-1)!$
- 9) A miner is \_\_\_\_\_.  
 a) cryptographic algorithm  
 b) A secured distributed ledger  
 c) A person doing calculation  
 d) Computers that validate and process blockchain transactions
- 10) Which of the following is true equivalence?  
 a)  $\sigma_{\theta_1 \wedge \theta_2}(E) = \sigma_{\theta_1}(\sigma_{\theta_2}(E))$   
 b)  $\sigma_{\theta_1}(\sigma_{\theta_2}(E) = \sigma_{\theta_2}(\sigma_{\theta_1}(E))$   
 c)  $E_1 X_{\theta} E_2 = E_2 X_{\theta} E_1$   
 d) All of the above
- 11) In blockchain, \_\_\_\_\_ tree stores all transactions in a block by producing a digital fingerprint of entire set of transactions.  
 a) Binary  
 b) Merkel  
 c) AVL  
 d) Red Black
- 12) Which of the following is not a blockchain component?  
 a) Ledger  
 b) Wallet  
 c) Certificate authority  
 d) Hash
- 13) What is the genesis block?  
 a) Any block created by the founder  
 b) The last block created in the Blockchain  
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 d) The first transaction in each block
- 14) A collection and a document in MongoDB are equivalent to \_\_\_\_\_ concepts respectively.  
 a) Table and Row  
 b) Table and Column  
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Seat No.	
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Set	P
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Advanced Database System**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Both Sections are compulsory.  
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**Section – I**

**Q.2 Attempt any three.**

**12**

- Explain various processes in transaction-server system.
- Explain pipelined parallelism and independent parallelism.
- A database table T1 has 2000 records and occupies 80 disk blocks. Another table T2 has 400 records and occupies 20 disk blocks. If Nested-loop join algorithm is employed to perform the join, with the most appropriate choice of table to be used in outer loop, how many numbers of block accesses and seek operation required for performing join operation?
- How to estimate the size of the results of a join operation?

**Q.3 Attempt any one.**

**08**

- Explain external sort-merge algorithm and show stepwise result for the following relation using external merge sort to sort relation on name.

b. Name	c. Score
d. G	e. 24
f. A	g. 19
h. D	i. 31
j. C	k. 33
l. B	m. 14
n. E	o. 16
p. R	q. 16
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t. M	u. 3
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x. D	y. 7
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- How new coordinator is selected in distributed database in case of coordinator failure.

- Q.4** Explain various partitioning techniques in parallel database. Show stepwise result for join operation of following two tables using asymmetric fragment and join if two processors are available. **08**

product_name	product_id
orange juice	101
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product_id	quantity
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107	35

### Section – II

- Q.5 Attempt any three.**

**12**

- Explain Collaborative filtering with example.
- Define bigdata and explain various properties of bigdata.
- Explain types of blockchain technology with advantages and disadvantages.
- Explain different types of nodes and their functions in Hadoop.

- Q.6 Attempt any one.**

**08**

- Explain various components of a blockchain architecture and any one consensus algorithm.
- Consider the below table and find result for following queries.
  - Select item\_id, colour, size, count(\*) from r group by rollup (item\_id, colour, size)
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Skirt	Pastel	Medium	9
Skirt	Pastel	Large	15
Skirt	White	Small	2
Skirt	White	Medium	5
Skirt	White	Large	3
Dress	dark	Small	2
Dress	dark	Medium	6
Dress	dark	Large	12
Dress	Pastel	Small	4
Dress	Pastel	Medium	3
Dress	Pastel	Large	3
Dress	White	Small	2
Dress	White	Medium	0
Dress	White	Large	2
Shirt	dark	Small	6
Shirt	dark	Medium	6

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Shirt	Pastel	Small	1
Shirt	Pastel	Medium	2
Shirt	Pastel	Large	17
Shirt	White	Small	1
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**Q.7** Find frequent itemsets and association rules for following dataset given support = 50% and confidence = 60%. **08**

Transaction	List of items
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T2	I2, I3, I4
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Set Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Advanced Database System**

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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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Seat No.	
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Set Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
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**Advanced Database System**

Day & Date: Tuesday, 31-01-2023  
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Max. Marks: 56

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**Section – I**

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- How new coordinator is selected in distributed database in case of coordinator failure.

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chocolate	107

product_id	quantity
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105	13
107	35

### Section – II

- Q.5 Attempt any three.**

**12**

- Explain Collaborative filtering with example.
- Define bigdata and explain various properties of bigdata.
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Dress	Pastel	Large	3
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Dress	White	Large	2
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Advanced Database System**

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.** **14**

- 1) In blockchain, \_\_\_\_\_ tree stores all transactions in a block by producing a digital fingerprint of entire set of transactions.
 

a) Binary	b) Merkel
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- 4) A collection and a document in MongoDB are equivalent to \_\_\_\_\_ concepts respectively.
 

a) Table and Row	b) Table and Column
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- 5) Which of the following task is performed by Transaction Coordinator in distributed database?
 

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- 6) Some of the attributes and records of the relation are stored in different tables at different sites is termed as \_\_\_\_\_.
 

a) Horizontal fragmentation	b) Replication
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Set	R
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
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**Advanced Database System**

Day & Date: Tuesday, 31-01-2023  
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Max. Marks: 56

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**Section – I**

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- Explain various processes in transaction-server system.
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### Section – II

- Q.5 Attempt any three.**

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- Explain Collaborative filtering with example.
- Define bigdata and explain various properties of bigdata.
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Seat No.	
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Set	S
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Duration: 30 Minutes

Marks: 14

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- 6) In blockchain, \_\_\_\_\_ tree stores all transactions in a block by producing a digital fingerprint of entire set of transactions.  
 a) Binary  
 b) Merkel  
 c) AVL  
 d) Red Black
- 7) Which of the following is not a blockchain component?  
 a) Ledger  
 b) Wallet  
 c) Certificate authority  
 d) Hash

- 8) What is the genesis block?
- a) Any block created by the founder
  - b) The last block created in the Blockchain
  - c) The first block of a Blockchain
  - d) The first transaction in each block
- 9) A collection and a document in MongoDB are equivalent to \_\_\_\_\_ concepts respectively.
- a) Table and Row
  - b) Table and Column
  - c) Column and Row
  - d) Database and Table
- 10) Which of the following task is performed by Transaction Coordinator in distributed database?
- a) Starts execution of transactions
  - b) Break transaction into number of sub transactions
  - c) Coordinates termination of transaction
  - d) All of the above
- 11) Some of the attributes and records of the relation are stored in different tables at different sites is termed as \_\_\_\_\_.
- a) Horizontal fragmentation
  - b) Replication
  - c) Vertical fragmentation
  - d) Mixed fragmentation
- 12) Which of the following is true concerning global transaction?
- a) The required data are at one local site and the distributed DBMS routes requests as necessary
  - b) The required data are located in at least one nonlocal site and the distributed DBMS routes requests as necessary.
  - c) The required data are at one local site and the distributed DBMS passes the request to only the local DBMS.
  - d) The required data are located in at least one nonlocal site and the distributed DBMS passes the request to only the local DBMS.
- 13) All groupings of {(pid,locid,timeid), (pid,locid), (locid,timeid), (pid,timeid), (pid), (locid), (timeid), () } in one query can be achieved by using which of the following?
- a) group by
  - b) rollup
  - c) cube
  - d) slice
- 14) Decision support system is used in making \_\_\_\_\_.
- a) Transaction decisions
  - b) query decisions
  - c) Business Decisions
  - d) Table Decisions



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Advanced Database System**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Both Sections are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.**

**12**

- Explain various processes in transaction-server system.
- Explain pipelined parallelism and independent parallelism.
- A database table T1 has 2000 records and occupies 80 disk blocks. Another table T2 has 400 records and occupies 20 disk blocks. If Nested-loop join algorithm is employed to perform the join, with the most appropriate choice of table to be used in outer loop, how many numbers of block accesses and seek operation required for performing join operation?
- How to estimate the size of the results of a join operation?

**Q.3 Attempt any one.**

**08**

- Explain external sort-merge algorithm and show stepwise result for the following relation using external merge sort to sort relation on name.

b. Name	c. Score
d. G	e. 24
f. A	g. 19
h. D	i. 31
j. C	k. 33
l. B	m. 14
n. E	o. 16
p. R	q. 16
r. D	s. 21
t. M	u. 3
v. P	w. 2
x. D	y. 7
z. A	aa. 14

- How new coordinator is selected in distributed database in case of coordinator failure.

- Q.4** Explain various partitioning techniques in parallel database. Show stepwise result for join operation of following two tables using asymmetric fragment and join if two processors are available. **08**

product_name	product_id
orange juice	101
white bread	102
coffee	103
eggs	105
cereals	106
chocolate	107

product_id	quantity
100	7
102	4
104	1
105	13
107	35

### Section – II

- Q.5 Attempt any three.**

**12**

- Explain Collaborative filtering with example.
- Define bigdata and explain various properties of bigdata.
- Explain types of blockchain technology with advantages and disadvantages.
- Explain different types of nodes and their functions in Hadoop.

- Q.6 Attempt any one.**

**08**

- Explain various components of a blockchain architecture and any one consensus algorithm.
- Consider the below table and find result for following queries.
  - Select item\_id, colour, size, count(\*) from r group by rollup (item\_id, colour, size)
  - Select item\_id, size, count(\*) from r group by cube (item\_id, size)
  - Select colour, size, count(\*) from r group by colour, size
  - Select colour, size, count(\*) from r group by colour, size

item id	Color	Size	quantity
Skirt	dark	Small	2
Skirt	dark	Medium	5
Skirt	dark	Large	1
Skirt	Pastel	Small	11
Skirt	Pastel	Medium	9
Skirt	Pastel	Large	15
Skirt	White	Small	2
Skirt	White	Medium	5
Skirt	White	Large	3
Dress	dark	Small	2
Dress	dark	Medium	6
Dress	dark	Large	12
Dress	Pastel	Small	4
Dress	Pastel	Medium	3
Dress	Pastel	Large	3
Dress	White	Small	2
Dress	White	Medium	0
Dress	White	Large	2
Shirt	dark	Small	6
Shirt	dark	Medium	6

Shirt	dark	Large	4
Shirt	Pastel	Small	1
Shirt	Pastel	Medium	2
Shirt	Pastel	Large	17
Shirt	White	Small	1
Shirt	White	Medium	10
Shirt	White	Large	14

**Q.7** Find frequent itemsets and association rules for following dataset given support = 50% and confidence = 60%. **08**

Transaction	List of items
T1	I1, I2, I3
T2	I2, I3, I4
T3	I4, I5
T4	I1, I2, I4
T5	I1, I2, I3, I5
T6	I1, I2, I3, I4

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

- Q.1 Choose the correct alternatives from the options. 14**
- 1) Quality also can be looked at in terms of user satisfaction which includes \_\_\_\_\_.
    - a) A compliant product
    - b) Good quality output
    - c) Delivery within budget and schedule
    - d) All of these
  - 2) Which of the following is not a main phase in Configuration Management Process?
    - a) CM Planning
    - b) Executing the CM process
    - c) CM audits
    - d) None of these
  - 3) Which of the following lasts for the duration of the project and covers the development process?
    - a) Taking corrective actions when needed
    - b) Monitoring all key parameters like cost, schedule, risks
    - c) Providing information on the development process in terms of metrics
    - d) All of these
  - 4) Which is a black box testing technique appropriate to all levels of testing?
    - a) Acceptance testing
    - b) Equivalence partitioning
    - c) Regression testing
    - d) Quality assurance
  - 5) Which of the following is a common pointer problem?
    - a) Data sharing errors
    - b) Accessing data elements of the wrong type
    - c) Attempting to use memory areas after freeing them
    - d) All of these
  - 6) The architecture of object-oriented software results in a series of layered subsystems that encapsulate collaborating classes.
    - a) True
    - b) False
  - 7) Which of the following is not an example of a business process?
    - a) Testing software
    - b) Hiring an employee
    - c) Purchasing services
    - d) Designing a new product

- 8) Which of the following statements are incorrect with reference to web-based systems? Web-based systems.
- a) must be secure
  - b) must be able to cope with uncertain, random heavy demands on services
  - c) should be unscalable
  - d) are subject to assorted legal, social, and ethical scrutiny
- 9) The \_\_\_\_\_ is connected to servers [typically powerful workstations or PCs] that play a dual role.
- a) Database
  - b) Software
  - c) Hardware
  - d) None of these
- 10) An event in an executing program where the advice associated with an aspect may be executed is known as \_\_\_\_\_.
- a) aspect
  - b) pointcut
  - c) join point model
  - d) join point
- 11) Which of the following is an essential principle of an architecture?
- a) Consistency
  - b) Reliability
  - c) Scalability
  - d) All of these
- 12) Which of the following is not a dimension of scalability?
- a) Interception
  - b) Distribution
  - c) Manageability
  - d) Size
- 13) Which architecture is used when there is a high volume of transactions to be processed by the server?
- a) Master-Slave architecture
  - b) Multi-tier client-server architecture
  - c) Distributed component architecture
  - d) Peer-to-peer architecture
- 14) Which of the following term is best defined by the statement: "The names of the operations in the 'provides' and 'requires' interfaces are different."?
- a) Operation incompatibility
  - b) Operation incompleteness
  - c) Parameter incompatibility
  - d) None of these

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) Illustrate with example the various skills required by Tester.
- b) List and justify the challenges in testing, also extend the challenges in defect classification.
- c) Identify and explain the testing process with attitude towards testing with example.
- d) Illustrate in detail all the white box testing techniques.

**Q.3 Attempt any one.** **08**

- a) State and explain all the challenges of testing also explain test team approach.

**OR**

- b) Extend with example module, integration and system testing with example.

**Q.4 Write a note on.** **08**

- a) Defect life cycle and defect management Process
- b) Big-Bang and Sandwich testing

**Section – II**

**Q.5 Solve any three.** **12**

- a) What is data flow testing? Illustrate the feasible paths and test selection criteria in data flow testing.
- b) Extend with example the statistical of test case organization and tracking.
- c) State and outline the benefits of automation and tools.
- d) What is open source testing tools, justify with example?

**Q.6 What are the essential items a system test plan should include extend in detail with example?** **08**

**OR**

Explain with example elements of software quality assurance, process and products and reliability.

**Q.7 Write note on.** **08**

- a) Software quality plan
- b) Differentiate between failure, error and fault

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following statements are incorrect with reference to web-based systems? Web-based systems.
  - a) must be secure
  - b) must be able to cope with uncertain, random heavy demands on services
  - c) should be unscalable
  - d) are subject to assorted legal, social, and ethical scrutiny
- 2) The \_\_\_\_\_ is connected to servers [typically powerful workstations or PCs] that play a dual role.
  - a) Database
  - b) Software
  - c) Hardware
  - d) None of these
- 3) An event in an executing program where the advice associated with an aspect may be executed is known as \_\_\_\_\_.
  - a) aspect
  - b) pointcut
  - c) join point model
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  - b) Operation incompleteness
  - c) Parameter incompatibility
  - d) None of these

- 8) Quality also can be looked at in terms of user satisfaction which includes \_\_\_\_\_.  
a) A compliant product  
b) Good quality output  
c) Delivery within budget and schedule  
d) All of these
- 9) Which of the following is not a main phase in Configuration Management Process?  
a) CM Planning  
b) Executing the CM process  
c) CM audits  
d) None of these
- 10) Which of the following lasts for the duration of the project and covers the development process?  
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c) Regression testing  
d) Quality assurance
- 12) Which of the following is a common pointer problem?  
a) Data sharing errors  
b) Accessing data elements of the wrong type  
c) Attempting to use memory areas after freeing them  
d) All of these
- 13) The architecture of object-oriented software results in a series of layered subsystems that encapsulate collaborating classes.  
a) True  
b) False
- 14) Which of the following is not an example of a business process?  
a) Testing software  
b) Hiring an employee  
c) Purchasing services  
d) Designing a new product



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) Illustrate with example the various skills required by Tester.
- b) List and justify the challenges in testing, also extend the challenges in defect classification.
- c) Identify and explain the testing process with attitude towards testing with example.
- d) Illustrate in detail all the white box testing techniques.

**Q.3 Attempt any one.** **08**

- a) State and explain all the challenges of testing also explain test team approach.

**OR**

- b) Extend with example module, integration and system testing with example.

**Q.4 Write a note on.** **08**

- a) Defect life cycle and defect management Process
- b) Big-Bang and Sandwich testing

**Section – II**

**Q.5 Solve any three.** **12**

- a) What is data flow testing? Illustrate the feasible paths and test selection criteria in data flow testing.
- b) Extend with example the statistical of test case organization and tracking.
- c) State and outline the benefits of automation and tools.
- d) What is open source testing tools, justify with example?

**Q.6 What are the essential items a system test plan should include extend in detail with example?** **08**

**OR**

Explain with example elements of software quality assurance, process and products and reliability.

**Q.7 Write note on.** **08**

- a) Software quality plan
- b) Differentiate between failure, error and fault

<b>Seat No.</b>	
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- 8) Which is a black box testing technique appropriate to all levels of testing?
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- a) Database
  - b) Software
  - c) Hardware
  - d) None of these
- 14) An event in an executing program where the advice associated with an aspect may be executed is known as \_\_\_\_\_.
- a) aspect
  - b) pointcut
  - c) join point model
  - d) join point

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) Illustrate with example the various skills required by Tester.
- b) List and justify the challenges in testing, also extend the challenges in defect classification.
- c) Identify and explain the testing process with attitude towards testing with example.
- d) Illustrate in detail all the white box testing techniques.

**Q.3 Attempt any one.** **08**

- a) State and explain all the challenges of testing also explain test team approach.

**OR**

- b) Extend with example module, integration and system testing with example.

**Q.4 Write a note on.** **08**

- a) Defect life cycle and defect management Process
- b) Big-Bang and Sandwich testing

**Section – II**

**Q.5 Solve any three.** **12**

- a) What is data flow testing? Illustrate the feasible paths and test selection criteria in data flow testing.
- b) Extend with example the statistical of test case organization and tracking.
- c) State and outline the benefits of automation and tools.
- d) What is open source testing tools, justify with example?

**Q.6** What are the essential items a system test plan should include extend in detail with example? **08**

**OR**

Explain with example elements of software quality assurance, process and products and reliability.

**Q.7 Write note on.** **08**

- a) Software quality plan
- b) Differentiate between failure, error and fault

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- 8) Which architecture is used when there is a high volume of transactions to be processed by the server?
- a) Master-Slave architecture
  - b) Multi-tier client-server architecture
  - c) Distributed component architecture
  - d) Peer-to-peer architecture
- 9) Which of the following term is best defined by the statement: "The names of the operations in the 'provides' and 'requires' interfaces are different."?
- a) Operation incompatibility
  - b) Operation incompleteness
  - c) Parameter incompatibility
  - d) None of these
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- a) A compliant product
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- a) Acceptance testing
  - b) Equivalence partitioning
  - c) Regression testing
  - d) Quality assurance
- 14) Which of the following is a common pointer problem?
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  - d) All of these

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Software Testing and Quality Assurance**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) Illustrate with example the various skills required by Tester.
- b) List and justify the challenges in testing, also extend the challenges in defect classification.
- c) Identify and explain the testing process with attitude towards testing with example.
- d) Illustrate in detail all the white box testing techniques.

**Q.3 Attempt any one.** **08**

- a) State and explain all the challenges of testing also explain test team approach.

**OR**

- b) Extend with example module, integration and system testing with example.

**Q.4 Write a note on.** **08**

- a) Defect life cycle and defect management Process
- b) Big-Bang and Sandwich testing

**Section – II**

**Q.5 Solve any three.** **12**

- a) What is data flow testing? Illustrate the feasible paths and test selection criteria in data flow testing.
- b) Extend with example the statistical of test case organization and tracking.
- c) State and outline the benefits of automation and tools.
- d) What is open source testing tools, justify with example?

**Q.6 What are the essential items a system test plan should include extend in detail with example?** **08**

**OR**

Explain with example elements of software quality assurance, process and products and reliability.

**Q.7 Write note on.** **08**

- a) Software quality plan
- b) Differentiate between failure, error and fault

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Distributed Systems**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**
- a) What is a distributed operating system? State and explore reasons of its popularity.
  - b) List & elaborate all the distributed systems models.
  - c) Extend with figure all the communication protocols for RPC.
  - d) Illustrate with diagram the client server binding in detail.
- Q.3** **08**
- a) Explain all the mechanisms for process migration
- OR**
- b) Illustrate with example event ordering and election algorithm for synchronization.
- Q.4 Attempt any two.** **08**
- a) Failure handling for MPS
  - b) Clock Synchronization
  - c) The RPC Model

**Section – II**

- Q.5 Attempt any three.** **12**
- a) Extend all the non-token based mutual algorithms with example.
  - b) Illustrate the issues in deadlock detection and resolution.
  - c) Explain the concept and architecture of distributed file system.
  - d) List and explain the memory coherence protocols.
- Q.6** **08**
- a) Explain with example design issues of distributed file systems.
- OR**
- b) Analyze in detail the algorithm for distributed shared memory.
- Q.7 Attempt any two.** **08**
- a) Log-Structured file systems
  - b) Deadlock Avoidance and Prevention algorithms
  - c) Distributed Mutual Exclusion

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Distributed Systems**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What are the characteristics of tightly coupled system?
 

i) Different clock	ii) Use communication links
iii) Same clock	iv) Distributed systems
a) i	b) i and iv
c) i, ii and iii	d) ii, iii and iv
- 2) What is not a major reason for building distributed systems?
 

a) Resource sharing	b) Computation speedup
c) Simplicity	d) Reliability
- 3) What is not true about distributed system?
 

a) All processors are synchronized
b) It is a collection of processor
c) They do not share memory
d) None of these
- 4) What are the advantages of token ring passing approach?
 

i) One processor as coordinator which handles all requests	
ii) No starvation if the ring is unidirectional	
iii) There are many messages passed per section entered if few users want to get in section	
iv) One processor as coordinator which handles all requests	
v) Only one message/entry if everyone wants to get in	
a) i	b) i, ii and iv
c) i, ii and iii	d) ii and iii
- 5) Which one of the following hides the location where in the network the file is stored?
 

a) Spy distributed file system
b) Hidden distributed file system
c) Escaped distribution file system
d) Transparent distributed file system

- 6) Which of the following two operations are provided by the IPC facility?
- a) write & delete message
  - b) receive & send message
  - c) send & delete message
  - d) delete & receive message
- 7) In the non blocking send the sending process \_\_\_\_\_.  
a) sends the message and resumes operation  
b) keeps sending until the message is received  
c) keeps sending until it receives a message  
d) none of these
- 8) The capability of a system to adapt the increased service load is called \_\_\_\_\_.  
a) Capacity  
b) Tolerance  
c) Scalability  
d) None of these
- 9) Which routing technique is used in a distributed system?  
a) fixed routing  
b) virtual routing  
c) dynamic routing  
d) All of these
- 10) If timestamps of two events are same, then the events are \_\_\_\_\_.  
a) Non-concurrent  
b) Concurrent  
c) Monotonic  
d) Non-monotonic
- 11) What are the different ways in which clients and servers are dispersed across machines?  
a) Servers may not run on dedicated machines  
b) OS cannot be distributed with the file system a part of that distribution  
c) Distribution cannot be interposed between an OS and the file system  
d) Servers and clients can be on same machines
- 12) Single coordinator approach has the following disadvantages \_\_\_\_\_.  
a) Deadlock  
b) Slow response  
c) Bottleneck  
d) One request per second
- 13) What are the characteristics of Distributed Operating system?  
a) Access is done like local resources  
b) Users are aware of multiplicity of machines  
c) They have multiple zones to access files  
d) None of these
- 14) Which are the two complementary deadlock-prevention schemes using timestamps?  
a) The wait-n-watch scheme  
b) The wait-die & wound-wait scheme  
c) The wound-wait scheme  
d) The wait-wound & wound-wait scheme

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Distributed Systems**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**
- What is a distributed operating system? State and explore reasons of its popularity.
  - List & elaborate all the distributed systems models.
  - Extend with figure all the communication protocols for RPC.
  - Illustrate with diagram the client server binding in detail.
- Q.3**
  - Explain all the mechanisms for process migration**08**
- OR**
- Illustrate with example event ordering and election algorithm for synchronization.
- Q.4 Attempt any two.** **08**
- Failure handling for MPS
  - Clock Synchronization
  - The RPC Model

**Section – II**

- Q.5 Attempt any three.** **12**
- Extend all the non-token based mutual algorithms with example.
  - Illustrate the issues in deadlock detection and resolution.
  - Explain the concept and architecture of distributed file system.
  - List and explain the memory coherence protocols.
- Q.6**
  - Explain with example design issues of distributed file systems.**08**
- OR**
- Analyze in detail the algorithm for distributed shared memory.
- Q.7 Attempt any two.** **08**
- Log-Structured file systems
  - Deadlock Avoidance and Prevention algorithms
  - Distributed Mutual Exclusion

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Distributed Systems**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What are the advantages of token ring passing approach?
  - i) One processor as coordinator which handles all requests
  - ii) No starvation if the ring is unidirectional
  - iii) There are many messages passed per section entered if few users want to get in section
  - iv) One processor as coordinator which handles all requests
  - v) Only one message/entry if everyone wants to get in
  - a) i
  - b) i, ii and iv
  - c) i, ii and iii
  - d) ii and iii
- 2) Which one of the following hides the location where in the network the file is stored?
  - a) Spy distributed file system
  - b) Hidden distributed file system
  - c) Escaped distribution file system
  - d) Transparent distributed file system
- 3) Which of the following two operations are provided by the IPC facility?
  - a) write & delete message
  - b) receive & send message
  - c) send & delete message
  - d) delete & receive message
- 4) In the non blocking send the sending process \_\_\_\_\_.
  - a) sends the message and resumes operation
  - b) keeps sending until the message is received
  - c) keeps sending until it receives a message
  - d) none of these
- 5) The capability of a system to adapt the increased service load is called \_\_\_\_\_.
  - a) Capacity
  - b) Tolerance
  - c) Scalability
  - d) None of these
- 6) Which routing technique is used in a distributed system?
  - a) fixed routing
  - b) virtual routing
  - c) dynamic routing
  - d) All of these



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Distributed Systems**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any three.** **12**
- a) What is a distributed operating system? State and explore reasons of its popularity.
  - b) List & elaborate all the distributed systems models.
  - c) Extend with figure all the communication protocols for RPC.
  - d) Illustrate with diagram the client server binding in detail.
- Q.3** a) Explain all the mechanisms for process migration **08**
- OR**
- b) Illustrate with example event ordering and election algorithm for synchronization.
- Q.4 Attempt any two.** **08**
- a) Failure handling for MPS
  - b) Clock Synchronization
  - c) The RPC Model

**Section – II**

- Q.5 Attempt any three.** **12**
- a) Extend all the non-token based mutual algorithms with example.
  - b) Illustrate the issues in deadlock detection and resolution.
  - c) Explain the concept and architecture of distributed file system.
  - d) List and explain the memory coherence protocols.
- Q.6** a) Explain with example design issues of distributed file systems. **08**
- OR**
- b) Analyze in detail the algorithm for distributed shared memory.
- Q.7 Attempt any two.** **08**
- a) Log-Structured file systems
  - b) Deadlock Avoidance and Prevention algorithms
  - c) Distributed Mutual Exclusion



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Distributed Systems**

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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) What are the characteristics of Distributed Operating system?
  - a) Access is done like local resources
  - b) Users are aware of multiplicity of machines
  - c) They have multiple zones to access files
  - d) None of these
- 2) Which are the two complementary deadlock-prevention schemes using timestamps?
  - a) The wait-n-watch scheme
  - b) The wait-die & wound-wait scheme
  - c) The wound-wait scheme
  - d) The wait-wound & wound-wait scheme
- 3) What are the characteristics of tightly coupled system?
 

i) Different clock	ii) Use communication links
iii) Same clock	iv) Distributed systems
a) i	b) i and iv
c) i, ii and iii	d) ii, iii and iv
- 4) What is not a major reason for building distributed systems?
 

a) Resource sharing	b) Computation speedup
c) Simplicity	d) Reliability
- 5) What is not true about distributed system?
  - a) All processors are synchronized
  - b) It is a collection of processor
  - c) They do not share memory
  - d) None of these



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Distributed Systems**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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3) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**
- a) What is a distributed operating system? State and explore reasons of its popularity.
  - b) List & elaborate all the distributed systems models.
  - c) Extend with figure all the communication protocols for RPC.
  - d) Illustrate with diagram the client server binding in detail.
- Q.3** **08**
- a) Explain all the mechanisms for process migration
- OR**
- b) Illustrate with example event ordering and election algorithm for synchronization.
- Q.4 Attempt any two.** **08**
- a) Failure handling for MPS
  - b) Clock Synchronization
  - c) The RPC Model

**Section – II**

- Q.5 Attempt any three.** **12**
- a) Extend all the non-token based mutual algorithms with example.
  - b) Illustrate the issues in deadlock detection and resolution.
  - c) Explain the concept and architecture of distributed file system.
  - d) List and explain the memory coherence protocols.
- Q.6** **08**
- a) Explain with example design issues of distributed file systems.
- OR**
- b) Analyze in detail the algorithm for distributed shared memory.
- Q.7 Attempt any two.** **08**
- a) Log-Structured file systems
  - b) Deadlock Avoidance and Prevention algorithms
  - c) Distributed Mutual Exclusion

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not a data mining functionality?
  - a) Characterization and Discrimination
  - b) Classification and regression
  - c) Selection and interpretation
  - d) Clustering and Analysis
- 2) \_\_\_\_\_ is a summarization of the general characteristics or features of a target class of data.
  - a) Data Characterization
  - b) Data Classification
  - c) Data discrimination
  - d) Data selection
- 3) The various aspects of data mining methodologies is/are \_\_\_\_\_.
  - i) Mining various and new kinds of knowledge
  - ii) Mining knowledge in multidimensional space
  - iii) Pattern evaluation and pattern or constraint-guided mining
  - iv) Handling uncertainty, noise, or incompleteness of data
  - a) i, ii and iv only
  - b) ii, iii and iv only
  - c) i, ii and iii only
  - d) All i, ii, iii and iv
- 4) The full form of KDD is \_\_\_\_\_.
  - a) Knowledge Database
  - b) Knowledge Discovery Database
  - c) Knowledge Data House
  - d) Knowledge Data Definition
- 5) Which of the following activities is NOT a data mining task?
  - a) Predicting the future stock price of a company using historical records
  - b) Monitoring and predicting failures in a hydropower plant
  - c) Extracting the frequencies of a sound wave
  - d) Monitoring the heart rate of a patient for abnormalities
- 6) Which of the following is not a data pre-processing methods?
  - a) Data Visualization
  - b) Data Discretization
  - c) Data Cleaning
  - d) Data Reduction



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to right indicates full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) What are major issues in data mining?
- b) What are major tasks in Data Preprocessing?
- c) What are the issues in classification? Explain with example.
- d) Explain frequent pattern mining.

**Q.3 Attempt any two.** **16**

- a) Use a flowchart to summarize the following procedures for attribute subset selection:
  - 1) stepwise forward selection
  - 2) stepwise backward elimination
  - 3) a combination of forward selection and backward elimination
- b) Give an example of classification using prediction.
- c) Explain KDD in detail.

**Section – II**

**Q.4 Attempt any three.** **12**

- a) How do you measure the quality of rules?
- b) What are advanced association rule techniques?
- c) Explain – BIRCH
- d) What is cluster analysis?

**Q.5 Attempt any two.** **16**

- a) What do you mean by partitioning?
- b) Describe web content mining.
- c) Elaborate the types of outliers. Identify an outlier using clustering-based outlier detection method with suitable example.

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- 7) This step of the KDD process model deals with noisy data \_\_\_\_\_.  
a) creating a target dataset                      b) data preprocessing  
c) data transformation                          d) data mining
- 8) Which of the following is not a data mining functionality?  
a) Characterization and Discrimination  
b) Classification and regression  
c) Selection and interpretation  
d) Clustering and Analysis
- 9) \_\_\_\_\_ is a summarization of the general characteristics or features of a target class of data.  
a) Data Characterization                      b) Data Classification  
c) Data discrimination                      d) Data selection
- 10) The various aspects of data mining methodologies is/are \_\_\_\_\_.  
i) Mining various and new kinds of knowledge  
ii) Mining knowledge in multidimensional space  
iii) Pattern evaluation and pattern or constraint-guided mining  
iv) Handling uncertainty, noise, or incompleteness of data  
a) i, ii and iv only                              b) ii, iii and iv only  
c) i, ii and iii only                              d) All i, ii, iii and iv
- 11) The full form of KDD is \_\_\_\_\_.  
a) Knowledge Database  
b) Knowledge Discovery Database  
c) Knowledge Data House  
d) Knowledge Data Definition
- 12) Which of the following activities is NOT a data mining task?  
a) Predicting the future stock price of a company using historical records  
b) Monitoring and predicting failures in a hydropower plant  
c) Extracting the frequencies of a sound wave  
d) Monitoring the heart rate of a patient for abnormalities
- 13) Which of the following is not a data pre-processing methods?  
a) Data Visualization                      b) Data Discretization  
c) Data Cleaning                          d) Data Reduction
- 14) The difference between supervised learning and unsupervised learning is given by \_\_\_\_\_.  
a) unlike unsupervised learning, supervised learning needs labeled data  
b) unlike unsupervised learning, supervised learning can be used to detect outliers  
c) there is no difference  
d) unlike supervised learning, unsupervised learning can form new classes



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Set	Q
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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to right indicates full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) What are major issues in data mining?
- b) What are major tasks in Data Preprocessing?
- c) What are the issues in classification? Explain with example.
- d) Explain frequent pattern mining.

**Q.3 Attempt any two.** **16**

- a) Use a flowchart to summarize the following procedures for attribute subset selection:
  - 1) stepwise forward selection
  - 2) stepwise backward elimination
  - 3) a combination of forward selection and backward elimination
- b) Give an example of classification using prediction.
- c) Explain KDD in detail.

**Section – II**

**Q.4 Attempt any three.** **12**

- a) How do you measure the quality of rules?
- b) What are advanced association rule techniques?
- c) Explain – BIRCH
- d) What is cluster analysis?

**Q.5 Attempt any two.** **16**

- a) What do you mean by partitioning?
- b) Describe web content mining.
- c) Elaborate the types of outliers. Identify an outlier using clustering-based outlier detection method with suitable example.

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) This clustering algorithm terminates when mean values computed for the current iteration of the algorithm are identical to the computed mean values for the previous iteration \_\_\_\_\_.  
 a) K-Means clustering                      b) conceptual clustering  
 c) expectation maximization              d) agglomerative clustering
- 2) If a customer is spending more than expected, the customer's intrinsic value is \_\_\_\_\_ their actual value.  
 a) greater than                                  b) less than  
 c) less than or equal to                      d) equal to
- 3) A data mining algorithm is unstable if \_\_\_\_\_.  
 a) test set accuracy depends on the ordering of test set instances  
 b) the algorithm builds models unable to classify outliers  
 c) the algorithm is highly sensitive to small changes in the training data  
 d) test set accuracy depends on the choice of input attributes
- 4) This step of the KDD process model deals with noisy data \_\_\_\_\_.  
 a) creating a target dataset                  b) data preprocessing  
 c) data transformation                      d) data mining
- 5) Which of the following is not a data mining functionality?  
 a) Characterization and Discrimination  
 b) Classification and regression  
 c) Selection and interpretation  
 d) Clustering and Analysis
- 6) \_\_\_\_\_ is a summarization of the general characteristics or features of a target class of data.  
 a) Data Characterization                      b) Data Classification  
 c) Data discrimination                      d) Data selection

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Data Mining**

Day & Date: Thursday, 09-02-2023  
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Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
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**Section – I**

**Q.2 Attempt any three.** **12**

- a) What are major issues in data mining?
- b) What are major tasks in Data Preprocessing?
- c) What are the issues in classification? Explain with example.
- d) Explain frequent pattern mining.

**Q.3 Attempt any two.** **16**

- a) Use a flowchart to summarize the following procedures for attribute subset selection:
  - 1) stepwise forward selection
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  - 3) a combination of forward selection and backward elimination
- b) Give an example of classification using prediction.
- c) Explain KDD in detail.

**Section – II**

**Q.4 Attempt any three.** **12**

- a) How do you measure the quality of rules?
- b) What are advanced association rule techniques?
- c) Explain – BIRCH
- d) What is cluster analysis?

**Q.5 Attempt any two.** **16**

- a) What do you mean by partitioning?
- b) Describe web content mining.
- c) Elaborate the types of outliers. Identify an outlier using clustering-based outlier detection method with suitable example.

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

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- 1) Which of the following is not a data pre-processing methods?  
 a) Data Visualization                      b) Data Discretization  
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- 2) The difference between supervised learning and unsupervised learning is given by \_\_\_\_\_.  
 a) unlike unsupervised learning, supervised learning needs labeled data  
 b) unlike unsupervised learning, supervised learning can be used to detect outliers  
 c) there is no difference  
 d) unlike supervised learning, unsupervised learning can form new classes
- 3) Which data mining task can be used for predicting wind velocities as a function of temperature, humidity, air pressure, etc.?  
 a) Cluster Analysis                              b) Regression  
 c) Classification                                d) Sequential pattern discovery
- 4) The number of iterations in Apriori \_\_\_\_\_.  
 a) increases with the size of the data  
 b) decreases with the increase in size of the data  
 c) increases with the size of the maximum frequent set  
 d) decreases with increase in size of the maximum frequent set
- 5) Which of the following are interestingness measures for association rules?  
 a) recall    b) lift  
 c) accuracy                                        d) compactness
- 6) This clustering algorithm terminates when mean values computed for the current iteration of the algorithm are identical to the computed mean values for the previous iteration \_\_\_\_\_.  
 a) K-Means clustering                              b) conceptual clustering  
 c) expectation maximization                      d) agglomerative clustering

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  - c) Extracting the frequencies of a sound wave
  - d) Monitoring the heart rate of a patient for abnormalities

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
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Day & Date: Thursday, 09-02-2023  
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Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
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**Section – I**

**Q.2 Attempt any three.** **12**

- a) What are major issues in data mining?
- b) What are major tasks in Data Preprocessing?
- c) What are the issues in classification? Explain with example.
- d) Explain frequent pattern mining.

**Q.3 Attempt any two.** **16**

- a) Use a flowchart to summarize the following procedures for attribute subset selection:
  - 1) stepwise forward selection
  - 2) stepwise backward elimination
  - 3) a combination of forward selection and backward elimination
- b) Give an example of classification using prediction.
- c) Explain KDD in detail.

**Section – II**

**Q.4 Attempt any three.** **12**

- a) How do you measure the quality of rules?
- b) What are advanced association rule techniques?
- c) Explain – BIRCH
- d) What is cluster analysis?

**Q.5 Attempt any two.** **16**

- a) What do you mean by partitioning?
- b) Describe web content mining.
- c) Elaborate the types of outliers. Identify an outlier using clustering-based outlier detection method with suitable example.

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- 7) DSS is widely used in the \_\_\_\_\_.  
a) System implementation      b) System flow  
c) Planning      d) Making system
- 8) Which of the following is / are Components of an Expert System?  
a) User Interface  
b) Interference Engine  
c) Knowledge Base & Data Acquisition Subsystem  
d) All of the above mentioned
- 9) Which of the following Activities are associated with Strategic Management?  
a) MIS strategy set → Organizational strategy set  
b) Organizational strategy set → MIS strategy set  
c) Business Process Set → MIS strategy set  
d) None of the above mentioned
- 10) \_\_\_\_\_ is able to provide a specific niche or segment with the capabilities to identify, extend, and need of an organization.  
a) System flow  
b) Data flow diagram  
c) Strategic Management Information System  
d) None of the above mentioned
- 11) The basic component/components of Decision Support System is/are, \_\_\_\_\_.  
a) Database      b) Model base  
c) DSS software system      d) All of the above
- 12) Business intelligence Contemporary tools  
a) Data warehouses      b) Data marts  
c) Hadoop      d) All above
- 13) \_\_\_\_\_ is not types of e-commerce.  
a) Business-to-consumer(B2C)      b) Business-to-business (B2B)  
c) Consumer-to-business (C2B)      d) Consumer-to-consumer (C2C)
- 14) Following is not Problems with the traditional file environment.  
a) Data redundancy      b) Data inconsistency  
c) consistency      d) data dependence

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Differentiate any Three:** **12**
- a) Decision-support system (DSS) and Executive support system (ESS).
  - b) Primary activities v/s Secondary activities of a Business value chain model.
  - c) Transaction Processing Systems and Management Information Systems
  - d) Industrial design and Patent
- Q.3 Solve any Two questions.** **16**
- a) What is Porter's competitive forces model?
  - b) Explain what is meant by a socio-technical systems perspective.
  - c) What are effects of information systems on business and their relationship to globalization?

**Section – II**

- Q.4 Solve any Three questions.** **12**
- a) What are the legal traditions that protect intellectual property?
  - b) How a step-by-step ethical analysis can be performed?
  - c) What are the policies for Organizational Security?
  - d) How Business Intelligence advantage over traditional file environment?
- Q.5 Solve any Two questions.** **16**
- a) What is the role of M-commerce in business & its applications?
  - b) Explain what is meant by Business intelligence systems perspective.
  - c) How the Security of Management of Information Technology can be apply?

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) Which of the following is / are Components of an Expert System?
  - a) User Interface
  - b) Inference Engine
  - c) Knowledge Base & Data Acquisition Subsystem
  - d) All of the above mentioned
- 2) Which of the following Activities are associated with Strategic Management?
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- 4) The basic component/components of Decision Support System is/are, \_\_\_\_\_.
 

a) Database	b) Model base
c) DSS software system	d) All of the above
- 5) Business intelligence Contemporary tools
 

a) Data warehouses	b) Data marts
c) Hadoop	d) All above
- 6) \_\_\_\_\_ is not types of e-commerce.
 

a) Business-to-consumer(B2C)	b) Business-to-business (B2B)
c) Consumer-to-business (C2B)	d) Consumer-to-consumer (C2C)
- 7) Following is not Problems with the traditional file environment.
 

a) Data redundancy	b) Data inconsistency
c) consistency	d) data dependence

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Management Information System**

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<b>Seat No.</b>	
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- 9) Which of the following is not an objective of MIS?
- a) Supports in decision-making      b) Provides insightful information
  - c) Assist management people      d) Recruit people for system
- 10) The phases which are used in MIS design are as follows \_\_\_\_\_.  
a) Problem identification → Analysis → Design → Implementation → Maintenance  
b) Analysis → Problem identification → Implementation → Design → Maintenance  
c) Problem identification → Implementation → Analysis → Design → Maintenance  
d) Implementation → Analysis → Design → Problem identification → Maintenance
- 11) DSS is widely used in the \_\_\_\_\_.  
a) System implementation      b) System flow  
c) Planning      d) Making system
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- 14) \_\_\_\_\_ is able to provide a specific niche or segment with the capabilities to identify, extend, and need of an organization.  
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c) Strategic Management Information System  
d) None of the above mentioned

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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**Section – I**

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**Section – II**

- Q.4 Solve any Three questions.** **12**
- a) What are the legal traditions that protect intellectual property?
  - b) How a step-by-step ethical analysis can be performed?
  - c) What are the policies for Organizational Security?
  - d) How Business Intelligence advantage over traditional file environment?
- Q.5 Solve any Two questions.** **16**
- a) What is the role of M-commerce in business & its applications?
  - b) Explain what is meant by Business intelligence systems perspective.
  - c) How the Security of Management of Information Technology can be apply?



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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

**14**

- 1) The phases which are used in MIS design are as follows \_\_\_\_\_.
  - a) Problem identification → Analysis → Design → Implementation → Maintenance
  - b) Analysis → Problem identification → Implementation → Design → Maintenance
  - c) Problem identification → Implementation → Analysis → Design → Maintenance
  - d) Implementation → Analysis → Design → Problem identification → Maintenance
- 2) DSS is widely used in the \_\_\_\_\_.
  - a) System implementation
  - b) System flow
  - c) Planning
  - d) Making system
- 3) Which of the following is / are Components of an Expert System?
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- 5) \_\_\_\_\_ is able to provide a specific niche or segment with the capabilities to identify, extend, and need of an organization.
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  - b) Data flow diagram
  - c) Strategic Management Information System
  - d) None of the above mentioned
- 6) The basic component/components of Decision Support System is/are, \_\_\_\_\_.
  - a) Database
  - b) Model base
  - c) DSS software system
  - d) All of the above

- 7) Business intelligence Contemporary tools  
a) Data warehouses                      b) Data marts  
c) Hadoop                                  d) All above
- 8) \_\_\_\_\_ is not types of e-commerce.  
a) Business-to-consumer(B2C)      b) Business-to-business (B2B)  
c) Consumer-to-business (C2B)      d) Consumer-to-consumer (C2C)
- 9) Following is not Problems with the traditional file environment.  
a) Data redundancy                      b) Data inconsistency  
c) consistency                              d) data dependence
- 10) The principles and standards that guide our behavior toward other people are called: \_\_\_\_\_.  
a) Ethics                                      b) Intellectual property  
c) Copyrights                                d) patents
- 11) The situation in which one accepts the potential costs, duties, and obligations for the decisions one makes is called: \_\_\_\_\_.  
a) due process                              b) informed consent  
c) responsibility                              d) accountability
- 12) The statement that if an action is not right for everyone to take it is not right for anyone to take is an expression of: \_\_\_\_\_.  
a) the Risk Aversion Principal          b) the rule of change  
c) the Categorical Imperative          d) the Utilitarian Principal
- 13) A key role of Management Information Systems is, \_\_\_\_\_.  
a) To develop and share documents that support day-to-day organizational activities  
b) To process business information  
c) To materialize the business transaction data and produce insightful information which assists managers in decision making  
d) None of the above
- 14) Which of the following is not an objective of MIS?  
a) Supports in decision-making      b) Provides insightful information  
c) Assist management people          d) Recruit people for system

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Management Information System**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Differentiate any Three:** **12**
- a) Decision-support system (DSS) and Executive support system (ESS).
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  - d) Industrial design and Patent
- Q.3 Solve any Two questions.** **16**
- a) What is Porter's competitive forces model?
  - b) Explain what is meant by a socio-technical systems perspective.
  - c) What are effects of information systems on business and their relationship to globalization?

**Section – II**

- Q.4 Solve any Three questions.** **12**
- a) What are the legal traditions that protect intellectual property?
  - b) How a step-by-step ethical analysis can be performed?
  - c) What are the policies for Organizational Security?
  - d) How Business Intelligence advantage over traditional file environment?
- Q.5 Solve any Two questions.** **16**
- a) What is the role of M-commerce in business & its applications?
  - b) Explain what is meant by Business intelligence systems perspective.
  - c) How the Security of Management of Information Technology can be apply?

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Assurance and Security**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options.**

**14**

- 1) A \_\_\_\_\_ is difficult to detect, because they do not allow any alteration of data.
  - i) Active attack
  - ii) Passive attack
  - iii) Network attack
  - iv) Cyber attack
- a) Only I
  - b) Only II
  - c) I and II both
  - d) I, II, IV
- 2) \_\_\_\_\_ is the protection of data from unauthorized disclosure.
  - a) Message Authentication
  - b) Data Confidentiality
  - c) Access Control
  - d) Data integrity
- 3) Encryption protects against:
  - a) Attacks
  - b) Viruses
  - c) Manipulation of data
  - d) All of the above
- 4) What is an advantage of RSA over DES?
  - a) It can provide digital signature and encryption functionality
  - b) It uses fewer resources and encrypts quicker because it uses symmetric keys
  - c) It is a block cipher versus a stream cipher
  - d) It employs a one-time encryption pad
- 5) \_\_\_\_\_ defines public key infrastructure
  - a) RFC 2822
  - b) RFA 3024
  - c) RFC 2228
  - d) None of these
- 6) Which of the following field in digital certificate is/are optional?
  - a) Certificate validity period
  - b) Subject's common name
  - c) Issuer public key
  - d) Issuer office address
- a) 1 & 2
  - b) 2 & 3
  - c) 1,3 & 4
  - d) 3 & 4

- 7) In IPSec Security association, before two parties can communicate securely, they need to establish \_\_\_\_\_.  
a) security association(SA)  
b) authentication header(AH)  
c) encapsulating security payload(ESEP)  
d) none of above
- 8) The method of cracking the password by noting the key strokes of keyboard is called \_\_\_\_\_.  
a) phishing  
b) spyware  
c) keylogging  
d) all the above
- 9) Which of these is not a type of malware?  
a) Worm  
b) Horses  
c) Virus  
d) Botnets
- 10) What are the examples of malware spreads?  
a) Social Network  
b) Pirated Software  
c) Removable Media  
d) All the above
- 11) \_\_\_\_\_ is a computer on a network which acts as an intermediary for connections with other computers on that network.  
a) Hot Spot  
b) Proxy Server  
c) Host machine  
d) Main Server machine
- 12) IP Level security encompasses three functional areas: \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.  
a) Authentication confidentiality and integrity  
b) Confidentiality, integrity and Peer Authentication  
c) Authentication, confidentiality and Key Management  
d) Access Control, Resource availability and Key management
- 13) The classes of intruders identified by Anderson are:  
1. Masquerader  
2. Criminal  
3. Misfeasor  
4. Culprit  
5. Clandestine User  
a) 1,3,4, 5  
b) 1,2,3  
c) 1,3,5  
d) All of the above
- 14) The advantage of Internet of Key Exchange (IKE) Phase 1 main mode over IKE Phase 1 aggressive mode is \_\_\_\_\_.  
a) main mode uses fewer messages  
b) main mode provides greater security  
c) main mode hides the identities of the communicating entities  
d) main mode has a larger suite of options for key exchange right

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
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Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any three of the following** **12**

- a) Describe the model for network security stating the basic tasks in designing a particular security service.
- b) Discuss the X.509 Certificates
- c) Explain in detail with diagram:
  - i) SSL Architecture
  - ii) SSL Record Protocol and its Operation
- d) Elaborate transposition cipher and substitution cipher with an example each.

**Q.3 Answer any one** **08**

- a) Elaborate the depiction of DES Encryption Algorithm with diagram. Also highlight the strengths of DES.

**OR**

- b) Elaborate the working of Classical Feistel Network and state the parameters and design choices that determine the actual algorithm of a Feistel cipher structure.

**Q.4 Answer the following** **08**

Describe RSA algorithm for keys generation. Using RSA algorithm perform encryption and decryption for  $p=3$ ;  $q=11$ ,  $e=7$ ;  $M=5$

**Section - II**

**Q.5 Attempt any three of the following** **12**

- a) Describe the five principles services provided by PGP.
- b) Compare Kerberos 4 Vs Kerberos 5
- c) Difference between Proxy server and an anonymizer.
- d) Differentiate MIME and S/MIME.

**Q.6 Answer any one** **08**

- a) State the services provides by IPSec. Give application of IP Sec.

**OR**

- b) Define Virus. How do viruses get disseminated? Explain with diagrams.

**Q.7 Answer the following**

Describe the following:

- a) Social Engineering
- b) Cyber stalking
- c) Steganography
- d) Botnets

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Assurance and Security**

Max. Marks: 70

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Marks: 14

14

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Assurance and Security**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

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**Section – I**

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**Section - II**

**Q.5 Attempt any three of the following** **12**

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- c) Steganography
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Seat No.	
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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Assurance and Security**

Day & Date: Thursday, 16-02-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options.**

**14**

- 1) \_\_\_\_\_ is a computer on a network which acts as an intermediary for connections with other computers on that network.
  - a) Hot Spot
  - b) Proxy Server
  - c) Host machine
  - d) Main Server machine
- 2) IP Level security encompasses three functional areas: \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
  - a) Authentication confidentiality and integrity
  - b) Confidentiality, integrity and Peer Authentication
  - c) Authentication, confidentiality and Key Management
  - d) Access Control, Resource availability and Key management
- 3) The classes of intruders identified by Anderson are:
  1. Masquerader
  2. Criminal
  3. Misfeasor
  4. Culprit
  5. Clandestine User
  - a) 1,3,4, 5
  - b) 1,2,3
  - c) 1,3,5
  - d) All of the above
- 4) The advantage of Internet of Key Exchange (IKE) Phase 1 main mode over IKE Phase 1 aggressive mode is \_\_\_\_\_.
  - a) main mode uses fewer messages
  - b) main mode provides greater security
  - c) main mode hides the identities of the communicating entities
  - d) main mode has a larger suite of options for key exchange right
- 5) A \_\_\_\_\_ is difficult to detect, because they do not allow any alteration of data.
  - i) Active attack
  - ii) Passive attack
  - iii) Network attack
  - iv) Cyber attack
  - a) Only I
  - b) Only II
  - c) I and II both
  - d) I, II, IV

- 6) \_\_\_\_\_ is the protection of data from unauthorized disclosure.
- a) Message Authentication
  - b) Data Confidentiality
  - c) Access Control
  - d) Data integrity
- 7) Encryption protects against:
- a) Attacks
  - b) Viruses
  - c) Manipulation of data
  - d) All of the above
- 8) What is an advantage of RSA over DES?
- a) It can provide digital signature and encryption functionality
  - b) It uses fewer resources and encrypts quicker because it uses symmetric keys
  - c) It is a block cipher versus a stream cipher
  - d) It employs a one-time encryption pad
- 9) \_\_\_\_\_ defines public key infrastructure
- a) RFC 2822
  - b) RFA 3024
  - c) RFC 2228
  - d) None of these
- 10) Which of the following field in digital certificate is/are optional?
- a) Certificate validity period
  - b) Subject's common name
  - c) Issuer public key
  - d) Issuer office address
- a) 1 & 2
  - b) 2 & 3
  - c) 1,3 & 4
  - d) 3 & 4
- 11) In IPsec Security association, before two parties can communicate securely, they need to establish \_\_\_\_\_.
- a) security association(SA)
  - b) authentication header(AH)
  - c) encapsulating security payload(ESEP)
  - d) none of above
- 12) The method of cracking the password by noting the key strokes of keyboard is called \_\_\_\_\_.
- a) phishing
  - b) spyware
  - c) keylogging
  - d) all the above
- 13) Which of these is not a type of malware?
- a) Worm
  - b) Horses
  - c) Virus
  - d) Botnets
- 14) What are the examples of malware spreads?
- a) Social Network
  - b) Pirated Software
  - c) Removable Media
  - d) All the above

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Assurance and Security**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Do not use pen to draw and label the diagrams.

**Section – I**

**Q.2 Attempt any three of the following** **12**

- a) Describe the model for network security stating the basic tasks in designing a particular security service.
- b) Discuss the X.509 Certificates
- c) Explain in detail with diagram:
  - i) SSL Architecture
  - ii) SSL Record Protocol and its Operation
- d) Elaborate transposition cipher and substitution cipher with an example each.

**Q.3 Answer any one** **08**

- a) Elaborate the depiction of DES Encryption Algorithm with diagram. Also highlight the strengths of DES.

**OR**

- b) Elaborate the working of Classical Feistel Network and state the parameters and design choices that determine the actual algorithm of a Feistel cipher structure.

**Q.4 Answer the following** **08**

Describe RSA algorithm for keys generation. Using RSA algorithm perform encryption and decryption for  $p=3$ ;  $q=11$ ,  $e=7$ ;  $M=5$

**Section - II**

**Q.5 Attempt any three of the following** **12**

- a) Describe the five principles services provided by PGP.
- b) Compare Kerberos 4 Vs Kerberos 5
- c) Difference between Proxy server and an anonymizer.
- d) Differentiate MIME and S/MIME.

**Q.6 Answer any one** **08**

- a) State the services provides by IPSec. Give application of IP Sec.

**OR**

- b) Define Virus. How do viruses get disseminated? Explain with diagrams.

**Q.7 Answer the following**

Describe the following:

- a) Social Engineering
- b) Cyber stalking
- c) Steganography
- d) Botnets

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Set **S**

**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Assurance and Security**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page  
 3) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options.****14**

- 1) Which of the following field in digital certificate is/are optional?
  - a) Certificate validity period
  - b) Subject's common name
  - c) Issuer public key
  - d) Issuer office address
  - a) 1 & 2
  - b) 2 & 3
  - c) 1,3 & 4
  - d) 3 & 4
- 2) In IPSec Security association, before two parties can communicate securely, they need to establish \_\_\_\_\_.
  - a) security association(SA)
  - b) authentication header(AH)
  - c) encapsulating security payload(ESEP)
  - d) none of above
- 3) The method of cracking the password by noting the key strokes of keyboard is called \_\_\_\_\_.
  - a) phishing
  - b) spyware
  - c) keylogging
  - d) all the above
- 4) Which of these is not a type of malware?
  - a) Worm
  - b) Horses
  - c) Virus
  - d) Botnets
- 5) What are the examples of malware spreads?
  - a) Social Network
  - b) Pirated Software
  - c) Removable Media
  - d) All the above
- 6) \_\_\_\_\_ is a computer on a network which acts as an intermediary for connections with other computers on that network.
  - a) Hot Spot
  - b) Proxy Server
  - c) Host machine
  - d) Main Server machine



- 7) IP Level security encompasses three functional areas: \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- Authentication confidentiality and integrity
  - Confidentiality, integrity and Peer Authentication
  - Authentication, confidentiality and Key Management
  - Access Control, Resource availability and Key management
- 8) The classes of intruders identified by Anderson are:
- Masquerader
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  - Culprit
  - Clandestine User
- 1,3,4, 5
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  - 1,3,5
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- main mode uses fewer messages
  - main mode provides greater security
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  - main mode has a larger suite of options for key exchange right
- 10) A \_\_\_\_\_ is difficult to detect, because they do not allow any alteration of data.
- Active attack
  - Passive attack
  - Network attack
  - Cyber attack
- Only I
  - Only II
  - I and II both
  - I, II, IV
- 11) \_\_\_\_\_ is the protection of data from unauthorized disclosure.
- Message Authentication
  - Data Confidentiality
  - Access Control
  - Data integrity
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  - Viruses
  - Manipulation of data
  - All of the above
- 13) What is an advantage of RSA over DES?
- It can provide digital signature and encryption functionality
  - It uses fewer resources and encrypts quicker because it uses symmetric keys
  - It is a block cipher versus a stream cipher
  - It employs a one-time encryption pad
- 14) \_\_\_\_\_ defines public key infrastructure
- RFC 2822
  - RFA 3024
  - RFC 2228
  - None of these

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Assurance and Security**

Day &amp; Date: Thursday, 16-02-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Do not use pen to draw and label the diagrams.

**Section – I**

**Q.2 Attempt any three of the following** **12**

- a) Describe the model for network security stating the basic tasks in designing a particular security service.
- b) Discuss the X.509 Certificates
- c) Explain in detail with diagram:
  - i) SSL Architecture
  - ii) SSL Record Protocol and its Operation
- d) Elaborate transposition cipher and substitution cipher with an example each.

**Q.3 Answer any one** **08**

- a) Elaborate the depiction of DES Encryption Algorithm with diagram. Also highlight the strengths of DES.

**OR**

- b) Elaborate the working of Classical Feistel Network and state the parameters and design choices that determine the actual algorithm of a Feistel cipher structure.

**Q.4 Answer the following** **08**

Describe RSA algorithm for keys generation. Using RSA algorithm perform encryption and decryption for  $p=3$ ;  $q=11$ ,  $e=7$ ;  $M=5$

**Section - II**

**Q.5 Attempt any three of the following** **12**

- a) Describe the five principles services provided by PGP.
- b) Compare Kerberos 4 Vs Kerberos 5
- c) Difference between Proxy server and an anonymizer.
- d) Differentiate MIME and S/MIME.

**Q.6 Answer any one** **08**

- a) State the services provides by IPSec. Give application of IP Sec.

**OR**

- b) Define Virus. How do viruses get disseminated? Explain with diagrams.

**Q.7 Answer the following**

Describe the following:

- a) Social Engineering
- b) Cyber stalking
- c) Steganography
- d) Botnets

<b>Seat No.</b>	
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**Forth. Y (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer book page no.3. each question carries one marks.  
2) Figures to the right indicates full marks.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Specify the category of consumer complaints and feedback \_\_\_\_\_.  
a) Structured                                      b) Semi-structured  
c) Unstructured                                    d) Relational data
- 2) The term NoSQL was first coined by \_\_\_\_\_.  
a) Doug Laney                                     b) Carlo Strozzi  
c) Brewer    d) Gartner
- 3) In CAP Theorem, every read fetches the most recent write is \_\_\_\_\_.  
a) Consistency                                    b) Availability  
c) Partition Tolerant                            d) None of the above
- 4) "Heartbeat" message is sent by \_\_\_\_\_ node to \_\_\_\_\_ node.  
a) Data, Name                                    b) Name, Data  
c) Secondary Name, Name                    d) Name, Secondary Name
- 5) The real time processing is deals with which of the following characteristics?  
a) Volume                                         b) Volatility  
c) Variability                                      d) Velocity
- 6) The \_\_\_\_\_ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.  
a) Massively Parallel Processing  
b) In-Memory analytics  
c) Symmetric Multiprocessing System  
d) Distributed Systems
- 7) Analytics 3.0 provides \_\_\_\_\_.  
a) Descriptive Statistics                      b) Predictive Statistics  
c) Prescriptive Statistics                      d) All
- 8) Which of the following command is correct when we want to fetch documents from a collection for "only those employees whose salary is either 8500 or 10000"?  
a) db.employees.find.sort({"salary": {\$in:[8500,1000]}})  
b) db.employees.find({"salary": {\$in:[8500,1000]}})  
c) db.employees.find({"salary": {"\$in:[8500,1000]"}})  
d) db.employees.find({"salary": {\$in:{8500,1000}}})

- 9) Which of the following statement is true about Cassandra?
- a) Cassandra does not have master-slave architecture
  - b) Cassandra was born at Facebook
  - c) Cassandra is highly scalable, high performance distributed database
  - d) All
- 10) Cassandra is a column-oriented database designed to supports \_\_\_\_\_ symmetric node architecture.
- a) Peer-to-peer
  - b) Master-slave
  - c) Both a & b
  - d) None of above
- 11) Pig is \_\_\_\_\_.
- a) Data Flow language
  - b) NoSQL database
  - c) Import Export tool
  - d) Scheduling engine
- 12) Hive is a \_\_\_\_\_ tool.
- a) Data Flow
  - b) Data transfer
  - c) Column-oriented
  - d) Data Warehousing
- 13) \_\_\_\_\_ analytics is used to drive direct business revenue.
- a) Basic Analytics
  - b) Operationalized Analytics
  - c) Advanced Analytics
  - d) Monetized Analytics
- 14) The most commonly used interface to interact with Hive is \_\_\_\_\_.
- a) Command Line Interface
  - b) Graphical User Interface
  - c) Both a and b
  - d) None

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**Forth. Y (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What is Big Data Analytics? Explain second schools of thought of Big Data Analytics.
- b) What are the Sources of Structured data? Why it is easy to work with structured data?
- c) Explain Hadoop Ecosystem.
- d) Discuss the challenges in Big data.

**Q.3 Attempt any TWO.** **16**

- a) Analyze anatomy of File read and File Write operations in HDFS Daemons and write steps with the diagram.
- b) Write a short note on Data Science, and CAP Theorem.
- c) What are the limitations of Hadoop 1.0 architecture? Explain YARN Architecture in detail.

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Explain Map Reduce programming in MongoDB with suitable example.
- b) Explain Hinted Handoffs feature of Cassandra with diagram.
- c) Write difference between SQL and MongoDB.
- d) Write mongodb queries for the following operations
  - 1) Create a collection for Results with fields as: \_id, Name, Percentage, Grade.
  - 2) Insert 5 students' documents in the Results collection.
  - 3) Display the collection according to the percentage from highest to lowest.

**Q.5 Attempt any TWO.** **16**

- a) What is Pig and Pig philosophy? Describe anatomy of Pig.
- b) Explain the features of Cassandra. What are the collections in CQLSH?
- c) What is Hive? Explain Hive Architecture in detail.

Seat No.	
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**Forth. Y (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer book page no.3. each question carries one marks.  
 2) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following command is correct when we want to fetch documents from a collection for “only those employees whose salary is either 8500 or 10000”?
  - a) db.employees.find.sort({"salary": {"\$in":[8500,1000]}})
  - b) db.employees.find({"salary": {"\$in":[8500,1000]}})
  - c) db.employees.find({"salary": {"\$in:[8500,1000]}})
  - d) db.employees.find({"salary": {"\$in:{8500,1000}}})
- 2) Which of the following statement is true about Cassandra?
  - a) Cassandra does not have master-slave architecture
  - b) Cassandra was born at Facebook
  - c) Cassandra is highly scalable, high performance distributed database
  - d) All
- 3) Cassandra is a column-oriented database designed to supports \_\_\_\_\_ symmetric node architecture.
  - a) Peer-to-peer
  - b) Master-slave
  - c) Both a & b
  - d) None of above
- 4) Pig is \_\_\_\_\_.
  - a) Data Flow language
  - b) NoSQL database
  - c) Import Export tool
  - d) Scheduling engine
- 5) Hive is a \_\_\_\_\_ tool.
  - a) Data Flow
  - b) Data transfer
  - c) Column-oriented
  - d) Data Warehousing
- 6) \_\_\_\_\_ analytics is used to drive direct business revenue.
  - a) Basic Analytics
  - b) Operationalized Analytics
  - c) Advanced Analytics
  - d) Monetized Analytics
- 7) The most commonly used interface to interact with Hive is \_\_\_\_\_.
  - a) Command Line Interface
  - b) Graphical User Interface
  - c) Both a and b
  - d) None
- 8) Specify the category of consumer complaints and feedback \_\_\_\_\_.
  - a) Structured
  - b) Semi-structured
  - c) Unstructured
  - d) Relational data

- 9) The term NoSQL was first coined by \_\_\_\_\_.
  - a) Doug Laney
  - b) Carlo Strozzi
  - c) Brewer
  - d) Gartner
- 10) In CAP Theorem, every read fetches the most recent write is \_\_\_\_\_.
  - a) Consistency
  - b) Availability
  - c) Partition Tolerant
  - d) None of the above
- 11) "Heartbeat" message is sent by \_\_\_\_\_ node to \_\_\_\_\_ node.
  - a) Data, Name
  - b) Name, Data
  - c) Secondary Name, Name
  - d) Name, Secondary Name
- 12) The real time processing is deals with which of the following characteristics?
  - a) Volume
  - b) Volatility
  - c) Variability
  - d) Velocity
- 13) The \_\_\_\_\_ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
  - a) Massively Parallel Processing
  - b) In-Memory analytics
  - c) Symmetric Multiprocessing System
  - d) Distributed Systems
- 14) Analytics 3.0 provides \_\_\_\_\_.
  - a) Descriptive Statistics
  - b) Predictive Statistics
  - c) Prescriptive Statistics
  - d) All



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**Forth. Y (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What is Big Data Analytics? Explain second schools of thought of Big Data Analytics.
- b) What are the Sources of Structured data? Why it is easy to work with structured data?
- c) Explain Hadoop Ecosystem.
- d) Discuss the challenges in Big data.

**Q.3 Attempt any TWO.** **16**

- a) Analyze anatomy of File read and File Write operations in HDFS Daemons and write steps with the diagram.
- b) Write a short note on Data Science, and CAP Theorem.
- c) What are the limitations of Hadoop 1.0 architecture? Explain YARN Architecture in detail.

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Explain Map Reduce programming in MongoDB with suitable example.
- b) Explain Hinted Handoffs feature of Cassandra with diagram.
- c) Write difference between SQL and MongoDB.
- d) Write mongodb queries for the following operations
  - 1) Create a collection for Results with fields as: \_id, Name, Percentage, Grade.
  - 2) Insert 5 students' documents in the Results collection.
  - 3) Display the collection according to the percentage from highest to lowest.

**Q.5 Attempt any TWO.** **16**

- a) What is Pig and Pig philosophy? Describe anatomy of Pig.
- b) Explain the features of Cassandra. What are the collections in CQLSH?
- c) What is Hive? Explain Hive Architecture in detail.

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**Forth. Y (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Pig is \_\_\_\_\_.  
 a) Data Flow language                      b) NoSQL database  
 c) Import Export tool                        d) Scheduling engine
- 2) Hive is a \_\_\_\_\_ tool.  
 a) Data Flow                                      b) Data transfer  
 c) Column-oriented                            d) Data Warehousing
- 3) \_\_\_\_\_ analytics is used to drive direct business revenue.  
 a) Basic Analytics                              b) Operationalized Analytics  
 c) Advanced Analytics                        d) Monetized Analytics
- 4) The most commonly used interface to interact with Hive is \_\_\_\_\_.  
 a) Command Line Interface                  b) Graphical User Interface  
 c) Both a and b                                  d) None
- 5) Specify the category of consumer complaints and feedback \_\_\_\_\_.  
 a) Structured                                      b) Semi-structured  
 c) Unstructured                                   d) Relational data
- 6) The term NoSQL was first coined by \_\_\_\_\_.  
 a) Doug Laney                                    b) Carlo Strozzi  
 c) Brewer    d) Gartner
- 7) In CAP Theorem, every read fetches the most recent write is \_\_\_\_\_.  
 a) Consistency                                   b) Availability  
 c) Partition Tolerant                            d) None of the above
- 8) "Heartbeat" message is sent by \_\_\_\_\_ node to \_\_\_\_\_ node.  
 a) Data, Name                                    b) Name, Data  
 c) Secondary Name, Name                    d) Name, Secondary Name
- 9) The real time processing is deals with which of the following characteristics?  
 a) Volume    b) Volatility  
 c) Variability                                      d) Velocity

- 10)** The \_\_\_\_\_ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
- a) Massively Parallel Processing
  - b) In-Memory analytics
  - c) Symmetric Multiprocessing System
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- 11)** Analytics 3.0 provides \_\_\_\_\_.
- a) Descriptive Statistics
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- 12)** Which of the following command is correct when we want to fetch documents from a collection for "only those employees whose salary is either 8500 or 10000"?
- a) `db.employees.find.sort({"salary": {$in:[8500,1000]}})`
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  - c) Both a & b
  - d) None of above

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**Forth. Y (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What is Big Data Analytics? Explain second schools of thought of Big Data Analytics.
- b) What are the Sources of Structured data? Why it is easy to work with structured data?
- c) Explain Hadoop Ecosystem.
- d) Discuss the challenges in Big data.

**Q.3 Attempt any TWO.** **16**

- a) Analyze anatomy of File read and File Write operations in HDFS Daemons and write steps with the diagram.
- b) Write a short note on Data Science, and CAP Theorem.
- c) What are the limitations of Hadoop 1.0 architecture? Explain YARN Architecture in detail.

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Explain Map Reduce programming in MongoDB with suitable example.
- b) Explain Hinted Handoffs feature of Cassandra with diagram.
- c) Write difference between SQL and MongoDB.
- d) Write mongodb queries for the following operations
  - 1) Create a collection for Results with fields as: \_id, Name, Percentage, Grade.
  - 2) Insert 5 students' documents in the Results collection.
  - 3) Display the collection according to the percentage from highest to lowest.

**Q.5 Attempt any TWO.** **16**

- a) What is Pig and Pig philosophy? Describe anatomy of Pig.
- b) Explain the features of Cassandra. What are the collections in CQLSH?
- c) What is Hive? Explain Hive Architecture in detail.

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**Forth. Y (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer book page no.3. each question carries one marks.  
 2) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The \_\_\_\_\_ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
  - a) Massively Parallel Processing
  - b) In-Memory analytics
  - c) Symmetric Multiprocessing System
  - d) Distributed Systems
- 2) Analytics 3.0 provides \_\_\_\_\_.
  - a) Descriptive Statistics
  - b) Predictive Statistics
  - c) Prescriptive Statistics
  - d) All
- 3) Which of the following command is correct when we want to fetch documents from a collection for "only those employees whose salary is either 8500 or 10000"?
  - a) db.employees.find.sort({"salary": {\$in:[8500,1000]}})
  - b) db.employees.find({"salary": {\$in:[8500,1000]}})
  - c) db.employees.find({"salary": {"\$in:[8500,1000]}})
  - d) db.employees.find({"salary": {\$in:{8500,1000}}})
- 4) Which of the following statement is true about Cassandra?
  - a) Cassandra does not have master-slave architecture
  - b) Cassandra was born at Facebook
  - c) Cassandra is highly scalable, high performance distributed database
  - d) All
- 5) Cassandra is a column-oriented database designed to supports \_\_\_\_\_ symmetric node architecture.
  - a) Peer-to-peer
  - b) Master-slave
  - c) Both a & b
  - d) None of above
- 6) Pig is \_\_\_\_\_.
  - a) Data Flow language
  - b) NoSQL database
  - c) Import Export tool
  - d) Scheduling engine
- 7) Hive is a \_\_\_\_\_ tool.
  - a) Data Flow
  - b) Data transfer
  - c) Column-oriented
  - d) Data Warehousing

- 8) \_\_\_\_\_ analytics is used to drive direct business revenue.
- a) Basic Analytics
  - b) Operationalized Analytics
  - c) Advanced Analytics
  - d) Monetized Analytics
- 9) The most commonly used interface to interact with Hive is \_\_\_\_\_.
- a) Command Line Interface
  - b) Graphical User Interface
  - c) Both a and b
  - d) None
- 10) Specify the category of consumer complaints and feedback \_\_\_\_\_.
- a) Structured
  - b) Semi-structured
  - c) Unstructured
  - d) Relational data
- 11) The term NoSQL was first coined by \_\_\_\_\_.
- a) Doug Laney
  - b) Carlo Strozzi
  - c) Brewer
  - d) Gartner
- 12) In CAP Theorem, every read fetches the most recent write is \_\_\_\_\_.
- a) Consistency
  - b) Availability
  - c) Partition Tolerant
  - d) None of the above
- 13) "Heartbeat" message is sent by \_\_\_\_\_ node to \_\_\_\_\_ node.
- a) Data, Name
  - b) Name, Data
  - c) Secondary Name, Name
  - d) Name, Secondary Name
- 14) The real time processing is deals with which of the following characteristics?
- a) Volume
  - b) Volatility
  - c) Variability
  - d) Velocity

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**Forth. Y (B. Tech) (Sem– II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Big Data Analytics**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) What is Big Data Analytics? Explain second schools of thought of Big Data Analytics.
- b) What are the Sources of Structured data? Why it is easy to work with structured data?
- c) Explain Hadoop Ecosystem.
- d) Discuss the challenges in Big data.

**Q.3 Attempt any TWO.** **16**

- a) Analyze anatomy of File read and File Write operations in HDFS Daemons and write steps with the diagram.
- b) Write a short note on Data Science, and CAP Theorem.
- c) What are the limitations of Hadoop 1.0 architecture? Explain YARN Architecture in detail.

**Section – II**

**Q.4 Attempt any THREE.** **12**

- a) Explain Map Reduce programming in MongoDB with suitable example.
- b) Explain Hinted Handoffs feature of Cassandra with diagram.
- c) Write difference between SQL and MongoDB.
- d) Write mongodb queries for the following operations
  - 1) Create a collection for Results with fields as: \_id, Name, Percentage, Grade.
  - 2) Insert 5 students' documents in the Results collection.
  - 3) Display the collection according to the percentage from highest to lowest.

**Q.5 Attempt any TWO.** **16**

- a) What is Pig and Pig philosophy? Describe anatomy of Pig.
- b) Explain the features of Cassandra. What are the collections in CQLSH?
- c) What is Hive? Explain Hive Architecture in detail.

Seat No.	
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cloud Computing**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is considered an essential element in cloud computing by CSA?
  - a) Multi-tenancy
  - b) Identity and access management
  - c) Virtualization
  - d) All of these
- 2) Which of the following mechanisms are contained by Cloud API for accessing cloud services?
  - a) Abstraction
  - b) Authentication
  - c) Replication
  - d) All of these
- 3) Which of the following object database has the ability to create rich data objects and create relationships between them?
  - a) Presentation Builder
  - b) Business Objects Build
  - c) Business Process Designer
  - d) None of these
- 4) The technology used to distribute service requests to resources is referred to as \_\_\_\_\_.
  - a) Load performing
  - b) Load scheduling
  - c) Load balancing
  - d) All of these
- 5) Which of the following can be considered PaaS offering?
  - a) Google Maps
  - b) Gmail
  - c) Google Earth
  - d) All of these
- 6) Point out the wrong statement.
  - a) A cloud is defined as the combination of the infrastructure of a datacentre with the ability to provision hardware and software
  - b) High touch applications are best done on-premises
  - c) The Google App Engine follows IaaS
  - d) None of the mentioned
- 7) All cloud computing applications suffer from the inherent \_\_\_\_\_ that is intrinsic in their WAN connectivity.
  - a) Propagation
  - b) Latency
  - c) Noise
  - d) All of these



- 8) \_\_\_\_\_ as a utility is a dream that dates from the beginning of the computing industry itself.
- a) Model
  - b) Computing
  - c) Software
  - d) All of these
- 9) Which of the following is essential concept related to Cloud?
- a) Reliability
  - b) Productivity
  - c) Abstraction
  - d) All of these
- 10) \_\_\_\_\_ is a complete operating environment with applications, management and user interface.
- a) IaaS
  - b) SaaS
  - c) PaaS
  - d) All of these
- 11) Point out the correct statement.
- a) Identities are not tied to the concept of accounts and can be used for contacts or "ID cards"
  - b) Identities are important from a reliability standpoint
  - c) Presence is important in cloud computing because it adds context that can modify services and service delivery
  - d) All of the mentioned
- 12) Which of the following standard is the key to creating Single Sign-On (SSO) systems?
- a) OpenID 2.0
  - b) CHAP
  - c) SMAL
  - d) All of these
- 13) Which of the following is required by Cloud Computing?
- a) That you establish an identity
  - b) That the identity be authenticated
  - c) That the authentication be portable
  - d) All of these
- 14) Point out the wrong statement.
- a) You can use proxy and brokerage services to separate clients from direct access to shared cloud storage
  - b) Any distributed application has a much greater attack surface than an application that is closely held on a Local Area Network
  - c) Cloud computing doesn't have vulnerabilities associated with Internet applications
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cloud Computing**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) Draw & illustrate the cloud deployment models?
- b) Explain in detail CloudStack architecture and its compute, storage, networking, and IAM services?
- c) Define IAM. Explain in detail the cloud service provider IAM.
- d) Explain Financial and technological implications of running an application on public cloud.

**Q.3** Explain in detail the designing elastic, highly available and resilient infrastructure using OpenStack w.r.t. private cloud? **08**

**OR**

Explain with example the IaaS, PaaS and SaaS availability management & the role of virtualization?

**Q.4 Attempt any TWO.** **08**

- a) Benefits and Challenges of Cloud Computing.
- b) Characteristics of Private Cloud & its deployment models.
- c) Why Public Cloud, When to opt for Public Cloud?

**Section – II**

**Q.5 Attempt any THREE.** **12**

- a) Explain the security concerns in Traditional IT. Also illustrate the challenges in Cloud Computing in terms of Application Security.
- b) Explain in detail Abuse and Nefarious use of Cloud Computing.
- c) Explain the compliance relation to the cloud computing.
- d) Explain the international laws and regulations for cloud privacy.

**Q.6** Explain with example establishing your Cloud Vision, Buying Cloud Services understanding cloud risk? **08**

**OR**

Explain in detail Selection criteria for cloud deployment, issues/risks in migrating to cloud computing?

**Q.7 Attempt any TWO.** **08**

- a) Migration paths for cloud
- b) Building ROI from Cloud Computing
- c) Security reference model

Seat No.	
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Set Q
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cloud Computing**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ as a utility is a dream that dates from the beginning of the computing industry itself.
 

a) Model	b) Computing
c) Software	d) All of these
- 2) Which of the following is essential concept related to Cloud?
 

a) Reliability	b) Productivity
c) Abstraction	d) All of these
- 3) \_\_\_\_\_ is a complete operating environment with applications, management and user interface.
 

a) IaaS	b) SaaS
c) PaaS	d) All of these
- 4) Point out the correct statement.
 

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- 8) Which of the following is considered an essential element in cloud computing by CSA?
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  - c) Virtualization
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- 9) Which of the following mechanisms are contained by Cloud API for accessing cloud services?
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  - c) Replication
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- 10) Which of the following object database has the ability to create rich data objects and create relationships between them?
- a) Presentation Builder
  - b) Business Objects Build
  - c) Business Process Designer
  - d) None of these
- 11) The technology used to distribute service requests to resources is referred to as \_\_\_\_\_.
- a) Load performing
  - b) Load scheduling
  - c) Load balancing
  - d) All of these
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- a) Google Maps
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- 13) Point out the wrong statement.
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  - b) High touch applications are best done on-premises
  - c) The Google App Engine follows IaaS
  - d) None of the mentioned
- 14) All cloud computing applications suffer from the inherent \_\_\_\_\_ that is intrinsic in their WAN connectivity.
- a) Propagation
  - b) Latency
  - c) Noise
  - d) All of these

Seat No.	
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Set **Q**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cloud Computing**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) Draw & illustrate the cloud deployment models?
- b) Explain in detail CloudStack architecture and its compute, storage, networking, and IAM services?
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- d) Explain Financial and technological implications of running an application on public cloud.

**Q.3** Explain in detail the designing elastic, highly available and resilient infrastructure using OpenStack w.r.t. private cloud? **08**

**OR**

Explain with example the IaaS, PaaS and SaaS availability management & the role of virtualization?

**Q.4 Attempt any TWO.** **08**

- a) Benefits and Challenges of Cloud Computing.
- b) Characteristics of Private Cloud & its deployment models.
- c) Why Public Cloud, When to opt for Public Cloud?

**Section – II**

**Q.5 Attempt any THREE.** **12**

- a) Explain the security concerns in Traditional IT. Also illustrate the challenges in Cloud Computing in terms of Application Security.
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**Q.6** Explain with example establishing your Cloud Vision, Buying Cloud Services understanding cloud risk? **08**

**OR**

Explain in detail Selection criteria for cloud deployment, issues/risks in migrating to cloud computing?

**Q.7 Attempt any TWO.** **08**

- a) Migration paths for cloud
- b) Building ROI from Cloud Computing
- c) Security reference model

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cloud Computing**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Point out the correct statement.
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  - c) Presence is important in cloud computing because it adds context that can modify services and service delivery
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a) OpenID 2.0	b) CHAP
c) SMAL	d) All of these
- 3) Which of the following is required by Cloud Computing?
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  - c) Cloud computing doesn't have vulnerabilities associated with Internet applications
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- 5) Which of the following is considered an essential element in cloud computing by CSA?
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- 8) The technology used to distribute service requests to resources is referred to as \_\_\_\_\_.
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- 9) Which of the following can be considered PaaS offering?
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- 10) Point out the wrong statement.
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- a) IaaS
  - b) SaaS
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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cloud Computing**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) Draw & illustrate the cloud deployment models?
- b) Explain in detail CloudStack architecture and its compute, storage, networking, and IAM services?
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**OR**

Explain with example the IaaS, PaaS and SaaS availability management & the role of virtualization?

**Q.4 Attempt any TWO.** **08**

- a) Benefits and Challenges of Cloud Computing.
- b) Characteristics of Private Cloud & its deployment models.
- c) Why Public Cloud, When to opt for Public Cloud?

**Section – II**

**Q.5 Attempt any THREE.** **12**

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**Q.7 Attempt any TWO.** **08**

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cloud Computing**

Day & Date: Monday, 20-02-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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- 14) Which of the following can be considered PaaS offering?
- a) Google Maps
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  - d) All of these

Seat No.	
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Set **S**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cloud Computing**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any THREE.** **12**

- a) Draw & illustrate the cloud deployment models?
- b) Explain in detail CloudStack architecture and its compute, storage, networking, and IAM services?
- c) Define IAM. Explain in detail the cloud service provider IAM.
- d) Explain Financial and technological implications of running an application on public cloud.

**Q.3** Explain in detail the designing elastic, highly available and resilient infrastructure using OpenStack w.r.t. private cloud? **08**

**OR**

Explain with example the IaaS, PaaS and SaaS availability management & the role of virtualization?

**Q.4 Attempt any TWO.** **08**

- a) Benefits and Challenges of Cloud Computing.
- b) Characteristics of Private Cloud & its deployment models.
- c) Why Public Cloud, When to opt for Public Cloud?

**Section – II**

**Q.5 Attempt any THREE.** **12**

- a) Explain the security concerns in Traditional IT. Also illustrate the challenges in Cloud Computing in terms of Application Security.
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**Q.6** Explain with example establishing your Cloud Vision, Buying Cloud Services understanding cloud risk? **08**

**OR**

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**Q.7 Attempt any TWO.** **08**

- a) Migration paths for cloud
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<b>Seat No.</b>	
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- 7) Find Euclidean distance between two objects.  
O1= (1,2,3,4,5,6,7)  
O2= (2,4,5,7,1,3,6)
- |          |         |
|----------|---------|
| a) 6.63  | b) 0.00 |
| c) 16.00 | d) 4.00 |
- 8) Articles, prepositions are removed this step is \_\_\_\_\_ in logical view.
- |                        |                          |
|------------------------|--------------------------|
| a) Removing stop-words | b) creating noun groups  |
| c) Stemming            | d) structure recognition |
- 9) While searching keywords in \_\_\_\_\_ retrieval small errors are likely to go unnoticed.
- |               |                |
|---------------|----------------|
| a) Multimedia | b) Information |
| c) data       | d) all         |
- 10) Prefix Value for **a (underlined)** in pattern ababaca is \_\_\_\_\_.
- |      |      |
|------|------|
| a) 0 | b) 1 |
| c) 2 | d) 3 |
- 11) \_\_\_\_\_ indexing structure takes sampling of words instead of complete words to reduce space and external accesses.
- |                   |                 |
|-------------------|-----------------|
| a) inverted index | b) suffix array |
| c) suffix tree    | d) supra-index  |
- 12) Drawback of crawler-indexer architecture is problem in gathering data due to \_\_\_\_\_.
- |                                  |                        |
|----------------------------------|------------------------|
| a) Highly dynamic data           | b) High load at server |
| c) Saturated communication links | d) All of the above    |
- 13) In \_\_\_\_\_ algorithm Match and occurrence heuristic combined while sequential searching.
- |        |             |
|--------|-------------|
| a) KMP | b) BM       |
| c) BDM | d) Shift-Or |
- 14) Which of the following is not a component of a search engine?
- |                                  |                               |
|----------------------------------|-------------------------------|
| a) Spider                        | b) Index                      |
| c) Search of retrieval mechanism | d) Natural language technique |

Seat No.	
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Set	P
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Retrieval**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.  
 3) Assume appropriate data if necessary.

**Section – I**

**Q.2 Attempt any Three**

**12**

- Which words will be retrieved from the given set allowing edit distance of 2? Justify the answer.
  - Words = {pink, pinky, panthor, patt, prank}
  - Entered word = pank
- Define Information Retrieval Model. Define ranking function for three classic text retrieval models.
- Define pattern and explain different patterns used for matching with example.
- Explain how queries are expanded with vector model using user relevance feedback.

**Q.3 Attempt any one**

**08**

- Explain steps of document preprocessing with neat diagram.
- Suppose you have a collection of 50 documents, of which you know 10 are relevant to a specific query Q. Consider the following results from a search of this collection using this query Q, which retrieved a total of 30 documents. Calculate Precision and Recall and plot a graph. Dot indicates relevant documents

• Doc1	Doc11	• Doc21
Doc2	Doc12	Doc22
Doc3	Doc13	• Doc23
• Doc4	• Doc14	Doc24
Doc5	Doc15	Doc25
Doc6	Doc16	Doc26
Doc7	Doc17	Doc27
Doc8	Doc18	• Doc28
• Doc9	• Doc19	Doc29
Doc 10	Doc20	Doc30

- Q.4** Find Logical View for each document using full text and Create weight vectors using vector model. **08**

D1: You say goodbye, I say hello

D2: You say stop, I say go

D3: Hello, hello, you say goodbye

D4: I say high, you say low

### Section – II

- Q.5 Attempt any three** **12**

- Create suffix Trie and suffix tree for following words  
cup, cat, captain, casserole, dog, goat, duck
- Define crawler. Explain different techniques used in crawling.
- Find the occurrences of pattern in the text using BM algorithm. Show stepwise result.  
Text: aabababacba                      Pattern: abbab
- What do you mean by Ranking? Explain ranking algorithm used by Google search engine.

- Q.6 Attempt any one** **08**

- Explain MULTOS model in detail with example. How image data is dealt in MULTOS model.
- Bit masks for words are

data : 0000 0000 0000 0010 0000

base : 0000 0001 0000 0000 0000

management : 0000 1000 0000 0000 0000

system : 0000 0000 0000 0000 1000

software : 1000 0000 0000 0000 0000

Construct signature file for the following text:

Data base management system is used to manage data base. This System is software for storing and retrieving users' data by considering appropriate data.

Find search results for following queries using constructed signature file:

- data base management
- software

- Q.7 Construct inverted index file using word position.** **08**

Doc1: A query is a formulation of a user information need. In its simplest form, a query is composed of keywords and the documents containing such keywords are searched for.

Doc2: Information retrieval (IR) is the activity of obtaining information system resources that are relevant to an information need from a collection of those resources.

Which documents will be retrieved for the query: Information need (as Phrase)?

Seat No.	
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Retrieval**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Articles, prepositions are removed this step is \_\_\_\_\_ in logical view.
  - a) Removing stop-words
  - b) creating noun groups
  - c) Stemming
  - d) structure recognition
- 2) While searching keywords in \_\_\_\_\_ retrieval small errors are likely to go unnoticed.
  - a) Multimedia
  - b) Information
  - c) data
  - d) all
- 3) Prefix Value for **a (underlined)** in pattern ababaca is \_\_\_\_\_.
  - a) 0
  - b) 1
  - c) 2
  - d) 3
- 4) \_\_\_\_\_ indexing structure takes sampling of words instead of complete words to reduce space and external accesses.
  - a) inverted index
  - b) suffix array
  - c) suffix tree
  - d) supra-index
- 5) Drawback of crawler-indexer architecture is problem in gathering data due to \_\_\_\_\_.
  - a) Highly dynamic data
  - b) High load at server
  - c) Saturated communication links
  - d) All of the above
- 6) In \_\_\_\_\_ algorithm Match and occurrence heuristic combined while sequential searching.
  - a) KMP
  - b) BM
  - c) BDM
  - d) Shift-Or
- 7) Which of the following is not a component of a search engine?
  - a) Spider
  - b) Index
  - c) Search of retrieval mechanism
  - d) Natural language technique



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Set	Q
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Retrieval**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.  
 3) Assume appropriate data if necessary.

**Section – I**

**Q.2 Attempt any Three**

**12**

- Which words will be retrieved from the given set allowing edit distance of 2? Justify the answer.
  - Words = {pink, pinky, panthor, patt, prank}
  - Entered word = pank
- Define Information Retrieval Model. Define ranking function for three classic text retrieval models.
- Define pattern and explain different patterns used for matching with example.
- Explain how queries are expanded with vector model using user relevance feedback.

**Q.3 Attempt any one**

**08**

- Explain steps of document preprocessing with neat diagram.
- Suppose you have a collection of 50 documents, of which you know 10 are relevant to a specific query Q. Consider the following results from a search of this collection using this query Q, which retrieved a total of 30 documents. Calculate Precision and Recall and plot a graph. Dot indicates relevant documents

• Doc1	Doc11	• Doc21
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Doc7	Doc17	Doc27
Doc8	Doc18	• Doc28
• Doc9	• Doc19	Doc29
Doc 10	Doc20	Doc30

**Q.4** Find Logical View for each document using full text and Create weight vectors using vector model. **08**

D1: You say goodbye, I say hello

D2: You say stop, I say go

D3: Hello, hello, you say goodbye

D4: I say high, you say low

### Section – II

**Q.5 Attempt any three** **12**

- Create suffix Trie and suffix tree for following words  
cup, cat, captain, casserole, dog, goat, duck
- Define crawler. Explain different techniques used in crawling.
- Find the occurrences of pattern in the text using BM algorithm. Show stepwise result.  
Text: aabababacba Pattern: abbab
- What do you mean by Ranking? Explain ranking algorithm used by Google search engine.

**Q.6 Attempt any one** **08**

- Explain MULTOS model in detail with example. How image data is dealt in MULTOS model.
- Bit masks for words are

data : 0000 0000 0000 0010 0000

base : 0000 0001 0000 0000 0000

management : 0000 1000 0000 0000 0000

system : 0000 0000 0000 0000 1000

software : 1000 0000 0000 0000 0000

Construct signature file for the following text:

Data base management system is used to manage data base. This System is software for storing and retrieving users' data by considering appropriate data.

Find search results for following queries using constructed signature file:

- data base management
- software

**Q.7 Construct inverted index file using word position.** **08**

Doc1: A query is a formulation of a user information need. In its simplest form, a query is composed of keywords and the documents containing such keywords are searched for.

Doc2: Information retrieval (IR) is the activity of obtaining information system resources that are relevant to an information need from a collection of those resources.

Which documents will be retrieved for the query: Information need (as Phrase)?

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Set	R
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Retrieval**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.  
 3) Assume appropriate data if necessary.

**Section – I**

**Q.2 Attempt any Three**

**12**

- Which words will be retrieved from the given set allowing edit distance of 2? Justify the answer.
  - Words = {pink, pinky, panthor, patt, prank}
  - Entered word = pank
- Define Information Retrieval Model. Define ranking function for three classic text retrieval models.
- Define pattern and explain different patterns used for matching with example.
- Explain how queries are expanded with vector model using user relevance feedback.

**Q.3 Attempt any one**

**08**

- Explain steps of document preprocessing with neat diagram.
- Suppose you have a collection of 50 documents, of which you know 10 are relevant to a specific query Q. Consider the following results from a search of this collection using this query Q, which retrieved a total of 30 documents. Calculate Precision and Recall and plot a graph. Dot indicates relevant documents

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Doc5	Doc15	Doc25
Doc6	Doc16	Doc26
Doc7	Doc17	Doc27
Doc8	Doc18	• Doc28
• Doc9	• Doc19	Doc29
Doc 10	Doc20	Doc30

- Q.4** Find Logical View for each document using full text and Create weight vectors using vector model. **08**

D1: You say goodbye, I say hello

D2: You say stop, I say go

D3: Hello, hello, you say goodbye

D4: I say high, you say low

### Section – II

- Q.5 Attempt any three** **12**

- Create suffix Trie and suffix tree for following words  
cup, cat, captain, casserole, dog, goat, duck
- Define crawler. Explain different techniques used in crawling.
- Find the occurrences of pattern in the text using BM algorithm. Show stepwise result.  
Text: aabababacba                      Pattern: abbab
- What do you mean by Ranking? Explain ranking algorithm used by Google search engine.

- Q.6 Attempt any one** **08**

- Explain MULTOS model in detail with example. How image data is dealt in MULTOS model.
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- data base management
- software

- Q.7 Construct inverted index file using word position.** **08**

Doc1: A query is a formulation of a user information need. In its simplest form, a query is composed of keywords and the documents containing such keywords are searched for.

Doc2: Information retrieval (IR) is the activity of obtaining information system resources that are relevant to an information need from a collection of those resources.

Which documents will be retrieved for the query: Information need (as Phrase)?

Seat No.	
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Set	S
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Retrieval**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Exact match retrieval is same as \_\_\_\_\_.  
 a) Attribute predicate                      b) structural predicate  
 c) semantic predicate                      d) none of these
- 2) Find Euclidean distance between two objects.  
 O1= (1,2,3,4,5,6,7)  
 O2= (2,4,5,7,1,3,6)  
 a) 6.63    b) 0.00  
 c) 16.00    d) 4.00
- 3) Articles, prepositions are removed this step is \_\_\_\_\_ in logical view.  
 a) Removing stop-words                      b) creating noun groups  
 c) Stemming                                      d) structure recognition
- 4) While searching keywords in \_\_\_\_\_ retrieval small errors are likely to go unnoticed.  
 a) Multimedia                                      b) Information  
 c) data    d) all
- 5) Prefix Value for **a (underlined)** in pattern ababaca is \_\_\_\_\_.  
 a) 0    b) 1  
 c) 2    d) 3
- 6) \_\_\_\_\_ indexing structure takes sampling of words instead of complete words to reduce space and external accesses.  
 a) inverted index                                      b) suffix array  
 c) suffix tree    d) supra-index
- 7) Drawback of crawler-indexer architecture is problem in gathering data due to \_\_\_\_\_.  
 a) Highly dynamic data                      b) High load at server  
 c) Saturated communication links      d) All of the above
- 8) In \_\_\_\_\_ algorithm Match and occurrence heuristic combined while sequential searching.  
 a) KMP    b) BM  
 c) BDM    d) Shift-Or



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Set	S
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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Information Retrieval**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.  
 3) Assume appropriate data if necessary.

**Section – I**

**Q.2 Attempt any Three**

**12**

- Which words will be retrieved from the given set allowing edit distance of 2? Justify the answer.
  - Words = {pink, pinky, panthor, patt, prank}
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Doc6	Doc16	Doc26
Doc7	Doc17	Doc27
Doc8	Doc18	• Doc28
• Doc9	• Doc19	Doc29
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- Q.4** Find Logical View for each document using full text and Create weight vectors using vector model. **08**

D1: You say goodbye, I say hello

D2: You say stop, I say go

D3: Hello, hello, you say goodbye

D4: I say high, you say low

## Section – II

- Q.5 Attempt any three** **12**

- Create suffix Trie and suffix tree for following words  
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- Define crawler. Explain different techniques used in crawling.
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- Q.6 Attempt any one** **08**

- Explain MULTOS model in detail with example. How image data is dealt in MULTOS model.
- Bit masks for words are

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Find search results for following queries using constructed signature file:

- data base management
- software

- Q.7 Construct inverted index file using word position.** **08**

Doc1: A query is a formulation of a user information need. In its simplest form, a query is composed of keywords and the documents containing such keywords are searched for.

Doc2: Information retrieval (IR) is the activity of obtaining information system resources that are relevant to an information need from a collection of those resources.

Which documents will be retrieved for the query: Information need (as Phrase)?

<b>Seat No.</b>	
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Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

## Marks:14

14

- Page 1 of 16

- 8) What is the main purpose of reactance diagram?
- a) Load flow analysis
  - b) Fault analysis
  - c) Calculation of ratings of Alternators Transformers
  - d) Calculation of rating of
- 9) A 3-ph system is called balanced, when it consists of ---
- a) Zero and Negative sequence current only
  - b) Negative and Positive sequence current only
  - c) Positive sequence current only
  - d) Zero sequence current only
- 10) The line currents in a 3-ph unbalanced load are  $I_a = 4 + j6$ ,  $I_b = 2 - j2$  and  $I_c = -3 + j2$  then zero sequence component of current will be
- a)  $3 + j6$
  - b)  $9 + j10$
  - c)  $1 + j2$
  - d)  $3 - j6$
- 11) What do you mean by fault level?
- a) Fault Current
  - b) Fault MVA
  - c) Fault Power Factor
  - d) Voltage at fault point
- 12) The magnitude of fault current depends upon
- a) Total impedance up to fault
  - b) Voltage at the fault
  - c) Load current supplied before fault
  - d) a and b both
- 13) Transient stability can be improved by
- a) Introducing series reactance
  - b) Introducing series capacitance
  - c) Both a and b
  - d) None of the above
- 14) The plot between power angle and time is ----
- a) Swing curve
  - b) Power curve
  - c) Critical clearing angle
  - d) Time curve

Seat  
No.Set **P**

**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System - III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

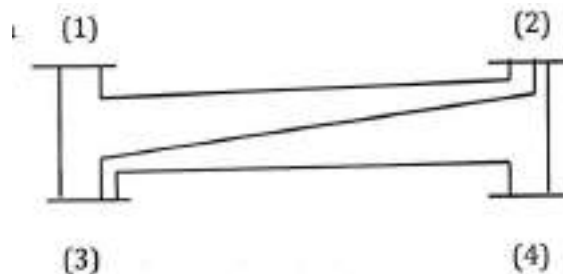
**Section – I**

**Q.2 Solve any Four of the following.**

16

- a) Express the representation of transformer model in per unit system  
 b) Form the  $Y_{bus}$  for given data

Line	R	X
1-2	0.05	0.15
1-3	0.10	0.20
2-3	0.15	0.30
2-4	0.05	0.25
3-4	0.10	0.35



- c) Explain with sequence network various open circuit faults on the power system.  
 d) A 25 MVA, 13.2 kV alternators with solidly grounded neutral has a sub transient reactance of 0.25 p.u. The negative and zero sequence reactance's are 0.35 and 0.1 p.u. respectively. A single line to ground fault occurs at the terminals of an Unloaded alternator; determine the fault current and the line-to-line voltages. Neglect resistance.  
 e) Explain with suitable example how admittance matrix is derived  
 f) Explain per unit representation of 3-ph supply system.

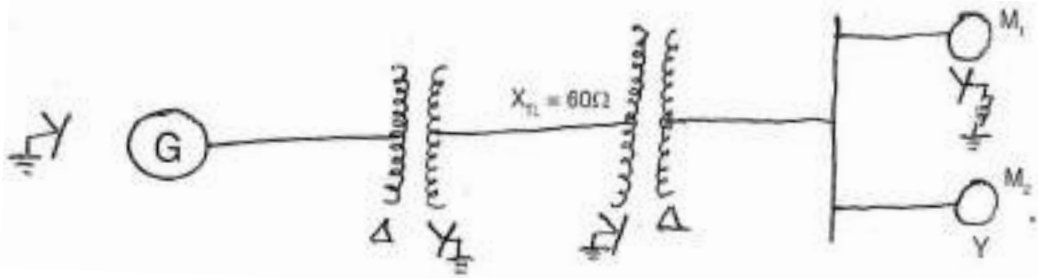
**Q.3 Solve any Two of the following.**

12

- a) Explain in detail the computational procedure for load flow solution using N-R method when system contains all type buses.  
 b) For a power system the system data for load flow solution is as below. Determine the voltages at the end of first iteration using Gauss-Seidel method. ( $\alpha = 1.6$ )

Bus	Admittance	Bus	P	Q	V	Remark
1 - 2	2 - j8.0	1	--	--	1.06	Slack
1 - 3	1 - j4.0	2	0.5	0.2	--	PQ
2 - 3	0.66 - j0.66	3	0.4	0.3	--	PQ
2 - 4	1-j4.0	4	0.3	0.1	--	PQ
3 - 4	2 - j8.0					

- c) Draw the reactance diagram for the system shown in figure. Where component ratings are given as G: 20 MVA, 6.6 kV,  $X'' = 12\%$ ,  $T_1$ : 20 MVA, 6.6 kV/66kV,  $x = 08\%$ ,  $T_2$ : 66/6.6kV,  $X = 08\%$ ,  $M_1$  and  $M_2 = 5$  MVA, 6.6kV,  $X'' = 20\%$ ,  $X_{TL} = j60 \text{ Ohms}$ .



### Section - II

#### Q.4 Solve Any Three of the following.

12

- Explain the terms
  - Swing curve
  - Critical clearing time
- Derive an expression for the system for line to line fault on generator.
- Derive an expression for symmetrical components in terms of phase voltages.
- Compare symmetrical and unsymmetrical faults

#### Q.5 Solve Any Two of the following.

16

- Derive an expression with sequence network of the system for
  - L-L fault on generator
  - L-L-G fault on generator
- Derive an expression for load flow analysis by Gauss-Seidal method.
- A salient pole synchronous machine having  $X_d = 0.6 \text{ P.U.}$  and  $X_q = 0.4 \text{ P.U.}$  per phase, is operated from an infinite bus of voltage 1 P.U. if the excitation voltage is 1.1 P.U. find the steady state stability limit and the angle at which it occurs.

Seat No.	
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Set Q
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**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System - III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What is the main purpose of reactance diagram?
  - a) Load flow analysis
  - b) Fault analysis
  - c) Calculation of ratings of Alternators Transformers
  - d) Calculation of rating of
- 2) A 3-ph system is called balanced, when it consists of ---
  - a) Zero and Negative sequence current only
  - b) Negative and Positive sequence current only
  - c) Positive sequence current only
  - d) Zero sequence current only
- 3) The line currents in a 3-ph unbalanced load are  $I_a = 4 + j6$ ,  $I_b = 2 - j2$  and  $I_c = -3 + j2$  then zero sequence component of current will be
 

a) $3 + j6$	b) $9 + j10$
c) $1 + j2$	d) $3 - j6$
- 4) What do you mean by fault level?
 

a) Fault Current	b) Fault MVA
c) Fault Power Factor	d) Voltage at fault point
- 5) The magnitude of fault current depends upon
  - a) Total impedance up to fault
  - b) Voltage at the fault
  - c) Load current supplied before fault
  - d) a and b both
- 6) Transient stability can be improved by
 

a) Introducing series reactance	b) Introducing series capacitance
c) Both a and b	d) None of the above
- 7) The plot between power angle and time is ----
 

a) Swing curve	b) Power curve
c) Critical clearing angle	d) Time curve



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Seat  
No.Set **Q**

**T.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System - III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

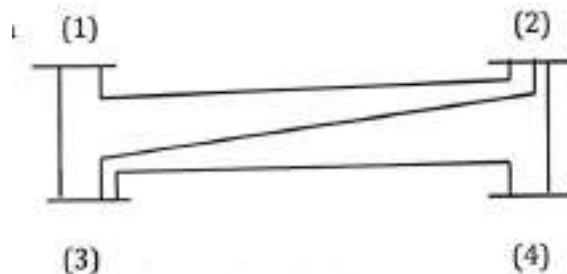
**Section – I**

**Q.2 Solve any Four of the following.**

**16**

- a) Express the representation of transformer model in per unit system  
 b) Form the  $Y_{bus}$  for given data

Line	R	X
1-2	0.05	0.15
1-3	0.10	0.20
2-3	0.15	0.30
2-4	0.05	0.25
3-4	0.10	0.35



- c) Explain with sequence network various open circuit faults on the power system.  
 d) A 25 MVA, 13.2 kV alternators with solidly grounded neutral has a sub transient reactance of 0.25 p.u. The negative and zero sequence reactance's are 0.35 and 0.1 p.u. respectively. A single line to ground fault occurs at the terminals of an Unloaded alternator; determine the fault current and the line-to-line voltages. Neglect resistance.  
 e) Explain with suitable example how admittance matrix is derived  
 f) Explain per unit representation of 3-ph supply system.

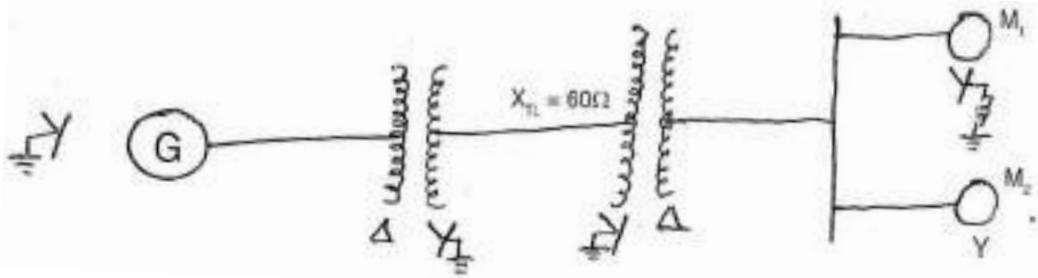
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**12**

- a) Explain in detail the computational procedure for load flow solution using N-R method when system contains all type buses.  
 b) For a power system the system data for load flow solution is as below. Determine the voltages at the end of first iteration using Gauss-Seidel method. ( $\alpha = 1.6$ )

Bus	Admittance	Bus	P	Q	V	Remark
1 - 2	2 - j8.0	1	--	--	1.06	Slack
1 - 3	1 - j4.0	2	0.5	0.2	--	PQ
2 - 3	0.66 - j0.66	3	0.4	0.3	--	PQ
2 - 4	1-j4.0	4	0.3	0.1	--	PQ
3 - 4	2 - j8.0					

- c) Draw the reactance diagram for the system shown in figure. Where component ratings are given as G: 20 MVA, 6.6 kV,  $X'' = 12\%$ ,  $T_1$ : 20 MVA, 6.6 kV/66kV,  $x = 08\%$ ,  $T_2$ : 66/6.6kV,  $X = 08\%$ ,  $M_1$  and  $M_2 = 5$  MVA, 6.6kV,  $X'' = 20\%$ ,  $X_{TL} = j60 \text{ Ohms}$ .



### Section - II

#### Q.4 Solve Any Three of the following.

12

- Explain the terms
  - Swing curve
  - Critical clearing time
- Derive an expression for the system for line to line fault on generator.
- Derive an expression for symmetrical components in terms of phase voltages.
- Compare symmetrical and unsymmetrical faults

#### Q.5 Solve Any Two of the following.

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- Derive an expression with sequence network of the system for
  - L-L fault on generator
  - L-L-G fault on generator
- Derive an expression for load flow analysis by Gauss-Seidal method.
- A salient pole synchronous machine having  $X_d = 0.6 \text{ P.U.}$  and  $X_q = 0.4 \text{ P.U.}$  per phase, is operated from an infinite bus of voltage 1 P.U. if the excitation voltage is 1.1 P.U. find the steady state stability limit and the angle at which it occurs.

Seat No.	
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Set	R
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What do you mean by fault level?
  - a) Fault Current
  - b) Fault MVA
  - c) Fault Power Factor
  - d) Voltage at fault point
- 2) The magnitude of fault current depends upon
  - a) Total impedance up to fault
  - b) Voltage at the fault
  - c) Load current supplied before fault
  - d) a and b both
- 3) Transient stability can be improved by
  - a) Introducing series reactance
  - b) Introducing series capacitance
  - c) Both a and b
  - d) None of the above
- 4) The plot between power angle and time is ----
  - a) Swing curve
  - b) Power curve
  - c) Critical clearing angle
  - d) Time curve
- 5) In an L-L-G fault the negative and zero sequence networks are connected in \_\_\_\_\_.
  - a) Series
  - b) Parallel
  - c) Not connected
  - d) None of the above
- 6) Which of the following options represents symmetrical fault?
  - a) Line to Line fault
  - b) Phase to Phase fault
  - c) 3-Ph short circuit Fault
  - d) L-G G Fault
- 7) % reactance of a 100kVA, 5kV, 5 Ohm reactance is
  - a) 2%
  - b) 20%
  - c) 100%
  - d) 1%
- 8) On which among the following factors does the magnitude of the fault current depends
  - a) Total impedance up to the faults
  - b) Voltage at the fault point
  - c) Both a and b
  - d) None of these

- 9) Which of the following faults is more frequently occurring in power system?
- |                 |                   |
|-----------------|-------------------|
| a) Symmetrical  | b) External       |
| c) Line to Line | d) Line to Ground |
- 10) What will be the base impedance for a 10kV, 10MVA 3-Ph System?
- |                 |             |
|-----------------|-------------|
| a) 7 Ohms       | b) 10 Ohms  |
| c) 01 kilo Ohms | d) 100 Ohms |
- 11) Which of the following formula is correct?
- |                                     |                        |
|-------------------------------------|------------------------|
| a) $kVA = \sqrt{(kW)^2 + (kVAR)^2}$ | b) $kW = kVA \cos\phi$ |
| c) $kVAR = kVA \sin\phi$            | d) All above           |
- 12) What is the main purpose of reactance diagram?
- |   |
|---|
| a) Load flow analysis                                 |
| b) Fault analysis                                     |
| c) Calculation of ratings of Alternators Transformers |
| d) Calculation of rating of                           |
- 13) A 3-ph system is called balanced, when it consists of ---
- |  |
|--|
| a) Zero and Negative sequence current only     |
| b) Negative and Positive sequence current only |
| c) Positive sequence current only              |
| d) Zero sequence current only                  |
- 14) The line currents in a 3-ph unbalanced load are  $I_a = 4 + j6$ ,  $I_b = 2 - j2$  and  $I_c = -3 + j2$  then zero sequence component of current will be
- |             |              |
|-------------|--------------|
| a) $3 + j6$ | b) $9 + j10$ |
| c) $1 + j2$ | d) $3 - j6$  |

Seat  
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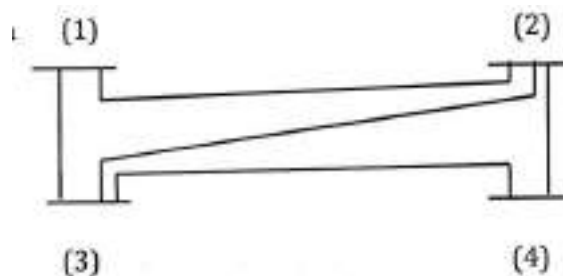
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- a) Express the representation of transformer model in per unit system  
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 d) A 25 MVA, 13.2 kV alternators with solidly grounded neutral has a sub transient reactance of 0.25 p.u. The negative and zero sequence reactance's are 0.35 and 0.1 p.u. respectively. A single line to ground fault occurs at the terminals of an Unloaded alternator; determine the fault current and the line-to-line voltages. Neglect resistance.  
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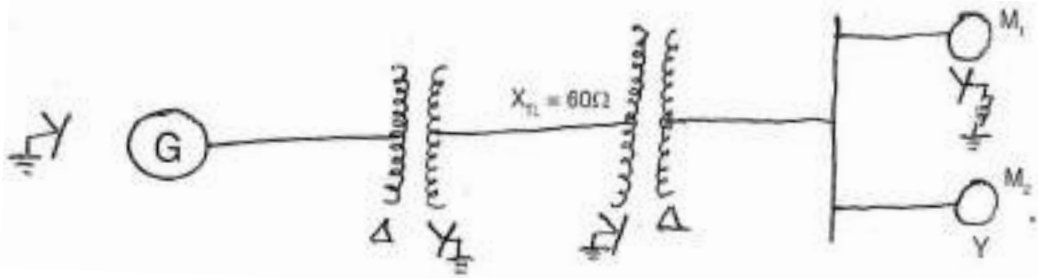
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### Section - II

#### Q.4 Solve Any Three of the following.

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Seat No.	
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  - c) Both a and b
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Seat  
No.Set **S**

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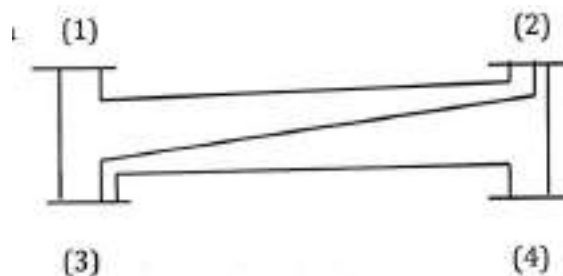
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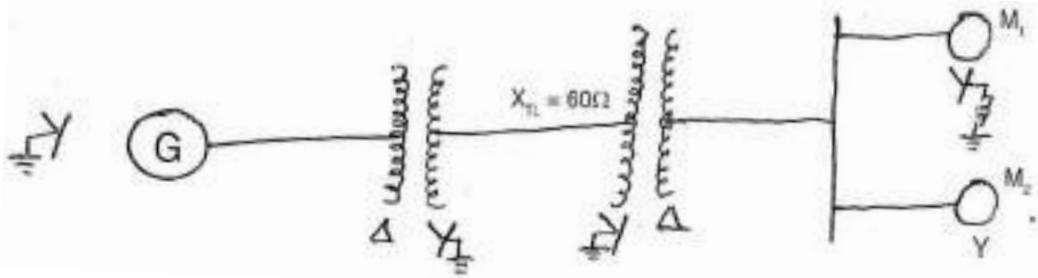
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**P**

- 9) The position and velocity errors of a type-2 system are \_\_\_\_\_.  
a) constant, constant                      b) constant, infinity  
c) zero, constant                            d) zero, zero
- 10) Velocity error constant of a system is measured when the input to the system is unit \_\_\_\_\_ function.  
a) parabolic                                      b) ramp  
c) impulse                                        d) step
- 11) Which of the following is the best method for determining the stability & transient response?  
a) Root locus                                      b) Bode plot  
c) Nyquist plot                                    d) None of the above
- 12) Phase margin of a system is used to specify which of the following?  
a) Frequency response                        b) Absolute stability  
c) Relative stability                            d) Time response
- 13) In case of type-1 system steady state acceleration is \_\_\_\_\_.  
a) unity    b) infinity  
c) zero    d) 10
- 14) \_\_\_\_\_ technique gives quick transient and stability response.  
a) Root locus                                      b) Bode  
c) Nyquist    d) Nichols

Seat No.	
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**Linear Control System**

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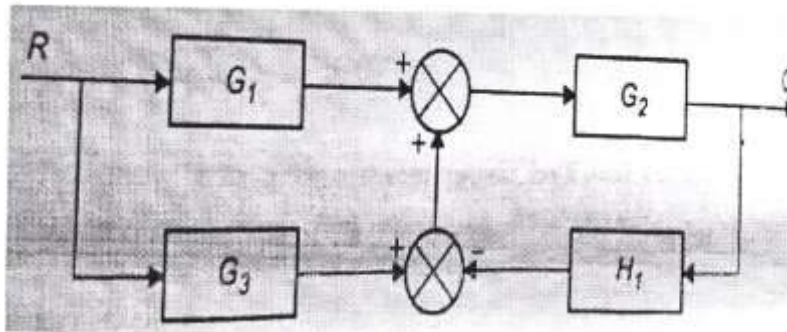
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**Section – I**

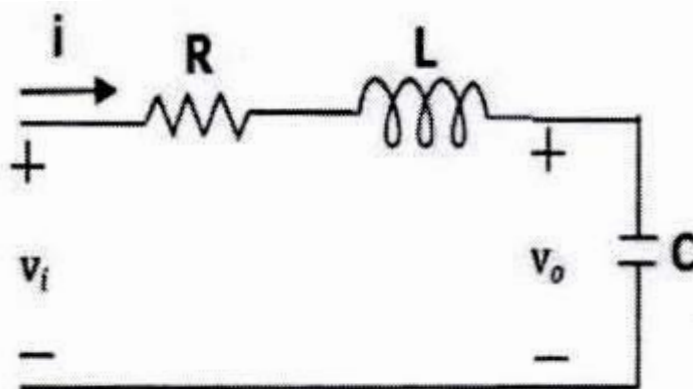
**Q.2 Solve any four.**

**16**

a) Using block diagram reduction technique, find the Transfer function.

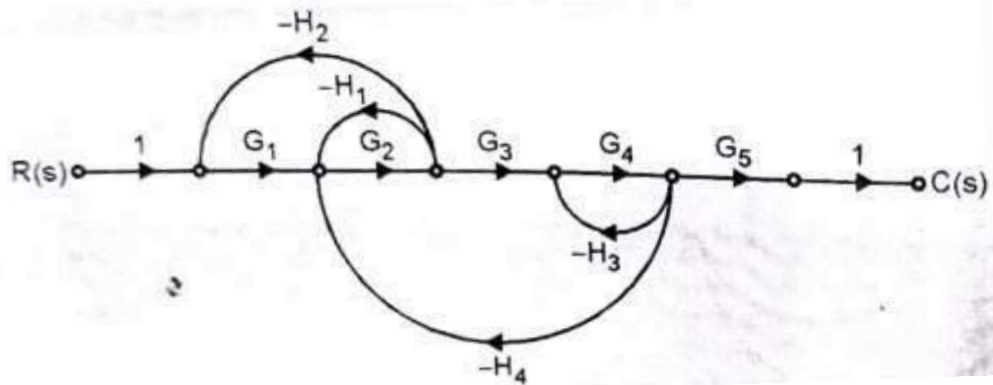


- b) Explain the sensitivity of the control system. Derive it for open loop control system.
- c) Derive the expression for transfer function of simple feedback system.
- d) Explain terminologies used in signal flow graph.
- e) Define transfer function. Find the transfer function of below system.

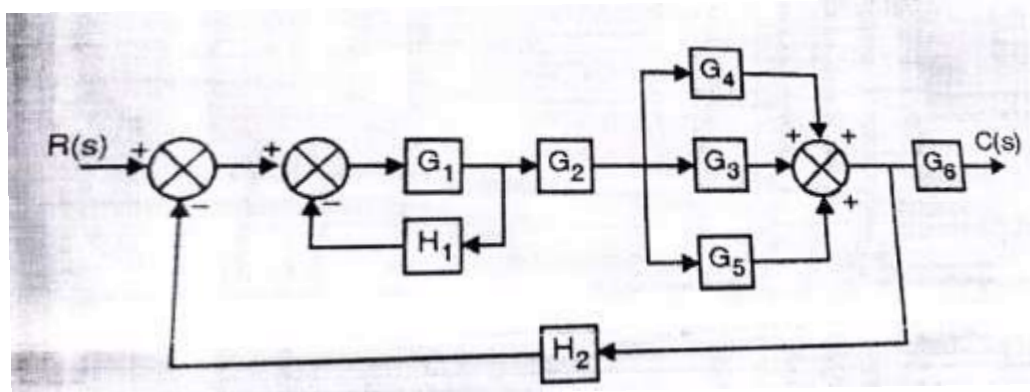


**Q.3 Solve any two.**

- a) By using Mason's Gain formula find the transfer function of the system below



- b) Explain Force Voltage (F-V) Analogy with neat diagram.  
c) Derive the transfer function of the system shown below.

**Section – II****Q.4 Solve Any Four.**

16

- a) Explain the Angle criteria and magnitude criteria for root locus.  
b) Define The following terms.  
1) Phase margin  
2) Phase cross over frequency  
3) Gain margin  
4) gain cross over frequency  
c) A second order system is given by  $\frac{C(s)}{R(s)} = \frac{25}{s^2 + 5s + 25}$   
Find damping factor, damped frequency of oscillations.  
d) Determine the stability of the system having characteristic equation as  $s^3 + 6s^2 + 12s + 8 = 0$   
e) What are the different types of controllers?

**Q.5 Solve Any Two.**

12

- a) Draw the root locus for the unity feedback system with  
$$G(s) = \frac{k}{s(s+1)(s+3)}$$
  
comment on stability.

- b)** A unity feedback system has  $G(s) = \frac{2(s+3)}{(s+1)(s+6)}$

Determine:

- 1) Type of system
- 2) All error constants
- 3) Steady state Error Error when subjected to a step of magnitude '2'

- c)** Construct The Bode Plot For The System Below.

Determine:

- 1) Gain crossover frequency
- 2) The phase crossover frequency
- 3) Gain margin
- 4) Phase margin

$$G(S)H(S) = \frac{10}{s(1 + s)(10 + s)}$$



Seat No.	
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Set **Q**

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

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**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The type 2 system has \_\_\_\_\_ at the origin.
  - a) no net pole
  - b) net pole
  - c) simple pole
  - d) two poles
- 2) The position and velocity errors of a type-2 system are \_\_\_\_\_.
  - a) constant, constant
  - b) constant, infinity
  - c) zero, constant
  - d) zero, zero
- 3) Velocity error constant of a system is measured when the input to the system is unit \_\_\_\_\_ function.
  - a) parabolic
  - b) ramp
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  - d) step
- 4) Which of the following is the best method for determining the stability & transient response?
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- 5) Phase margin of a system is used to specify which of the following?
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  - c) Relative stability
  - d) Time response
- 6) In case of type-1 system steady state acceleration is \_\_\_\_\_.
  - a) unity
  - b) infinity
  - c) zero
  - d) 10
- 7) \_\_\_\_\_ technique gives quick transient and stability response.
  - a) Root locus
  - b) Bode
  - c) Nyquist
  - d) Nichols
- 8) The transient response of a system is mainly due to \_\_\_\_\_.
  - a) inertia forces
  - b) internal forces
  - c) stored energy
  - d) friction
- 9) \_\_\_\_\_ signal will become zero when the feedback signal and reference signs are equal.
  - a) Input
  - b) Actuating
  - c) Feedback
  - d) Reference

- 10)** The transfer function is applicable to which of the following?
- a) Linear and time-invariant systems
  - b) Linear and time-variant systems
  - c) Linear systems
  - d) Non-linear systems
  - e) None of the above
- 11)** With feedback \_\_\_\_\_ increases.
- a) system stability
  - b) sensitivity
  - c) gain
  - d) effects of disturbing signals
- 12)** By which of the following the system response can be tested better?
- a) Ramp input signal
  - b) Sinusoidal input signal
  - c) Unit impulse input signal
  - d) Exponentially decaying signal
- 13)** Spring constant in force-voltage analogy is analogous to \_\_\_\_\_.
- a) capacitance
  - b) reciprocal of capacitance
  - c) current
  - d) resistance
- 14)** Static error co-efficients are used as a measure of the effectiveness of closed loop systems for specified \_\_\_\_\_ input signal.
- a) acceleration
  - b) velocity
  - c) position
  - d) all of the above

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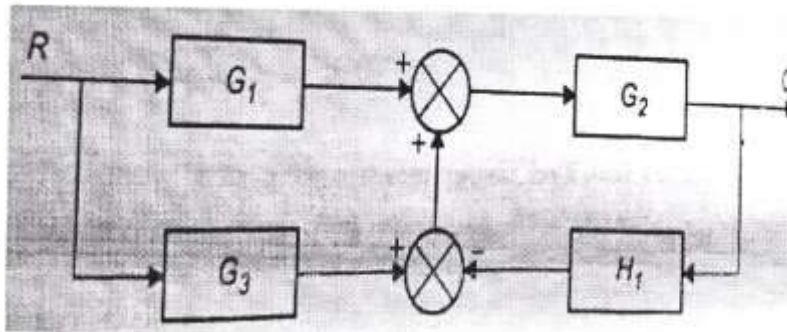
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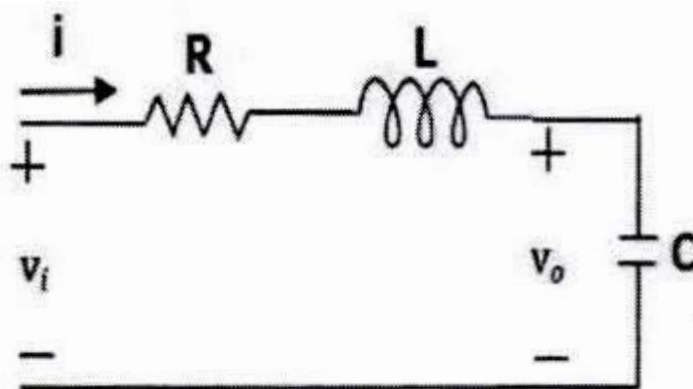
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**Q.2 Solve any four.****16**

a) Using block diagram reduction technique, find the Transfer function.

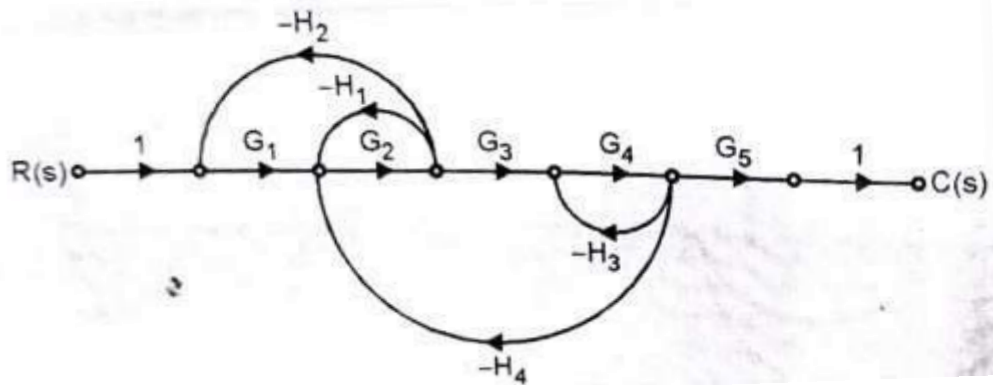


- b) Explain the sensitivity of the control system. Derive it for open loop control system.  
 c) Derive the expression for transfer function of simple feedback system.  
 d) Explain terminologies used in signal flow graph.  
 e) Define transfer function. Find the transfer function of below system.

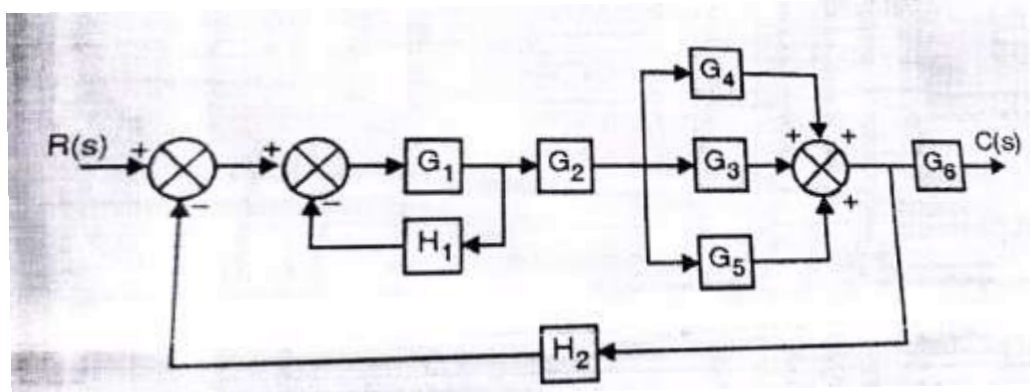


**Q.3 Solve any two.**

- a) By using Mason's Gain formula find the transfer function of the system below



- b) Explain Force Voltage (F-V) Analogy with neat diagram.  
c) Derive the transfer function of the system shown below.

**Section – II****Q.4 Solve Any Four.**

16

- a) Explain the Angle criteria and magnitude criteria for root locus.  
b) Define The following terms.  
1) Phase margin  
2) Phase cross over frequency  
3) Gain margin  
4) gain cross over frequency  
c) A second order system is given by  $\frac{C(s)}{R(s)} = \frac{25}{s^2 + 5s + 25}$   
Find damping factor, damped frequency of oscillations.  
d) Determine the stability of the system having characteristic equation as  $s^3 + 6s^2 + 12s + 8 = 0$   
e) What are the different types of controllers?

**Q.5 Solve Any Two.**

12

- a) Draw the root locus for the unity feedback system with  
 $G(s) = \frac{k}{s(s+1)(s+3)}$   
comment on stability.

- b)** A unity feedback system has  $G(s) = \frac{2(s+3)}{(s+1)(s+6)}$

Determine:

- 1) Type of system
- 2) All error constants
- 3) Steady state Error Error when subjected to a step of magnitude '2'

- c)** Construct The Bode Plot For The System Below.

Determine:

- 1) Gain crossover frequency
- 2) The phase crossover frequency
- 3) Gain margin
- 4) Phase margin

$$G(S)H(S) = \frac{10}{s(1 + s)(10 + s)}$$

Seat No.	
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is the best method for determining the stability & transient response?
 

a) Root locus	b) Bode plot
c) Nyquist plot	d) None of the above
- 2) Phase margin of a system is used to specify which of the following?
 

a) Frequency response	b) Absolute stability
c) Relative stability	d) Time response
- 3) In case of type-1 system steady state acceleration is \_\_\_\_\_.
 

a) unity	b) infinity
c) zero	d) 10
- 4) \_\_\_\_\_ technique gives quick transient and stability response.
 

a) Root locus	b) Bode
c) Nyquist	d) Nichols
- 5) The transient response of a system is mainly due to \_\_\_\_\_.
 

a) inertia forces	b) internal forces
c) stored energy	d) friction
- 6) \_\_\_\_\_ signal will become zero when the feedback signal and reference signs are equal.
 

a) Input	b) Actuating
c) Feedback	d) Reference
- 7) The transfer function is applicable to which of the following?
 

a) Linear and time-invariant systems
b) Linear and time-variant systems
c) Linear systems
d) Non-linear systems
e) None of the above
- 8) With feedback \_\_\_\_\_ increases.
 

a) system stability	b) sensitivity
c) gain	d) effects of disturbing signals

- 9) By which of the following the system response can be tested better?
- a) Ramp input signal
  - b) Sinusoidal input signal
  - c) Unit impulse input signal
  - d) Exponentially decaying signal
- 10) Spring constant in force-voltage analogy is analogous to \_\_\_\_\_.  
a) capacitance                      b) reciprocal of capacitance  
c) current                          d) resistance
- 11) Static error co-efficients are used as a measure of the effectiveness of closed loop systems for specified \_\_\_\_\_ input signal.  
a) acceleration                      b) velocity  
c) position                          d) all of the above
- 12) The type 2 system has \_\_\_\_\_ at the origin.  
a) no net pole                      b) net pole  
c) simple pole                      d) two poles
- 13) The position and velocity errors of a type-2 system are \_\_\_\_\_.  
a) constant, constant              b) constant, infinity  
c) zero, constant                  d) zero, zero
- 14) Velocity error constant of a system is measured when the input to the system is unit \_\_\_\_\_ function.  
a) parabolic                      b) ramp  
c) impulse                          d) step

Seat No.	
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

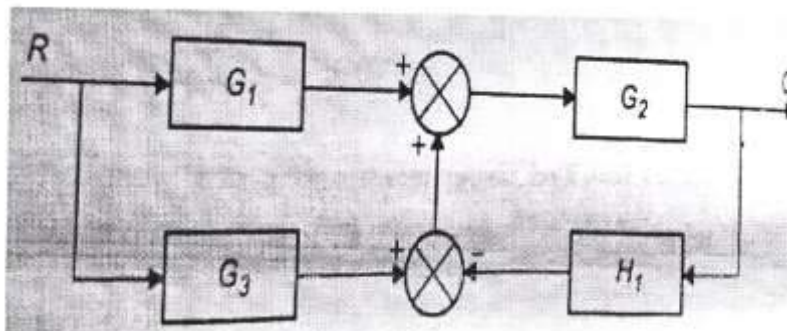
Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
 2) Figure to the right indicates full marks.

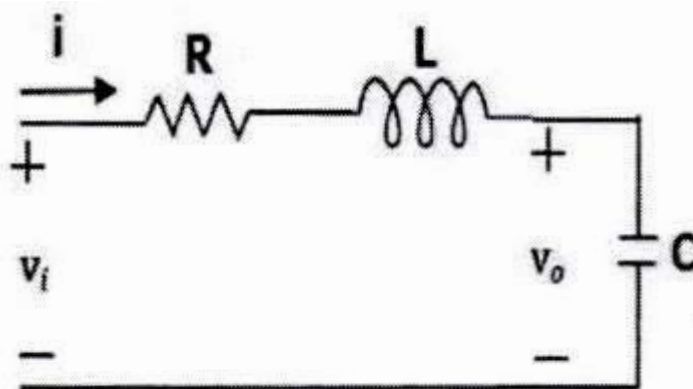
**Section – I**

**Q.2 Solve any four.****16**

a) Using block diagram reduction technique, find the Transfer function.



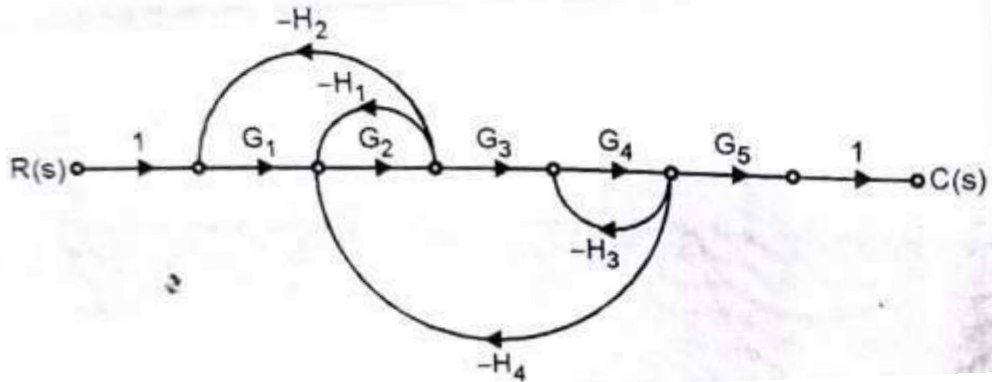
- b) Explain the sensitivity of the control system. Derive it for open loop control system.  
 c) Derive the expression for transfer function of simple feedback system.  
 d) Explain terminologies used in signal flow graph.  
 e) Define transfer function. Find the transfer function of below system.



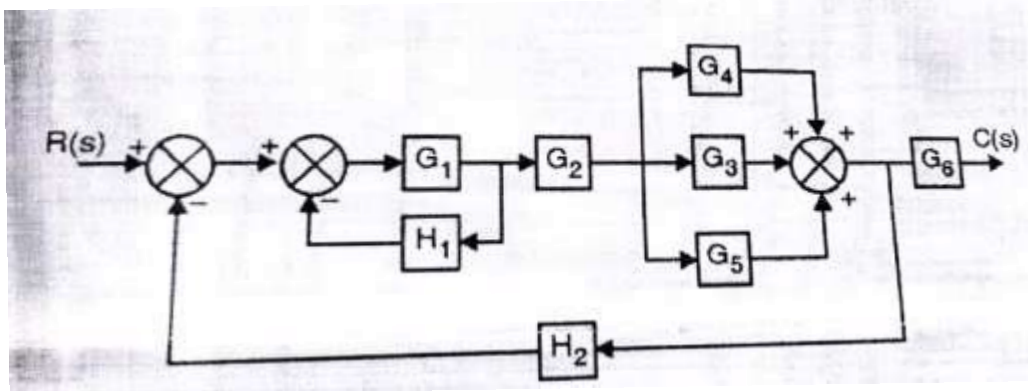


**Q.3 Solve any two.**

- a) By using Mason's Gain formula find the transfer function of the system below



- b) Explain Force Voltage (F-V) Analogy with neat diagram.  
 c) Derive the transfer function of the system shown below.

**Section – II****Q.4 Solve Any Four.**

16

- a) Explain the Angle criteria and magnitude criteria for root locus.  
 b) Define The following terms.  
 1) Phase margin  
 2) Phase cross over frequency  
 3) Gain margin  
 4) gain cross over frequency  
 c) A second order system is given by  $\frac{C(s)}{R(s)} = \frac{25}{s^2 + 5s + 25}$   
 Find damping factor, damped frequency of oscillations.  
 d) Determine the stability of the system having characteristic equation as  
 $s^3 + 6s^2 + 12s + 8 = 0$   
 e) What are the different types of controllers?

**Q.5 Solve Any Two.**

12

- a) Draw the root locus for the unity feedback system with  
 $G(s) = \frac{k}{s(s+1)(s+3)}$   
 comment on stability.

- b)** A unity feedback system has  $G(s) = \frac{2(s+3)}{(s+1)(s+6)}$

Determine:

- 1) Type of system
- 2) All error constants
- 3) Steady state Error Error when subjected to a step of magnitude '2'

- c)** Contract The Bode Plot For The System Below.

Determine:

- 1) Gain crossover frequency
- 2) The phase crossover frequency
- 3) Gain margin
- 4) Phase margin

$$G(S)H(S) = \frac{10}{s(1 + s)(10 + s)}$$

**Seat  
No.**

Set	S
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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

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Marks: 14

14

- Page 16 of 20

- 10)** The transient response of a system is mainly due to \_\_\_\_\_.  
a) inertia forces                      b) internal forces  
c) stored energy                        d) friction
- 11)** \_\_\_\_\_ signal will become zero when the feedback signal and reference signals are equal.  
a) Input                                  b) Actuating  
c) Feedback                             d) Reference
- 12)** The transfer function is applicable to which of the following?  
a) Linear and time-invariant systems  
b) Linear and time-variant systems  
c) Linear systems  
d) Non-linear systems  
e) None of the above
- 13)** With feedback \_\_\_\_\_ increases.  
a) system stability                      b) sensitivity  
c) gain                                      d) effects of disturbing signals
- 14)** By which of the following the system response can be tested better?  
a) Ramp input signal                      b) Sinusoidal input signal  
c) Unit impulse input signal              d) Exponentially decaying signal

Seat No.	
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**T.Y (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

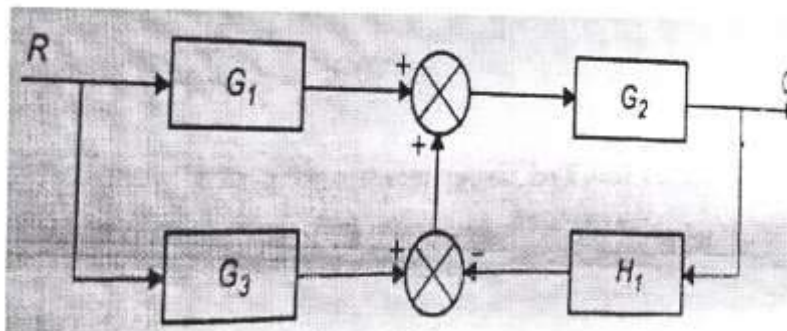
Max. Marks: 56

**Instructions:** 1) Both sections are compulsory.  
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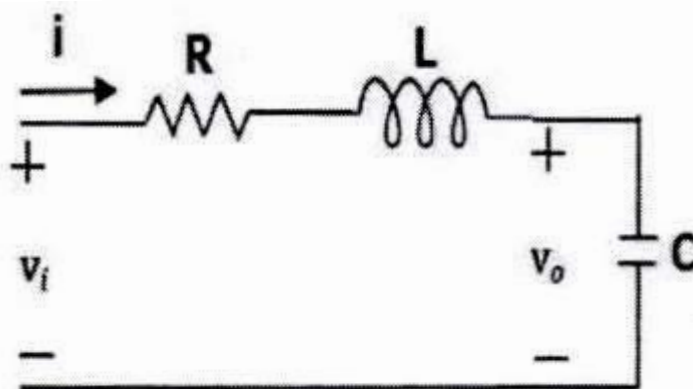
**Section – I**

**Q.2 Solve any four.****16**

a) Using block diagram reduction technique, find the Transfer function.

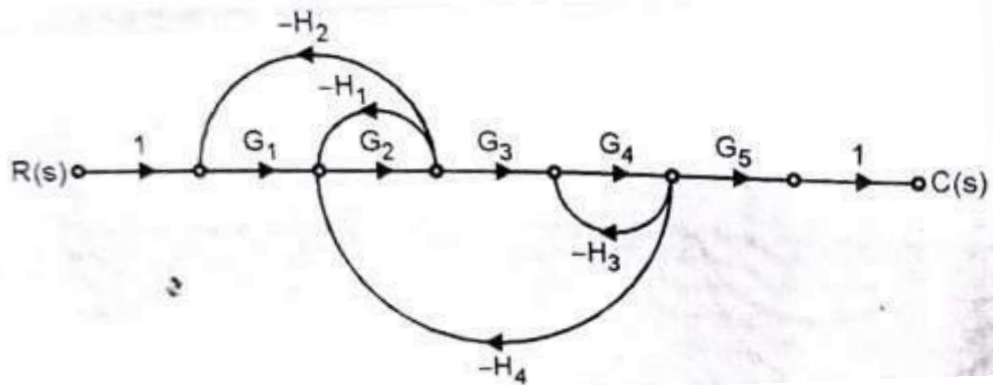


- b) Explain the sensitivity of the control system. Derive it for open loop control system.  
 c) Derive the expression for transfer function of simple feedback system.  
 d) Explain terminologies used in signal flow graph.  
 e) Define transfer function. Find the transfer function of below system.

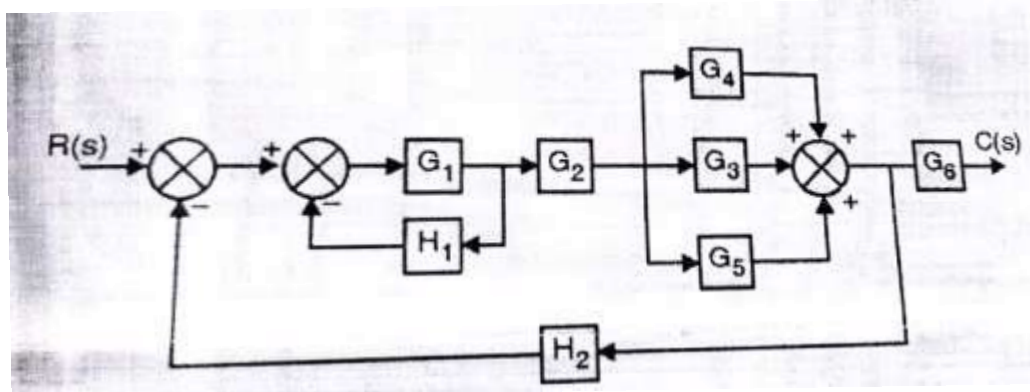


**Q.3 Solve any two.**

- a) By using Mason's Gain formula find the transfer function of the system below



- b) Explain Force Voltage (F-V) Analogy with neat diagram.  
c) Derive the transfer function of the system shown below.

**Section – II****Q.4 Solve Any Four.**

16

- a) Explain the Angle criteria and magnitude criteria for root locus.  
b) Define The following terms.  
1) Phase margin  
2) Phase cross over frequency  
3) Gain margin  
4) gain cross over frequency  
c) A second order system is given by  $\frac{C(s)}{R(s)} = \frac{25}{s^2 + 5s + 25}$   
Find damping factor, damped frequency of oscillations.  
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**Q.5 Solve Any Two.**

12

- a) Draw the root locus for the unity feedback system with  
$$G(s) = \frac{k}{s(s+1)(s+3)}$$
  
comment on stability.

- b)** A unity feedback system has  $G(s) = \frac{2(s+3)}{(s+1)(s+6)}$

Determine:

- 1) Type of system
- 2) All error constants
- 3) Steady state Error Error when subjected to a step of magnitude '2'

- c)** Construct The Bode Plot For The System Below.

Determine:

- 1) Gain crossover frequency
- 2) The phase crossover frequency
- 3) Gain margin
- 4) Phase margin

$$G(S)H(S) = \frac{10}{s(1 + s)(10 + s)}$$

<b>Seat No.</b>	
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- 9) The act of acquiring an instruction is referred as the \_\_\_\_\_ instruction.
- |              |             |
|--------------|-------------|
| a) Fetching  | b) Decoding |
| c) Execution | d) None     |
- 10) What is the standard form of ARM?
- |                          |                           |
|--------------------------|---------------------------|
| a) Advanced RISC machine | b) Automatic RISC machine |
| c) Automatic RISC motor  | d) None of these          |
- 11) While interfacing 8051 microcontroller with 16 x 2 LCD, what is the status of enable line for write operation?
- |                |                |
|----------------|----------------|
| a) High        | b) Low         |
| c) High to Low | d) Low to High |
- 12) PIC 16F8XX is a \_\_\_\_\_ bit microcontroller
- |       |                  |
|-------|------------------|
| a) 8  | b) 16            |
| c) 32 | d) None of these |
- 13) In compare mode \_\_\_\_\_ is used.
- |            |            |
|------------|------------|
| a) Timer 0 | b) Timer 1 |
| c) Timer 2 | d) Timer 3 |
- 14) To rotate stepper motor in anticlockwise rotation, which following instruction line will be correct?
- MOV A, #66h,  
BACK: MOV P1, A  
.....  
ACALL DELAY  
SJMP BACK
- |          |          |
|----------|----------|
| a) RRC A | b) RLC A |
| c) RR A  | d) RL A  |

Seat No.	
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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced Microcontroller System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any Four questions:** **16**

- a) Draw and explain the block diagram of digital computer.
- b) Compare Microprocessor and Microcontroller.
- c) Explain different addressing modes of instructions of 8051 microcontroller.
- d) Write an ALP to transfer 10 bytes of data from RAM location 40H to location 50H in 8051 microcontroller.
- e) Mention and explain serial port special function registers of 8051 microcontroller.

**Q.3 Attempt any two questions:** **12**

- a) Draw and explain architecture of 8051 microcontroller in detail.
- b) Explain the following instruction mnemonics of 8051 with examples: MOVX, ANL, RRC, ADC, DJNZ, ACALL
- c) Explain different types of memories of micro-computer systems.

**Section - II**

**Q.4 Attempt any four questions.** **16**

- a) Draw the interfacing diagram of Program ROM of 8KB and Data ROM of 8KB to 8051 microcontroller and also mention the address range of interfaced memory.
- b) Mention the features of PIC 16F877A microcontroller.
- c) Explain the following:
  - 1) Register file of ARM processor
  - 2) cpsr register of ARM processor
- d) Write an assembly language program to generate square wave using DAC 0808 and also draw the interfacing diagram.
- e) Explain memory organization of PIC 16F877A microcontroller.

**Q.5 Attempt any two questions.** **12**

- a) Draw the interfacing diagram of 16 x 2 LCD display with 8051 microcontroller and write ALP to display "SAVE EARTH" on lcd display.
- b) Draw the interfacing of DC motor with 8051 microcontroller. Write, an ALP; SW switch is connected at P2.7 and if SW=0, rotate DC motor in clockwise and if SW=1, rotate DC motor in counter clockwise.
- c) Explain pipelining concept in ARM processor.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 4 of 12

- 8) How many bytes of bit addressable memory is present in 8051 based microcontroller?
  - a) 8 bytes
  - b) 32 bytes
  - c) 16 bytes
  - d) 128 bytes
- 9) If TMOD=10H, choose the correct alternative \_\_\_\_\_.
  - a) Timer0 in mode1
  - b) Timer1 in mode0
  - c) Timer1 in mode1
  - d) Timer0 in mode 2
- 10) Which architecture provides separate buses for program and data memory?
  - a) Harvard Architecture
  - b) Von Neumann Architecture
  - c) RISC architecture
  - d) None of these
- 11) Microprocessor 8085 has internal memory; State whether True or False.
  - a) True
  - b) False
- 12) DPTR stores \_\_\_\_\_ bit memory address in it.
  - a) 8
  - b) 12
  - c) 16
  - d) 32
- 13) On reset ports of 8051 microcontroller are initialized to \_\_\_\_\_ data.
  - a) 07h
  - b) 09h
  - c) 00h
  - d) FFh
- 14) MUL AB instruction, in A register \_\_\_\_\_ byte of result is stored and in B register \_\_\_\_\_ byte of result is stored.
  - a) higher, lower
  - b) lower, higher
  - c) lower, lower
  - d) None

<b>Seat No.</b>	
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**Set Q**

**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced Microcontroller System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.  
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**Section – I**

**Q.2 Attempt any Four questions:** **16**

- a) Draw and explain the block diagram of digital computer.
- b) Compare Microprocessor and Microcontroller.
- c) Explain different addressing modes of instructions of 8051 microcontroller.
- d) Write an ALP to transfer 10 bytes of data from RAM location 40H to location 50H in 8051 microcontroller.
- e) Mention and explain serial port special function registers of 8051 microcontroller.

**Q.3 Attempt any two questions:** **12**

- a) Draw and explain architecture of 8051 microcontroller in detail.
- b) Explain the following instruction mnemonics of 8051 with examples: MOVX, ANL, RRC, ADC, DJNZ, ACALL
- c) Explain different types of memories of micro-computer systems.

**Section - II**

**Q.4 Attempt any four questions.** **16**

- a) Draw the interfacing diagram of Program ROM of 8KB and Data ROM of 8KB to 8051 microcontroller and also mention the address range of interfaced memory.
- b) Mention the features of PIC 16F877A microcontroller.
- c) Explain the following:
  - 1) Register file of ARM processor
  - 2) cpsr register of ARM processor
- d) Write an assembly language program to generate square wave using DAC 0808 and also draw the interfacing diagram.
- e) Explain memory organization of PIC 16F877A microcontroller.

**Q.5 Attempt any two questions.** **12**

- a) Draw the interfacing diagram of 16 x 2 LCD display with 8051 microcontroller and write ALP to display "SAVE EARTH" on lcd display.
- b) Draw the interfacing of DC motor with 8051 microcontroller. Write, an ALP; SW switch is connected at P2.7 and if SW=0, rotate DC motor in clockwise and if SW=1, rotate DC motor in counter clockwise.
- c) Explain pipelining concept in ARM processor.

Seat No.	
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Set	R
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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced Microcontroller System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) While interfacing 8051 microcontroller with 16 x 2 LCD, what is the status of enable line for write operation?
  - a) High
  - b) Low
  - c) High to Low
  - d) Low to High
- 2) PIC 16F8XX is a \_\_\_\_\_ bit microcontroller
  - a) 8
  - b) 16
  - c) 32
  - d) None of these
- 3) In compare mode \_\_\_\_\_ is used.
  - a) Timer 0
  - b) Timer 1
  - c) Timer 2
  - d) Timer 3
- 4) To rotate stepper motor in anticlockwise rotation, which following instruction line will be correct?  
 MOV A, #66h,  
 BACK: MOV P1, A  
 .....  
 ACALL DELAY  
 SJMP BACK
  - a) RRC A
  - b) RLC A
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  - d) RL A
- 5) How many bytes of bit addressable memory is present in 8051 based microcontroller?
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- 7) Which architecture provides separate buses for program and data memory?
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- 8)** Microprocessor 8085 has internal memory; State whether True or False.  
a) True                                      b) False
- 9)** DPTR stores \_\_\_\_\_ bit memory address in it.  
a) 8    b) 12  
c) 16                                        d) 32
- 10)** On reset ports of 8051 microcontroller are initialized to \_\_\_\_\_ data.  
a) 07h                                      b) 09h  
c) 00h                                      d) FFh
- 11)** MUL AB instruction, in A register \_\_\_\_\_ byte of result is stored and in B register \_\_\_\_\_ byte of result is stored.  
a) higher, lower                              b) lower, higher  
c) lower, lower                                d) None
- 12)** 8KB EEPROM has how many address lines and data lines?  
a) 10, 8                                      b) 11, 8  
c) 12, 8                                      d) 13, 8
- 13)** The act of acquiring an instruction is referred as the \_\_\_\_\_ instruction.  
a) Fetching                                      b) Decoding  
c) Execution                                    d) None
- 14)** What is the standard form of ARM?  
a) Advanced RISC machine                              b) Automatic RISC machine  
c) Automatic RISC motor                                d) None of these

Seat No.	
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Set 

R
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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced Microcontroller System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
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**Section – I**

**Q.2 Attempt any Four questions:** **16**

- a) Draw and explain the block diagram of digital computer.
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**Section - II**

**Q.4 Attempt any four questions.** **16**

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Seat No.	
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**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced Microcontroller System**

Day & Date: Friday, 24-02-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) On reset ports of 8051 microcontroller are initialized to \_\_\_\_\_ data.
 

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c) 00h	d) FFh
- 2) MUL AB instruction, in A register \_\_\_\_\_ byte of result is stored and in B register \_\_\_\_\_ byte of result is stored.
 

a) higher, lower	b) lower, higher
c) lower, lower	d) None
- 3) 8KB EEPROM has how many address lines and data lines?
 

a) 10, 8	b) 11, 8
c) 12, 8	d) 13, 8
- 4) The act of acquiring an instruction is referred as the \_\_\_\_\_ instruction.
 

a) Fetching	b) Decoding
c) Execution	d) None
- 5) What is the standard form of ARM?
 

a) Advanced RISC machine	b) Automatic RISC machine
c) Automatic RISC motor	d) None of these
- 6) While interfacing 8051 microcontroller with 16 x 2 LCD, what is the status of enable line for write operation?
 

a) High	b) Low
c) High to Low	d) Low to High
- 7) PIC 16F8XX is a \_\_\_\_\_ bit microcontroller
 

a) 8	b) 16
c) 32	d) None of these
- 8) In compare mode \_\_\_\_\_ is used.
 

a) Timer 0	b) Timer 1
c) Timer 2	d) Timer 3

- 9)** To rotate stepper motor in anticlockwise rotation, which following instruction line will be correct?
- ```
MOV A, #66h,  
BACK: MOV P1, A  
  
.....  
ACALL DELAY  
SJMP BACK
```
- a) RRC A                                  b) RLC A  
c) RR A                                    d) RL A
- 10)** How many bytes of bit addressable memory is present in 8051 based microcontroller?
- a) 8 bytes                                 b) 32 bytes  
c) 16 bytes                                d) 128 bytes
- 11)** If TMOD=10H, choose the correct alternative \_\_\_\_\_.
- a) Timer0 in mode1                      b) Timer1 in mode0  
c) Timer1 in mode1                      d) Timer0 in mode 2
- 12)** Which architecture provides separate buses for program and data memory?
- a) Harvard Architecture                  b) Von Neumann Architecture  
c) RISC architecture                      d) None of these
- 13)** Microprocessor 8085 has internal memory; State whether True or False.
- a) True                                      b) False
- 14)** DPTR stores \_\_\_\_\_ bit memory address in it.
- a) 8                                          b) 12  
c) 16                                        d) 32

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**Set S**

**T.Y (B.Tech.) (Semester -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced Microcontroller System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Both Section are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Attempt any Four questions:** **16**

- a) Draw and explain the block diagram of digital computer.
- b) Compare Microprocessor and Microcontroller.
- c) Explain different addressing modes of instructions of 8051 microcontroller.
- d) Write an ALP to transfer 10 bytes of data from RAM location 40H to location 50H in 8051 microcontroller.
- e) Mention and explain serial port special function registers of 8051 microcontroller.

**Q.3 Attempt any two questions:** **12**

- a) Draw and explain architecture of 8051 microcontroller in detail.
- b) Explain the following instruction mnemonics of 8051 with examples: MOVX, ANL, RRC, ADC, DJNZ, ACALL
- c) Explain different types of memories of micro-computer systems.

**Section - II**

**Q.4 Attempt any four questions.** **16**

- a) Draw the interfacing diagram of Program ROM of 8KB and Data ROM of 8KB to 8051 microcontroller and also mention the address range of interfaced memory.
- b) Mention the features of PIC 16F877A microcontroller.
- c) Explain the following:
  - 1) Register file of ARM processor
  - 2) cpsr register of ARM processor
- d) Write an assembly language program to generate square wave using DAC 0808 and also draw the interfacing diagram.
- e) Explain memory organization of PIC 16F877A microcontroller.

**Q.5 Attempt any two questions.** **12**

- a) Draw the interfacing diagram of 16 x 2 LCD display with 8051 microcontroller and write ALP to display "SAVE EARTH" on lcd display.
- b) Draw the interfacing of DC motor with 8051 microcontroller. Write, an ALP; SW switch is connected at P2.7 and if SW=0, rotate DC motor in clockwise and if SW=1, rotate DC motor in counter clockwise.
- c) Explain pipelining concept in ARM processor.

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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 1:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.

## Marks:14

14

- Page 1 of 17

- 9) Biot Savart law in magnetic field is analogous to \_\_\_\_\_ in electric field.
- a) Gauss law
  - b) Faraday law
  - c) Coulomb law
  - d) Ampere law
- 10) Maxwell equation that is valid in any conductor is \_\_\_\_\_.
- a)  $\text{Curl}(\mathbf{H}) = \mathbf{Jc}$
  - b)  $\text{Curl}(\mathbf{E}) = \mathbf{Jc}$
  - c)  $\text{Curl}(\mathbf{E}) = \mathbf{Jd}$
  - d)  $\text{Curl}(\mathbf{H}) = \mathbf{Jd}$
- 11) In the conversion of line integral of  $\mathbf{H}$  into surface integral, \_\_\_\_\_ theorem is used.
- a) Divergence Theorem
  - b) Gauss Theorem
  - c) Stokes Theorem
  - d) It cannot be converted
- 12) The curl of  $\mathbf{E}$  when  $\mathbf{B}$  is given as  $15t$  is \_\_\_\_\_.
- a) 15
  - b) -15
  - c) 7.5
  - d) - 7.5
- 13) Energy density of magnetic field is \_\_\_\_\_.
- a)  $\frac{1}{2} \mu H^2$
  - b)  $\mu H^2$
  - c)  $\mu H$
  - d)  $\frac{1}{2} \mu^2 H$
- 14)  $\text{Curl}(\mathbf{H}) = \mathbf{J}$  is known as \_\_\_\_\_
- a) Faraday's law
  - b) Ampere's law
  - c) Ohm's law
  - d) Gauss law

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Set

P

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.

**Section – I**

**Q.2 Solve Any Three**

12

- State and prove Gauss law.
- For given vector  $\vec{A} = 5\hat{a}_x + 4\hat{a}_y + 3\hat{a}_z$  and  $\vec{B} = 2\hat{a}_x + 3\hat{a}_y + 4\hat{a}_z$   
 Find:
  - Dot product
  - Angle between two vectors
- A scalar potential is given by  $V = 7x + 8y^2 + 4z^3$ . Find electric field intensity at (1, 3, 5).
- Derive the expression for Poisson's equation. Write Laplace's equation from Poisson's.

**Q.3 Solve Any Two**

16

- Transform vector  $\vec{A} = 8\hat{a}_x + 12\hat{a}_y + 3\hat{a}_z$  to cylindrical coordinate at point P (5, -3, 4).
- Calculate electric field intensity at (1, 4, 3) due to
  - A point charge  $Q=3mc$  located at (2, -1, 4)
  - A line density  $\rho_l = 10nc/m$  at  $X = 1$  and  $z = 4$ .
  - A plane  $y=3$  carrying a surface charge density  $\rho_s = 10 nc/m^2$ .
- Define capacitance of capacitor. Prove that capacitance of parallel plate capacitor is given as  $C = \frac{\epsilon A}{d}$  where  $\epsilon$  is permittivity, A is plate area and d is distance between plates.

**Section – II**

**Q.4 Solve Any Three**

12

- State and explain Biot -Savarts's law
- A radial field  $\vec{H} = \frac{2.39 \times 10^6}{\rho} \cos \varphi \hat{a}_\rho$  exist in free space. Find the flux crossing surface area defined by  $0 \leq \varphi \leq \frac{\pi}{4}$  and  $0 \leq z \leq 1$ .
- A lossy dielectric has  $\mu_r = 1, \epsilon_r = 1, \sigma = 2 \times 10^{-8}$  and  $\vec{E} = 100 \sin \omega t \hat{a}_z$  then find
  - Conduction current density
  - Displacement current density
- Derive expression for energy stored in inductor

**Q.5 Solve Any Two**

- a) Derive Maxwell's four equations in point form and Integral form. Also write word statement of each.
- b) Verify stroke's theorem for given field  
 $\vec{H} = 6xy \hat{a}_x - 3y^2 \hat{a}_y$  A/m in a rectangular path around a region  $2 \leq x \leq 5$  and  $-1 \leq y \leq 1, z = 0$  plane.
- c) Define Inductance of Inductor. Derive expression for inductance of solenoid.

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| <b>Seat No.</b> |  |
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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 1:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.

## Marks:14

14

- Page 5 of 17



- 10) Electric field intensity due to infinite sheet charge is \_\_\_\_\_.  
a) Zero  
b) Unity  
c)  $\frac{\rho_s}{\epsilon}$   
d)  $\frac{\rho_s}{2\epsilon}$
- 11) The electric flux density for free space is equal to \_\_\_\_\_.  
a)  $\epsilon E$   
b)  $\epsilon_0 E$   
c)  $\frac{E}{\epsilon}$   
d)  $\frac{E}{\epsilon_0}$
- 12) Surface area is enclosed by charge  $2nc$  and  $4nc$  then flux crossing the area is \_\_\_\_\_.  
a)  $2nc$   
b)  $4nc$   
c)  $6nc$   
d)  $8nc$
- 13) A capacitor stores 0.24 coulombs at 10 volts. Its capacitance is \_\_\_\_\_.  
a) 0.024 F  
b) 0.12 F  
c) 0.6 F  
d) 0.8 F
- 14) Boundary condition for electric field for tangential component is \_\_\_\_\_.  
a)  $E_{t1} = E_{t2}$   
b)  $D_{t1} = D_{t2}$   
c)  $E_{n1} = E_{n2}$   
d)  $D_{n1} = D_{n2}$

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.

**Section – I****Q.2 Solve Any Three** **12**

- a) State and prove Gauss law.
- b) For given vector  $\vec{A} = 5\hat{a}_x + 4\hat{a}_y + 3\hat{a}_z$  and  $\vec{B} = 2\hat{a}_x + 3\hat{a}_y + 4\hat{a}_z$   
 Find:
  - a) Dot product
  - b) Angle between two vectors
- c) A scalar potential is given by  $V = 7x + 8y^2 + 4z^3$ . Find electric field intensity at (1, 3, 5).
- d) Derive the expression for Poisson's equation. Write Laplace's equation from Poisson's.

**Q.3 Solve Any Two** **16**

- a) Transform vector  $\vec{A} = 8\hat{a}_x + 12\hat{a}_y + 3\hat{a}_z$  to cylindrical coordinate at point P (5, -3, 4).
- b) Calculate electric field intensity at (1, 4, 3) due to
  - a) A point charge  $Q=3mc$  located at (2, -1, 4)
  - b) A line density  $\rho_l = 10nc/m$  at  $X = 1$  and  $z = 4$ .
  - c) A plane  $y=3$  carrying a surface charge density  $\rho_s = 10 nc/m^2$ .
- c) Define capacitance of capacitor. Prove that capacitance of parallel plate capacitor is given as  $C = \frac{\epsilon A}{d}$  where  $\epsilon$  is permittivity, A is plate area and d is distance between plates.

**Section – II****Q.4 Solve Any Three** **12**

- a) State and explain Biot -Savarts's law
- b) A radial field  $\vec{H} = \frac{2.39 \times 10^6}{\rho} \cos \varphi \hat{a}_\rho$  exist in free space. Find the flux crossing surface area defined by  $0 \leq \varphi \leq \frac{\pi}{4}$  and  $0 \leq z \leq 1$ .
- c) A lossy dielectric has  $\mu_r = 1, \epsilon_r = 1, \sigma = 2 \times 10^{-8}$  and  $\vec{E} = 100 \sin \omega t \hat{a}_z$  then find
  - i) Conduction current density
  - ii) Displacement current density
- d) Derive expression for energy stored in inductor

**Q.5 Solve Any Two**

- a) Derive Maxwell's four equations in point form and Integral form. Also write word statement of each.
- b) Verify stroke's theorem for given field  
 $\vec{H} = 6xy \hat{a}_x - 3y^2 \hat{a}_y$  A/m in a rectangular path around a region  $2 \leq x \leq 5$  and  $-1 \leq y \leq 1, z = 0$  plane.
- c) Define Inductance of Inductor. Derive expression for inductance of solenoid.

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| Set | R |
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) In the conversion of line integral of H into surface integral, \_\_\_\_\_ theorem is used.
 

|                       |                           |
|-----------------------|---------------------------|
| a) Divergence Theorem | b) Gauss Theorem          |
| c) Stokes Theorem     | d) It cannot be converted |
- 2) The curl of E when B is given as  $15t$  is \_\_\_\_\_.
 

|        |          |
|--------|----------|
| a) 15  | b) -15   |
| c) 7.5 | d) - 7.5 |
- 3) Energy density of magnetic field is \_\_\_\_\_.
 

|                          |                          |
|--------------------------|--------------------------|
| a) $\frac{1}{2} \mu H^2$ | b) $\mu H^2$             |
| c) $\mu H$               | d) $\frac{1}{2} \mu^2 H$ |
- 4)  $\text{Curl}(H) = J$  is known as \_\_\_\_\_.
 

|                  |                 |
|------------------|-----------------|
| a) Faraday's law | b) Ampere's law |
| c) Ohm's law     | d) Gauss law    |
- 5) Gradient is applied on \_\_\_\_\_ and resultant is \_\_\_\_\_.
 

|                   |                   |
|-------------------|-------------------|
| a) Scalar, Scalar | b) Scalar, Vector |
| c) Vector, Scalar | d) Vector, Vector |
- 6) The vectors  $\vec{A}$  and  $\vec{B}$  are perpendicular to each other when \_\_\_\_\_.
 

|                                 |                                    |
|---------------------------------|------------------------------------|
| a) $\vec{A} \cdot \vec{B} = 0$  | b) $\vec{A} \cdot \vec{B} \neq 0$  |
| c) $\vec{A} \times \vec{B} = 0$ | d) $\vec{A} \times \vec{B} \neq 0$ |
- 7) Electric field intensity due to infinite sheet charge is \_\_\_\_\_.
 

|                              |                               |
|------------------------------|-------------------------------|
| a) Zero                      | b) Unity                      |
| c) $\frac{\rho_s}{\epsilon}$ | d) $\frac{\rho_s}{2\epsilon}$ |
- 8) The electric flux density for free space is equal to \_\_\_\_\_.
 

|                         |                           |
|-------------------------|---------------------------|
| a) $\epsilon E$         | b) $\epsilon_0 E$         |
| c) $\frac{E}{\epsilon}$ | d) $\frac{E}{\epsilon_0}$ |

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| Seat No. |  |
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Set **R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.

**Section – I****Q.2 Solve Any Three****12**

- State and prove Gauss law.
- For given vector  $\vec{A} = 5\hat{a}_x + 4\hat{a}_y + 3\hat{a}_z$  and  $\vec{B} = 2\hat{a}_x + 3\hat{a}_y + 4\hat{a}_z$   
 Find:
  - Dot product
  - Angle between two vectors
- A scalar potential is given by  $V = 7x + 8y^2 + 4z^3$ . Find electric field intensity at (1, 3, 5).
- Derive the expression for Poisson's equation. Write Laplace's equation from Poisson's.

**Q.3 Solve Any Two****16**

- Transform vector  $\vec{A} = 8\hat{a}_x + 12\hat{a}_y + 3\hat{a}_z$  to cylindrical coordinate at point P (5, -3, 4).
- Calculate electric field intensity at (1, 4, 3) due to
  - A point charge  $Q=3mc$  located at (2, -1, 4)
  - A line density  $\rho_l = 10nc/m$  at  $X = 1$  and  $z = 4$ .
  - A plane  $y=3$  carrying a surface charge density  $\rho_s = 10 nc/m^2$ .
- Define capacitance of capacitor. Prove that capacitance of parallel plate capacitor is given as  $C = \frac{\epsilon A}{d}$  where  $\epsilon$  is permittivity, A is plate area and d is distance between plates.

**Section – II****Q.4 Solve Any Three****12**

- State and explain Biot -Savarts's law
- A radial field  $\vec{H} = \frac{2.39 \times 10^6}{\rho} \cos \varphi \hat{a}_\rho$  exist in free space. Find the flux crossing surface area defined by  $0 \leq \varphi \leq \frac{\pi}{4}$  and  $0 \leq z \leq 1$ .
- A lossy dielectric has  $\mu_r = 1, \epsilon_r = 1, \sigma = 2 \times 10^{-8}$  and  $\vec{E} = 100 \sin \omega t \hat{a}_z$  then find
  - Conduction current density
  - Displacement current density
- Derive expression for energy stored in inductor

**Q.5 Solve Any Two**

- a) Derive Maxwell's four equations in point form and Integral form. Also write word statement of each.
- b) Verify stroke's theorem for given field  
 $\vec{H} = 6xy \hat{a}_x - 3y^2 \hat{a}_y$  A/m in a rectangular path around a region  $2 \leq x \leq 5$  and  $-1 \leq y \leq 1, z = 0$  plane.
- c) Define Inductance of Inductor. Derive expression for inductance of solenoid.

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| <b>Seat No.</b> |  |
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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

14

- 1) A capacitor stores 0.24 coulombs at 10 volts. Its capacitance is \_\_\_\_\_.  
a) 0.024 F                      b) 0.12 F  
c) 0.6 F                         d) 0.8 F
- 2) Boundary condition for electric field for tangential component is \_\_\_\_\_.  
a)  $E_{t1} = E_{t2}$                   b)  $D_{t1} = D_{t2}$   
c)  $E_{n1} = E_{n2}$                   d)  $D_{n1} = D_{n2}$
- 3) The divergence of magnetic field intensity is \_\_\_\_\_.  
a) 1                                b) -1  
c) Infinity                        d) Zero
- 4) Biot Savart law in magnetic field is analogous to \_\_\_\_\_ in electric field.  
a) Gauss law                      b) Faraday law  
c) Coulomb law                   d) Ampere law
- 5) Maxwell equation that is valid in any conductor is \_\_\_\_\_.  
a)  $\text{Curl}(H) = J_c$                   b)  $\text{Curl}(E) = J_c$   
c)  $\text{Curl}(E) = J_d$                   d)  $\text{Curl}(H) = J_d$
- 6) In the conversion of line integral of H into surface integral, \_\_\_\_\_ theorem is used.  
a) Divergence Theorem              b) Gauss Theorem  
c) Stokes Theorem                    d) It cannot be converted
- 7) The curl of E when B is given as  $15t$  is \_\_\_\_\_.  
a) 15                                b) -15  
c) 7.5                                d) -7.5
- 8) Energy density of magnetic field is \_\_\_\_\_.  
a)  $\frac{1}{2} \mu H^2$                       b)  $\mu H^2$   
c)  $\mu H$                               d)  $\frac{1}{2} \mu^2 H$
- 9)  $\text{Curl}(H) = J$  is known as \_\_\_\_\_.  
a) Faraday's law                      b) Ampere's law  
c) Ohm's law                         d) Gauss law



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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
 2) All questions are compulsory.

**Section – I**

**Q.2 Solve Any Three** **12**

- State and prove Gauss law.
- For given vector  $\vec{A} = 5\hat{a}_x + 4\hat{a}_y + 3\hat{a}_z$  and  $\vec{B} = 2\hat{a}_x + 3\hat{a}_y + 4\hat{a}_z$   
 Find:
  - Dot product
  - Angle between two vectors
- A scalar potential is given by  $V = 7x + 8y^2 + 4z^3$ . Find electric field intensity at (1, 3, 5).
- Derive the expression for Poisson's equation. Write Laplace's equation from Poisson's.

**Q.3 Solve Any Two** **16**

- Transform vector  $\vec{A} = 8\hat{a}_x + 12\hat{a}_y + 3\hat{a}_z$  to cylindrical coordinate at point P (5, -3, 4).
- Calculate electric field intensity at (1, 4, 3) due to
  - A point charge  $Q=3mc$  located at (2, -1, 4)
  - A line density  $\rho_l = 10nc/m$  at  $X = 1$  and  $z = 4$ .
  - A plane  $y=3$  carrying a surface charge density  $\rho_s = 10 nc/m^2$ .
- Define capacitance of capacitor. Prove that capacitance of parallel plate capacitor is given as  $C = \frac{\epsilon A}{d}$  where  $\epsilon$  is permittivity, A is plate area and d is distance between plates.

**Section – II**

**Q.4 Solve Any Three** **12**

- State and explain Biot -Savarts's law
- A radial field  $\vec{H} = \frac{2.39 \times 10^6}{\rho} \cos \varphi \hat{a}_\rho$  exist in free space. Find the flux crossing surface area defined by  $0 \leq \varphi \leq \frac{\pi}{4}$  and  $0 \leq z \leq 1$ .
- A lossy dielectric has  $\mu_r = 1, \epsilon_r = 1, \sigma = 2 \times 10^{-8}$  and  $\vec{E} = 100 \sin \omega t \hat{a}_z$  then find
  - Conduction current density
  - Displacement current density
- Derive expression for energy stored in inductor

**Q.5 Solve Any Two**

- a) Derive Maxwell's four equations in point form and Integral form. Also write word statement of each.
- b) Verify stroke's theorem for given field  
 $\vec{H} = 6xy\hat{a}_x - 3y^2\hat{a}_y$  A/m in a rectangular path around a region  $2 \leq x \leq 5$  and  $-1 \leq y \leq 1, z = 0$  plane.
- c) Define Inductance of Inductor. Derive expression for inductance of solenoid.



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| Set | P |
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Information Technology & Management**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is at the heart of any ERP system?
 

|                |              |
|----------------|--------------|
| a) Information | b) Employees |
| c) Customers   | d) Database  |
- 2) Which command is used to remove a relation from an SQL?
 

|               |           |
|---------------|-----------|
| a) Drop table | b) Delete |
| c) Purge      | d) Remove |
- 3) Which of the following is a reason for ERPs explosive growth?
 

|                                                                        |
|------------------------------------------------------------------------|
| a) ERP is a logical solution to the mess of incompatible applications  |
| b) ERP addresses the need for global information sharing and reporting |
| c) ERP is used to avoid the pain and expense of fixing legacy systems  |
| d) All of the above                                                    |
- 4) Which forms have a relation that contains information about a single entity?
 

|        |        |
|--------|--------|
| a) 4NF | b) 2NF |
| c) 5NF | d) 3NF |
- 5) \_\_\_\_\_ is a set of one or more attributes taken collectively to uniquely identify a record.
 

|                |                  |
|----------------|------------------|
| a) Primary Key | b) Foreign key   |
| c) Super key   | d) Candidate key |
- 6) What is the iron and steel constitute of e-waste?
 

|       |       |
|-------|-------|
| a) 20 | b) 30 |
| c) 40 | d) 50 |
- 7) What is the hazardous pollutant released from LED's?
 

|            |            |
|------------|------------|
| a) Arsenic | b) Barium  |
| c) Cobalt  | d) Cadmium |
- 8) \_\_\_\_\_ is one of the fastest growing components of waste stream in the world.
 

|               |                    |
|---------------|--------------------|
| a) e-learning | b) e-shopping      |
| c) e-waste    | d) use of internet |

- 9)** Following person/persons are entitled to apply for patents \_\_\_\_\_.  
a) A person claiming to be first inventor of the invention  
b) A Legal representative of the first inventor of the invention (If he deceased)  
c) Any person who is the assignee of the first inventor of the invention  
d) All of the above
- 10)** Which of the following is (are) project(s)?  
a) building a new house  
b) creating a new computer software  
c) launching a new product for a business  
d) All of the above
- 11)** Which of the following principles is applicable to trademarks?  
a) A trademark should be distinctive  
b) A trademark should be capable of distinguishing goods or services  
c) A trademark should not cause confusion with previous trademarks  
d) A trademark should not be deceptive  
e) All of the above
- 12)** What is the first step in the software development lifecycle?  
a) System Design  
b) Coding  
c) System Testing  
d) Preliminary Investigation and Analysis
- 13)** The extended Project life cycle adds two more phases to the sequence, which are \_\_\_\_\_.  
a) concept and operations  
b) operations and termination  
c) handover and operations  
d) implementation and operations
- 14)** Which of the following is true for Project Management?  
a) It is a formal discipline for managing projects  
b) There is no single life cycle that applies to all projects  
c) Every project has some elements that are unique  
d) All of the above

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**Set****P****T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022****ELECTRICAL ENGINEERING****Information Technology & Management**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I****Q.2 Solve Any Five****20**

- a) Explain various Application of E-Business?
- b) What is Information system and describe various types of information system?
- c) Draw and Explain Architecture of database management System.
- d) Compare E-Business and E-Commerce
- e) How IT provides support to business processes?
- f) What is E-Payment System?

**Q.3 Solve Any One.****08**

- a) Explain Components of Database Management System.
- b) Differentiate the concept of Data warehouse, Data marts and Data Centers.

**Section – II****Q.4 Solve Any Five****20**

- a) Write various features of organization & organizational structure.
- b) Write the importance of data visualization and explain its applications.
- c) Enlist applications of OLAP and TPS (any 4 each)
- d) Explain phases of SDLC
- e) Discuss various ethical and social issues evolved because of IT and IS.
- f) What is the concept of green IT?

**Q.5 Solve Any one.****08**

- a) Draw and Explain SDLC Life Cycle.
- b) Explain following terms:
  - 1) Copyrights
  - 2) Patents
  - 3) E-Waste
  - 4) Intellectual property rights

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Information Technology & Management**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is one of the fastest growing components of waste stream in the world.
  - a) e-learning
  - b) e-shopping
  - c) e-waste
  - d) use of internet
- 2) Following person/persons are entitled to apply for patents \_\_\_\_\_.
  - a) A person claiming to be first inventor of the invention
  - b) A Legal representative of the first inventor of the invention (If he deceased)
  - c) Any person who is the assignee of the first inventor of the invention
  - d) All of the above
- 3) Which of the following is (are) project(s)?
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- 4) Which of the following principles is applicable to trademarks?
  - a) A trademark should be distinctive
  - b) A trademark should be capable of distinguishing goods or services
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  - e) All of the above
- 5) What is the first step in the software development lifecycle?
  - a) System Design
  - b) Coding
  - c) System Testing
  - d) Preliminary Investigation and Analysis



- 6) The extended Project life cycle adds two more phases to the sequence, which are \_\_\_\_\_.  
a) concept and operations  
b) operations and termination  
c) handover and operations  
d) implementation and operations
- 7) Which of the following is true for Project Management?  
a) It is a formal discipline for managing projects  
b) There is no single life cycle that applies to all projects  
c) Every project has some elements that are unique  
d) All of the above
- 8) What is at the heart of any ERP system?  
a) Information  
b) Employees  
c) Customers  
d) Database
- 9) Which command is used to remove a relation from an SQL?  
a) Drop table  
b) Delete  
c) Purge  
d) Remove
- 10) Which of the following is a reason for ERPs explosive growth?  
a) ERP is a logical solution to the mess of incompatible applications  
b) ERP addresses the need for global information sharing and reporting  
c) ERP is used to avoid the pain and expense of fixing legacy systems  
d) All of the above
- 11) Which forms have a relation that contains information about a single entity?  
a) 4NF  
b) 2NF  
c) 5NF  
d) 3NF
- 12) \_\_\_\_\_ is a set of one or more attributes taken collectively to uniquely identify a record.  
a) Primary Key  
b) Foreign key  
c) Super key  
d) Candidate key
- 13) What is the iron and steel constitute of e-waste?  
a) 20  
b) 30  
c) 40  
d) 50
- 14) What is the hazardous pollutant released from LED's?  
a) Arsenic  
b) Barium  
c) Cobalt  
d) Cadmium

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Information Technology & Management**

Day & Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve Any Five** **20**

- a) Explain various Application of E-Business?
- b) What is Information system and describe various types of information system?
- c) Draw and Explain Architecture of database management System.
- d) Compare E-Business and E-Commerce
- e) How IT provides support to business processes?
- f) What is E-Payment System?

**Q.3 Solve Any One.** **08**

- a) Explain Components of Database Management System.
- b) Differentiate the concept of Data warehouse, Data marts and Data Centers.

**Section – II**

**Q.4 Solve Any Five** **20**

- a) Write various features of organization & organizational structure.
- b) Write the importance of data visualization and explain its applications.
- c) Enlist applications of OLAP and TPS (any 4 each)
- d) Explain phases of SDLC
- e) Discuss various ethical and social issues evolved because of IT and IS.
- f) What is the concept of green IT?

**Q.5 Solve Any one.** **08**

- a) Draw and Explain SDLC Life Cycle.
- b) Explain following terms:
  - 1) Copyrights
  - 2) Patents
  - 3) E-Waste
  - 4) Intellectual property rights

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022****ELECTRICAL ENGINEERING****Information Technology & Management**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:**
- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
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  - 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) Which of the following principles is applicable to trademarks?
  - a) A trademark should be distinctive
  - b) A trademark should be capable of distinguishing goods or services
  - c) A trademark should not cause confusion with previous trademarks
  - d) A trademark should not be deceptive
  - e) All of the above
- 2) What is the first step in the software development lifecycle?
  - a) System Design
  - b) Coding
  - c) System Testing
  - d) Preliminary Investigation and Analysis
- 3) The extended Project life cycle adds two more phases to the sequence, which are \_\_\_\_\_.
  - a) concept and operations
  - b) operations and termination
  - c) handover and operations
  - d) implementation and operations
- 4) Which of the following is true for Project Management?
  - a) It is a formal discipline for managing projects
  - b) There is no single life cycle that applies to all projects
  - c) Every project has some elements that are unique
  - d) All of the above
- 5) What is at the heart of any ERP system?
 

|                |              |
|----------------|--------------|
| a) Information | b) Employees |
| c) Customers   | d) Database  |
- 6) Which command is used to remove a relation from an SQL?
 

|               |           |
|---------------|-----------|
| a) Drop table | b) Delete |
| c) Purge      | d) Remove |

- 7) Which of the following is a reason for ERPs explosive growth?
- a) ERP is a logical solution to the mess of incompatible applications
  - b) ERP addresses the need for global information sharing and reporting
  - c) ERP is used to avoid the pain and expense of fixing legacy systems
  - d) All of the above
- 8) Which forms have a relation that contains information about a single entity?
- a) 4NF
  - b) 2NF
  - c) 5NF
  - d) 3NF
- 9) \_\_\_\_\_ is a set of one or more attributes taken collectively to uniquely identify a record.
- a) Primary Key
  - b) Foreign key
  - c) Super key
  - d) Candidate key
- 10) What is the iron and steel constitute of e-waste?
- a) 20
  - b) 30
  - c) 40
  - d) 50
- 11) What is the hazardous pollutant released from LED's?
- a) Arsenic
  - b) Barium
  - c) Cobalt
  - d) Cadmium
- 12) \_\_\_\_\_ is one of the fastest growing components of waste stream in the world.
- a) e-learning
  - b) e-shopping
  - c) e-waste
  - d) use of internet
- 13) Following person/persons are entitled to apply for patents \_\_\_\_\_.
- a) A person claiming to be first inventor of the invention
  - b) A Legal representative of the first inventor of the invention (If he deceased)
  - c) Any person who is the assignee of the first inventor of the invention
  - d) All of the above
- 14) Which of the following is (are) project(s)?
- a) building a new house
  - b) creating a new computer software
  - c) launching a new product for a business
  - d) All of the above

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Information Technology & Management**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve Any Five** **20**

- a) Explain various Application of E-Business?
- b) What is Information system and describe various types of information system?
- c) Draw and Explain Architecture of database management System.
- d) Compare E-Business and E-Commerce
- e) How IT provides support to business processes?
- f) What is E-Payment System?

**Q.3 Solve Any One.** **08**

- a) Explain Components of Database Management System.
- b) Differentiate the concept of Data warehouse, Data marts and Data Centers.

**Section – II**

**Q.4 Solve Any Five** **20**

- a) Write various features of organization & organizational structure.
- b) Write the importance of data visualization and explain its applications.
- c) Enlist applications of OLAP and TPS (any 4 each)
- d) Explain phases of SDLC
- e) Discuss various ethical and social issues evolved because of IT and IS.
- f) What is the concept of green IT?

**Q.5 Solve Any one.** **08**

- a) Draw and Explain SDLC Life Cycle.
- b) Explain following terms:
  - 1) Copyrights
  - 2) Patents
  - 3) E-Waste
  - 4) Intellectual property rights

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Information Technology & Management**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is the iron and steel constitute of e-waste?
 

|       |       |
|-------|-------|
| a) 20 | b) 30 |
| c) 40 | d) 50 |
- 2) What is the hazardous pollutant released from LED's?
 

|            |            |
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| a) Arsenic | b) Barium  |
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- 3) \_\_\_\_\_ is one of the fastest growing components of waste stream in the world.
 

|               |                    |
|---------------|--------------------|
| a) e-learning | b) e-shopping      |
| c) e-waste    | d) use of internet |
- 4) Following person/persons are entitled to apply for patents \_\_\_\_\_.
 

|                                                                                   |
|-----------------------------------------------------------------------------------|
| a) A person claiming to be first inventor of the invention                        |
| b) A Legal representative of the first inventor of the invention (If he deceased) |
| c) Any person who is the assignee of the first inventor of the invention          |
| d) All of the above                                                               |
- 5) Which of the following is (are) project(s)?
 

|                                           |
|-------------------------------------------|
| a) building a new house                   |
| b) creating a new computer software       |
| c) launching a new product for a business |
| d) All of the above                       |
- 6) Which of the following principles is applicable to trademarks?
 

|                                                                      |
|----------------------------------------------------------------------|
| a) A trademark should be distinctive                                 |
| b) A trademark should be capable of distinguishing goods or services |
| c) A trademark should not cause confusion with previous trademarks   |
| d) A trademark should not be deceptive                               |
| e) All of the above                                                  |

- 7) What is the first step in the software development lifecycle?
- a) System Design
  - b) Coding
  - c) System Testing
  - d) Preliminary Investigation and Analysis
- 8) The extended Project life cycle adds two more phases to the sequence, which are \_\_\_\_.
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  - c) handover and operations
  - d) implementation and operations
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  - d) All of the above
- 13) Which forms have a relation that contains information about a single entity?
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  - b) 2NF
  - c) 5NF
  - d) 3NF
- 14) \_\_\_\_\_ is a set of one or more attributes taken collectively to uniquely identify a record.
- a) Primary Key
  - b) Foreign key
  - c) Super key
  - d) Candidate key

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Information Technology & Management**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve Any Five** **20**

- a) Explain various Application of E-Business?
- b) What is Information system and describe various types of information system?
- c) Draw and Explain Architecture of database management System.
- d) Compare E-Business and E-Commerce
- e) How IT provides support to business processes?
- f) What is E-Payment System?

**Q.3 Solve Any One.** **08**

- a) Explain Components of Database Management System.
- b) Differentiate the concept of Data warehouse, Data marts and Data Centers.

**Section – II**

**Q.4 Solve Any Five** **20**

- a) Write various features of organization & organizational structure.
- b) Write the importance of data visualization and explain its applications.
- c) Enlist applications of OLAP and TPS (any 4 each)
- d) Explain phases of SDLC
- e) Discuss various ethical and social issues evolved because of IT and IS.
- f) What is the concept of green IT?

**Q.5 Solve Any one.** **08**

- a) Draw and Explain SDLC Life Cycle.
- b) Explain following terms:
  - 1) Copyrights
  - 2) Patents
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  - 4) Intellectual property rights



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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which is not one of the natures of ethics?
 

|                          |                             |
|--------------------------|-----------------------------|
| a) Focus on human values | b) Social work              |
| c) Branch of philosophy  | d) Applies moral principles |
- 2) Why business ethics are important?
 

|                                                        |
|--------------------------------------------------------|
| a) It formulates the firm's image and builds the brand |
| b) It influences the buying decision of the customers  |
| c) Build confidence within employees                   |
| d) All of the above                                    |
- 3) Which one of the following is not principle business ethics?
 

|                              |                                 |
|------------------------------|---------------------------------|
| a) Principle of universality | b) Principle of humanity        |
| c) Principle of autonomy     | d) Principle of dissatisfaction |
- 4) Code of conduct does not include
 

|               |              |
|---------------|--------------|
| a) Dishonesty | b) Rules     |
| c) Morality   | d) Integrity |
- 5) What is meant by the phrase CSR?
 

|                                     |
|-------------------------------------|
| a) Corporate Social Responsibility  |
| b) Company Social Responsibility    |
| c) Corporate Society Responsibility |
| d) Company Society Responsibility   |
- 6) Ethics should guide the technology towards \_\_\_\_\_.
 

|                      |                      |
|----------------------|----------------------|
| a) Political justice | b) Cultural justice  |
| c) Social justice    | d) None of the above |
- 7) The factor which affects ethical and unethical behavior is \_\_\_\_\_.
 

|                    |                       |
|--------------------|-----------------------|
| a) Ethical dilemma | b) Diversity          |
| c) Teamwork        | d) Open communication |

- 8) The hand-of-government refers to the
- a) ability of the government to interfere in business negotiations
  - b) role of corporations to be profitable within the law
  - c) effect of national politics on business decisions
  - d) impact of changing government regulations
- 9) Which of the following relating to CSR theories is correct?
- a) Institutional theory is based on the shareholder concept.
  - b) Social contract is the key concept of legitimacy theory.
  - c) The key concept of enlightened self-interest is stakeholder relations.
  - d) Stakeholder theory requires organizations to manage community perceptions to survive
- 10) The moral principles, standards of behavior, or set of values that guide a person's actions in the workplace is called
- a) Office place ethics
  - b) Factory place ethics
  - c) Behavioral ethics
  - d) Workplace ethics
- 11) Codes of conduct and codes of ethics
- a) are formal statements that describe what an organization expects of its employees.
  - b) become necessary only after a company has been in legal trouble.
  - c) are designed for top executives and managers, not regular employees.
  - d) rarely become an effective component of the ethics and compliance program.
- 12) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
- a) Integrity
  - b) Accountability
  - c) Openness
  - d) Acceptability
- 13) Which of the following would most effectively act as the primary objective of a business organization?
- a) To make a profit
  - b) To procure resources
  - c) To communicate with shareholders
  - d) To mediate between the organization and the environment
- 14) The four types of social responsibility include:
- a) legal, philanthropic, economic, and ethical
  - b) ethical, moral, social, and economic
  - c) philanthropic, justice, economic, and ethical
  - d) Legal, moral, ethical, and economic

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**Set****P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- a) Discuss various principles of ethics and its implications in the modern business world.
- b) Explain nature and need of business ethics.
- c) Explain the concept of corporate social responsibility (CSR).
- d) Mention the ethical issues that arise for managers.
- f) Explain the steps for setting standards of ethical behavior

**Q.3 Solve Any Two** **12**

- a) Explain 'Normative Ethics' in management.
- b) How are ethical decisions made? Which factors involved in decision making? Give an example.
- c) Explain forces inducing social responsibility, objectives and importance of CSR.

**Section – II**

**Q.4 Solve Any Four** **16**

- a) Explain ethical issues in the firm-employee relationship.
- b) Explain ethical and social issues in marketing.
- c) Explain the business ethics for pollution control.
- d) Explain the essential elements of corporate governance.
- e) Explain moral significance of information technology to business

**Q.5 Solve Any Two** **12**

- a) Explain the important parameters of environmental ethics.
- b) Explain ethical issues in the relation between business and government.
- c) Explain the relation between business ethics and environmental values.

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The hand-of-government refers to the
  - a) ability of the government to interfere in business negotiations
  - b) role of corporations to be profitable within the law
  - c) effect of national politics on business decisions
  - d) impact of changing government regulations
- 2) Which of the following relating to CSR theories is correct?
  - a) Institutional theory is based on the shareholder concept.
  - b) Social contract is the key concept of legitimacy theory.
  - c) The key concept of enlightened self-interest is stakeholder relations.
  - d) Stakeholder theory requires organizations to manage community perceptions to survive
- 3) The moral principles, standards of behavior, or set of values that guide a person's actions in the workplace is called
 

|                        |                         |
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| a) Office place ethics | b) Factory place ethics |
| c) Behavioral ethics   | d) Workplace ethics     |
- 4) Codes of conduct and codes of ethics
  - a) are formal statements that describe what an organization expects of its employees.
  - b) become necessary only after a company has been in legal trouble.
  - c) are designed for top executives and managers, not regular employees.
  - d) rarely become an effective component of the ethics and compliance program.
- 5) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
 

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| a) Integrity | b) Accountability |
| c) Openness  | d) Acceptability  |

- 6) Which of the following would most effectively act as the primary objective of a business organization?
- a) To make a profit
  - b) To procure resources
  - c) To communicate with shareholders
  - d) To mediate between the organization and the environment
- 7) The four types of social responsibility include:
- a) legal, philanthropic, economic, and ethical
  - b) ethical, moral, social, and economic
  - c) philanthropic, justice, economic, and ethical
  - d) Legal, moral, ethical, and economic
- 8) Which is not one of the natures of ethics?
- a) Focus on human values
  - b) Social work
  - c) Branch of philosophy
  - d) Applies moral principles
- 9) Why business ethics are important?
- a) It formulates the firm's image and builds the brand
  - b) It influences the buying decision of the customers
  - c) Build confidence within employees
  - d) All of the above
- 10) Which one of the following is not principle business ethics?
- a) Principle of universality
  - b) Principle of humanity
  - c) Principle of autonomy
  - d) Principle of dissatisfaction
- 11) Code of conduct does not include
- a) Dishonesty
  - b) Rules
  - c) Morality
  - d) Integrity
- 12) What is meant by the phrase CSR?
- a) Corporate Social Responsibility
  - b) Company Social Responsibility
  - c) Corporate Society Responsibility
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- 13) Ethics should guide the technology towards \_\_\_\_\_.
- a) Political justice
  - b) Cultural justice
  - c) Social justice
  - d) None of the above
- 14) The factor which affects ethical and unethical behavior is \_\_\_\_\_.
- a) Ethical dilemma
  - b) Diversity
  - c) Teamwork
  - d) Open communication

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday 09-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- a) Discuss various principles of ethics and its implications in the modern business world.
- b) Explain nature and need of business ethics.
- c) Explain the concept of corporate social responsibility (CSR).
- d) Mention the ethical issues that arise for managers.
- f) Explain the steps for setting standards of ethical behavior

**Q.3 Solve Any Two** **12**

- a) Explain 'Normative Ethics' in management.
- b) How are ethical decisions made? Which factors involved in decision making? Give an example.
- c) Explain forces inducing social responsibility, objectives and importance of CSR.

**Section – II**

**Q.4 Solve Any Four** **16**

- a) Explain ethical issues in the firm-employee relationship.
- b) Explain ethical and social issues in marketing.
- c) Explain the business ethics for pollution control.
- d) Explain the essential elements of corporate governance.
- e) Explain moral significance of information technology to business

**Q.5 Solve Any Two** **12**

- a) Explain the important parameters of environmental ethics.
- b) Explain ethical issues in the relation between business and government.
- c) Explain the relation between business ethics and environmental values.

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Codes of conduct and codes of ethics
  - a) are formal statements that describe what an organization expects of its employees.
  - b) become necessary only after a company has been in legal trouble.
  - c) are designed for top executives and managers, not regular employees.
  - d) rarely become an effective component of the ethics and compliance program.
- 2) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
  - a) Integrity
  - b) Accountability
  - c) Openness
  - d) Acceptability
- 3) Which of the following would most effectively act as the primary objective of a business organization?
  - a) To make a profit
  - b) To procure resources
  - c) To communicate with shareholders
  - d) To mediate between the organization and the environment
- 4) The four types of social responsibility include:
  - a) legal, philanthropic, economic, and ethical
  - b) ethical, moral, social, and economic
  - c) philanthropic, justice, economic, and ethical
  - d) Legal, moral, ethical, and economic
- 5) Which is not one of the natures of ethics?
  - a) Focus on human values
  - b) Social work
  - c) Branch of philosophy
  - d) Applies moral principles
- 6) Why business ethics are important?
  - a) It formulates the firm's image and builds the brand
  - b) It influences the buying decision of the customers
  - c) Build confidence within employees
  - d) All of the above

- 7) Which one of the following is not principle business ethics?  
a) Principle of universality      b) Principle of humanity  
c) Principle of autonomy      d) Principle of dissatisfaction
- 8) Code of conduct does not include  
a) Dishonesty      b) Rules  
c) Morality      d) Integrity
- 9) What is meant by the phrase CSR?  
a) Corporate Social Responsibility  
b) Company Social Responsibility  
c) Corporate Society Responsibility  
d) Company Society Responsibility
- 10) Ethics should guide the technology towards \_\_\_\_\_.  
a) Political justice      b) Cultural justice  
c) Social justice      d) None of the above
- 11) The factor which affects ethical and unethical behavior is \_\_\_\_\_.  
a) Ethical dilemma      b) Diversity  
c) Teamwork      d) Open communication
- 12) The hand-of-government refers to the  
a) ability of the government to interfere in business negotiations  
b) role of corporations to be profitable within the law  
c) effect of national politics on business decisions  
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- 13) Which of the following relating to CSR theories is correct?  
a) Institutional theory is based on the shareholder concept.  
b) Social contract is the key concept of legitimacy theory.  
c) The key concept of enlightened self-interest is stakeholder relations.  
d) Stakeholder theory requires organizations to manage community perceptions to survive
- 14) The moral principles, standards of behavior, or set of values that guide a person's actions in the workplace is called  
a) Office place ethics      b) Factory place ethics  
c) Behavioral ethics      d) Workplace ethics



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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- a) Discuss various principles of ethics and its implications in the modern business world.
- b) Explain nature and need of business ethics.
- c) Explain the concept of corporate social responsibility (CSR).
- d) Mention the ethical issues that arise for managers.
- f) Explain the steps for setting standards of ethical behavior

**Q.3 Solve Any Two** **12**

- a) Explain 'Normative Ethics' in management.
- b) How are ethical decisions made? Which factors involved in decision making? Give an example.
- c) Explain forces inducing social responsibility, objectives and importance of CSR.

**Section – II**

**Q.4 Solve Any Four** **16**

- a) Explain ethical issues in the firm-employee relationship.
- b) Explain ethical and social issues in marketing.
- c) Explain the business ethics for pollution control.
- d) Explain the essential elements of corporate governance.
- e) Explain moral significance of information technology to business

**Q.5 Solve Any Two** **12**

- a) Explain the important parameters of environmental ethics.
- b) Explain ethical issues in the relation between business and government.
- c) Explain the relation between business ethics and environmental values.

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Ethics should guide the technology towards \_\_\_\_\_.  
a) Political justice                      b) Cultural justice  
c) Social justice                         d) None of the above
- 2) The factor which affects ethical and unethical behavior is \_\_\_\_\_.  
a) Ethical dilemma                      b) Diversity  
c) Teamwork                              d) Open communication
- 3) The hand-of-government refers to the  
a) ability of the government to interfere in business negotiations  
b) role of corporations to be profitable within the law  
c) effect of national politics on business decisions  
d) impact of changing government regulations
- 4) Which of the following relating to CSR theories is correct?  
a) Institutional theory is based on the shareholder concept.  
b) Social contract is the key concept of legitimacy theory.  
c) The key concept of enlightened self-interest is stakeholder relations.  
d) Stakeholder theory requires organizations to manage community perceptions to survive
- 5) The moral principles, standards of behavior, or set of values that guide a person's actions in the workplace is called  
a) Office place ethics                      b) Factory place ethics  
c) Behavioral ethics                        d) Workplace ethics
- 6) Codes of conduct and codes of ethics  
a) are formal statements that describe what an organization expects of its employees.  
b) become necessary only after a company has been in legal trouble.  
c) are designed for top executives and managers, not regular employees.  
d) rarely become an effective component of the ethics and compliance program.

- 7) Which of the following is not one of the underlying principles of the corporate governance Combined Code of Practice?
- a) Integrity
  - b) Accountability
  - c) Openness
  - d) Acceptability
- 8) Which of the following would most effectively act as the primary objective of a business organization?
- a) To make a profit
  - b) To procure resources
  - c) To communicate with shareholders
  - d) To mediate between the organization and the environment
- 9) The four types of social responsibility include:
- a) legal, philanthropic, economic, and ethical
  - b) ethical, moral, social, and economic
  - c) philanthropic, justice, economic, and ethical
  - d) Legal, moral, ethical, and economic
- 10) Which is not one of the natures of ethics?
- a) Focus on human values
  - b) Social work
  - c) Branch of philosophy
  - d) Applies moral principles
- 11) Why are business ethics important?
- a) It formulates the firm's image and builds the brand
  - b) It influences the buying decision of the customers
  - c) Build confidence within employees
  - d) All of the above
- 12) Which one of the following is not a principle of business ethics?
- a) Principle of universality
  - b) Principle of humanity
  - c) Principle of autonomy
  - d) Principle of dissatisfaction
- 13) Code of conduct does not include
- a) Dishonesty
  - b) Rules
  - c) Morality
  - d) Integrity
- 14) What is meant by the phrase CSR?
- a) Corporate Social Responsibility
  - b) Company Social Responsibility
  - c) Corporate Society Responsibility
  - d) Company Society Responsibility

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**Set S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday 09-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- a) Discuss various principles of ethics and its implications in the modern business world.
- b) Explain nature and need of business ethics.
- c) Explain the concept of corporate social responsibility (CSR).
- d) Mention the ethical issues that arise for managers.
- f) Explain the steps for setting standards of ethical behavior

**Q.3 Solve Any Two** **12**

- a) Explain 'Normative Ethics' in management.
- b) How are ethical decisions made? Which factors involved in decision making? Give an example.
- c) Explain forces inducing social responsibility, objectives and importance of CSR.

**Section – II**

**Q.4 Solve Any Four** **16**

- a) Explain ethical issues in the firm-employee relationship.
- b) Explain ethical and social issues in marketing.
- c) Explain the business ethics for pollution control.
- d) Explain the essential elements of corporate governance.
- e) Explain moral significance of information technology to business

**Q.5 Solve Any Two** **12**

- a) Explain the important parameters of environmental ethics.
- b) Explain ethical issues in the relation between business and government.
- c) Explain the relation between business ethics and environmental values.

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Set **P**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is considered production Economics?
  - a) Tilling of Soil
  - b) Singing a song before friends
  - c) Preventing a child from falling into a manhole on the road
  - d) Painting a Picture for Pleasure
- 2) Macroeconomics is also called \_\_\_\_\_ Economics.
  - a) Applied
  - b) Aggregate
  - c) Experimental
  - d) None of the above
- 3) In Economics we use the term scarcity to mean \_\_\_\_\_.
  - a) Abstract scarcity and lack of resource in less developed countries.
  - b) Relative scarcity i.e. scarcity in relation to the wants of the society
  - c) Scarcity during times of business failure and natural calamities
  - d) Scarcity caused on account of excessive consumption by the rich
- 4) The Short run, as economists use the phrase, is characterized by \_\_\_\_\_.
  - a) At least one fixed factor of production and firms neither leaving nor entering the industry.
  - b) Generally a period which, is shorter than one year.
  - c) All factors of production are fixed and no variable inputs
  - d) All inputs are variable and production is done in less than one year
- 5) Tie Marginal, Average and Total Product Curves encountered by the firm production in the short run exhibit all of the following relationship except: \_\_\_\_\_.
  - a) When total product rising, average and marginal product may be either rising or falling
  - b) When marginal product is negative, total product and average product are falling
  - c) When average product is at a maximum, marginal product equals average product, and total product, is rising.
  - d) When marginal product is at a maximum, average product equals marginal product, and total product is rising.

- 6) Business economics is \_\_\_\_\_.  
a) Abstract and applies the tools of Microeconomics  
b) Involves practice application of economic theory in business decision making.  
c) Incorporates tools from multiple disciplines  
d) (b) and (c) above
- 7) An example of 'Positive' Economic analysis would be: \_\_\_\_\_.  
a) An Analysis of the relationship between the price of food and the quantity purchased  
b) Determining how much income each person should be Guaranteed  
c) Determining the 'Fair' Price for food  
d) Deciding how to distribute the output of the economy
- 8) Which of the following pairs of goods is an example of substitutes?  
a) Tea and sugar  
b) Tea and coffee  
c) Pen and ink  
d) Shirts trousers
- 9) Which of the following does not suggest a Macro Approach for India?  
a) Determining the GNP of India  
b) Finding the causes of; failure of ABC Ltd.  
c) Identifying the causes of inflation in India  
d) Analyze the causes of failure of Industry in providing large scale employment
- 10) The Law of Demand, assuming other things to remain constant, establishes the relationship between:  
a) Income of the consumer and the quantity of a good demanded by him  
b) Price of a good and the Quantity demanded  
c) Price of a Good and the demand for its substitute  
d) Quantity demanded of a Good and the relative Prices of its complementary goods
- 11) Identify the Factor which Generally keeps the Price-Elasticity of demand for a Good low:  
a) Variety of uses for that good  
b) Very low Price of a Commodity  
c) Close Substitute for that Good  
d) High Proportion of the Consumer's Income spent on it.
- 12) Which of the following is a normative statement?  
a) Planned economies allocate resources via government department  
b) Most transitional economies have experienced problems of falling output and rising prices over past decade.  
c) There is a greater degree of consumer sovereignty in market economies than planned ' economies  
d) Reducing inequality should be major priority for mixed economies
- 13) In the case of an inferior good, the Income elasticity of demand is:  
a) Positive  
b) Zero  
c) Negative  
d) Infinite
- 14) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:  
a) 0  
b) 1  
c) 1.5  
d) 2

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What are the Basic Functions of Business Managers? How does Economics help Business managers in Performing their Functions?
- b) Define Managerial Economics and Discuss its Scope, what is the importance of Managerial Economics.
- c) What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and Illustrate Graphically.
- d) What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions?
- e) Explain Arc elasticity graph and discuss Problems in using Arc elasticity.

**Q.3 Solve Any Two.** **12**

- a) What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?
- b) What is the expectation in law of demand? Explain "Griffin Goods"
- c) What is meant by Utility? What are the Conditions for Application of Law of Diminishing Utility?

**Section – II**

**Q.4 Solve any four.** **16**

- a) Define and Distinguish between Arc Elasticity and Point Elasticity.
- b) What are the opinion Poll method and Delphi Method?
- c) State and Illustrate Cobb-Douglas Production Function. What are the properties of Cobb-Douglas Production Function?
- d) What is Opportunity Cost? Give some examples of Opportunity Cost.
- e) What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- f) What is Opportunity Cost? Give some examples of Opportunity Cost.

**Q.5 Solve Any Two.** **12**

- a) Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- b) Explain the assumptions and Limitations at breakeven Analysis.
- c) Explain Following Cost Concepts with examples.
 

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| 1) Variable cost | 3) Explicit cost |
| 2) Fixed cost    | 4) Implicit cost |

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Set **Q**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

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- 1) Which of the following pairs of goods is an example of substitutes?
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  - c) Negative
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  - c) Determining the 'Fair' Price for food
  - d) Deciding how to distribute the output of the economy

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Set **Q**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Solve any four.** **16**

- a) What are the Basic Functions of Business Managers? How does Economics help Business managers in Performing their Functions?
- b) Define Managerial Economics and Discuss its Scope, what is the importance of Managerial Economics.
- c) What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and Illustrate Graphically.
- d) What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions?
- e) Explain Arc elasticity graph and discuss Problems in using Arc elasticity.

**Q.3 Solve Any Two.** **12**

- a) What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?
- b) What is the expectation in law of demand? Explain "Griffin Goods"
- c) What is meant by Utility? What are the Conditions for Application of Law of Diminishing Utility?

**Section – II**

**Q.4 Solve any four.** **16**

- a) Define and Distinguish between Arc Elasticity and Point Elasticity.
- b) What are the opinion Poll method and Delphi Method?
- c) State and Illustrate Cobb-Douglas Production Function. What are the properties of Cobb-Douglas Production Function?
- d) What is Opportunity Cost? Give some examples of Opportunity Cost.
- e) What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- f) What is Opportunity Cost? Give some examples of Opportunity Cost.

**Q.5 Solve Any Two.** **12**

- a) Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- b) Explain the assumptions and Limitations at breakeven Analysis.
- c) Explain Following Cost Concepts with examples.
 

|                  |                  |
|------------------|------------------|
| 1) Variable cost | 3) Explicit cost |
| 2) Fixed cost    | 4) Implicit cost |

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Set **R**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Identify the Factor which Generally keeps the Price-Elasticity of demand for a Good low:
  - a) Variety of uses for that good
  - b) Very low Price of a Commodity
  - c) Close Substitute for that Good
  - d) High Proportion of the Consumer's Income spent on it.
- 2) Which of the following is a normative statement?
  - a) Planned economies allocate resources via government department
  - b) Most transitional economies have experienced problems of falling output and rising prices over past decade.
  - c) There is a greater degree of consumer sovereignty in market economies than planned ' economies
  - d) Reducing in inequality should be major priority for mixed economies
- 3) In the case of an inferior good, the Income elasticity of demand is:
  - a) Positive
  - b) Zero
  - c) Negative
  - d) Infinite
- 4) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
  - a) 0
  - b) 1
  - c) 1.5
  - d) 2
- 5) Which of the following is considered production Economics?
  - a) Tilling of Soil
  - b) Singing a song before friends
  - c) Preventing a child from falling into a manhole on the road
  - d) Painting a Picture for Pleasure
- 6) Macroeconomics is also called \_\_\_\_\_ Economics.
  - a) Applied
  - b) Aggregate
  - c) Experimental
  - d) None of the above

- 7) In Economics we use the term scarcity to mean \_\_\_\_\_.  
a) Abstract scarcity and lack of resource in less developed countries.  
b) Relative scarcity i.e. scarcity in relation to the wants of the society  
c) Scarcity during times of business failure and natural calamities  
d) Scarcity caused on account of excessive consumption by the rich
- 8) The Short run, as economists use the phrase, is characterized by \_\_\_\_\_.  
a) At least one fixed factor of production and firms neither leaving nor entering the industry.  
b) Generally a period which, is shorter than one year.  
c) All factors of production are fixed and no variable inputs  
d) All inputs are variable and production is done in less than one year
- 9) The Marginal, Average and Total Product Curves encountered by the firm production in the short run exhibit all of the following relationship except: \_\_\_\_\_.  
a) When total product rising, average and marginal product may be either rising or falling  
b) When marginal product is negative, total product and average product are falling  
c) When average product is at a maximum, marginal product equals average product, and total product, is rising.  
d) When marginal product is at a maximum, average product equals marginal product, and total product is rising.
- 10) Business economics is \_\_\_\_\_.  
a) Abstract and applies the tools of Microeconomics  
b) Involves practice application of economic theory in business decision making.  
c) Incorporates tools from multiple disciplines  
d) (b) and (c) above
- 11) An example of 'Positive' Economic analysis would be: \_\_\_\_\_.  
a) An Analysis of the relationship between the price of food and the quantity purchased  
b) Determining how much income each person should be Guaranteed  
c) Determining the 'Fair' Price for food  
d) Deciding how to distribute the output of the economy
- 12) Which of the following pairs of goods is an example of substitutes?  
a) Tea and sugar  
b) Tea and coffee  
c) Pen and ink  
d) Shirts trousers
- 13) Which of the following does not suggest a Macro Approach for India?  
a) Determining the GNP of India  
b) Finding the causes of; failure of ABC Ltd.  
c) Identifying the causes of inflation in India  
d) Analyze the causes of failure of Industry in providing large scale employment
- 14) The Law of Demand, assuming other things to remain constant, establishes the relationship between:  
a) Income of the consumer and the quantity of a good demanded by him  
b) Price of a good and the Quantity demanded  
c) Price of a Good and the demand for its substitute  
d) Quantity demanded of a Good and the relative Prices of its complementary goods

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Set **R**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What are the Basic Functions of Business Managers? How does Economics help Business managers in Performing their Functions?
- b) Define Managerial Economics and Discuss its Scope, what is the importance of Managerial Economics.
- c) What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and Illustrate Graphically.
- d) What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions?
- e) Explain Arc elasticity graph and discuss Problems in using Arc elasticity.

**Q.3 Solve Any Two.** **12**

- a) What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?
- b) What is the expectation in law of demand? Explain "Griffin Goods"
- c) What is meant by Utility? What are the Conditions for Application of Law of Diminishing Utility?

**Section – II**

**Q.4 Solve any four.** **16**

- a) Define and Distinguish between Arc Elasticity and Point Elasticity.
- b) What are the opinion Poll method and Delphi Method?
- c) State and Illustrate Cobb-Douglas Production Function. What are the properties of Cobb-Douglas Production Function?
- d) What is Opportunity Cost? Give some examples of Opportunity Cost.
- e) What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- f) What is Opportunity Cost? Give some examples of Opportunity Cost.

**Q.5 Solve Any Two.** **12**

- a) Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- b) Explain the assumptions and Limitations at breakeven Analysis.
- c) Explain Following Cost Concepts with examples.
 

|                  |                  |
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| 1) Variable cost | 3) Explicit cost |
| 2) Fixed cost    | 4) Implicit cost |

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Set **S**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) Business economics is \_\_\_\_\_.
  - a) Abstract and applies the tools of Microeconomics
  - b) Involves practice application of economic theory in business decision making.
  - c) Incorporates tools from multiple disciplines
  - d) (b) and (c) above
- 2) An example of 'Positive' Economic analysis would be: \_\_\_\_\_.
  - a) An Analysis of the relationship between the price of food and the quantity purchased
  - b) Determining how much income each person should be Guaranteed
  - c) Determining the 'Fair' Price for food
  - d) Deciding how to distribute the output of the economy
- 3) Which of the following pairs of goods is an example of substitutes?
  - a) Tea and sugar
  - b) Tea and coffee
  - c) Pen and ink
  - d) Shirts trousers
- 4) Which of the following does not suggest a Macro Approach for India?
  - a) Determining the GNP of India
  - b) Finding the causes of; failure of ABC Ltd.
  - c) Identifying the causes of inflation in India
  - d) Analyze the causes of failure of Industry in providing large scale employment
- 5) The Law of Demand, assuming other things to remain constant, establishes the relationship between:
  - a) Income of the consumer and the quantity of a good demanded by him
  - b) Price of a good and the Quantity demanded
  - c) Price of a Good and the demand for its substitute
  - d) Quantity demanded of a Good and the relative Prices of its complementary goods

- 6) Identify the Factor which Generally keeps the Price-Elasticity of demand for a Good low:
- Verify of uses for that good
  - Very low Price of a Commodity
  - Close Substitute for that Good
  - High Proportion of the Consumer's Income spent on it.
- 7) Which of the following is a normative statement?
- Planned economies allocate resources via government department
  - Most transitional economies have experienced problems of falling output and rising prices our past decade.
  - There is a greater degree of consumer sovereignty in market economies than planned ' economies
  - Reducing in inequality should be major priority for mixed economies
- 8) In the case of an inferior good, the Income elasticity of demand is:
- Positive
  - Zero
  - Negative
  - Infinite
- 9) In the case of a straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:
- 0
  - 1
  - 1.5
  - 2
- 10) Which of the following is considered production Economics?
- Tilling of Soil
  - Singing a song before friends
  - Preventing a child from falling into a manhole on the road
  - Painting a Picture for Pleasure
- 11) Macroeconomics is also called \_\_\_\_\_ Economics.
- Applied
  - Aggregate
  - Experimental
  - None of the above
- 12) In Economics we use the term scarcity to mean \_\_\_\_\_.
- Abstract scarcity and lack of resource in less developed countries.
  - Relative scarcity i.e. scarcity in relation to the wants of the society
  - Scarcity during times of business failure and natural calamities
  - Scarcity caused on account of excessive consumption by the rich
- 13) The Short run, as economists use the phrase, is characterized by \_\_\_\_\_.
- At least one fixed factor of production and firms neither leaving nor entering the industry.
  - Generally a period which, is shorter than one year.
  - All factors of production are fixed and no variable inputs
  - All inputs are variable and production is done in less than one year
- 14) Tie Marginal, Average and Total Product Curves encountered by the firm production in the short run exhibit all of the following relationship except: \_\_\_\_.
- When total product rising, average and marginal product may be either rising or falling
  - When marginal product is negative, total product and average product are falling
  - When average product is at a maximum, marginal product equals average product, and total product, is rising.
  - When marginal product is at a maximum, average product equals marginal product, and total product is rising.

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Set **S**

**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What are the Basic Functions of Business Managers? How does Economics help Business managers in Performing their Functions?
- b) Define Managerial Economics and Discuss its Scope, what is the importance of Managerial Economics.
- c) What is the condition for Consumer Equilibrium under Ordinal utility approach to consumer analysis? Explain and Illustrate Graphically.
- d) What is the Major Area of Business Decision Making? How does Economic theory Contribute to Managerial decisions?
- e) Explain Arc elasticity graph and discuss Problems in using Arc elasticity.

**Q.3 Solve Any Two.** **12**

- a) What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?
- b) What is the expectation in law of demand? Explain "Griffin Goods"
- c) What is meant by Utility? What are the Conditions for Application of Law of Diminishing Utility?

**Section – II**

**Q.4 Solve any four.** **16**

- a) Define and Distinguish between Arc Elasticity and Point Elasticity.
- b) What are the opinion Poll method and Delphi Method?
- c) State and Illustrate Cobb-Douglas Production Function. What are the properties of Cobb-Douglas Production Function?
- d) What is Opportunity Cost? Give some examples of Opportunity Cost.
- e) What is Linear Programming? Discuss usefulness of its application to Practical Business problems.
- f) What is Opportunity Cost? Give some examples of Opportunity Cost.

**Q.5 Solve Any Two.** **12**

- a) Explain and illustrate the relationship Between Marginal Cost, Average Cost and Total Cost Assuming a short run non linear cost function?
- b) Explain the assumptions and Limitations at breakeven Analysis.
- c) Explain Following Cost Concepts with examples.
 

|                  |                  |
|------------------|------------------|
| 1) Variable cost | 3) Explicit cost |
| 2) Fixed cost    | 4) Implicit cost |



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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4** Discuss the features of new economic policy in India. **10**
- Q.5** Explain the properties of perfect and imperfectly competitive market. **10**
- Q.6** Define national income. Explain the methods of measuring national income. **10**
- Q.7** Define central bank, discuss the function of central banking in India. **10**

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

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|------------------------------------------------------------------------------------------|---------------|
| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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Set **R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.  
a) which can be only changed in the long run  
b) which can be changed in the short run  
c) which can be never be changed  
d) All of the above
- 10) Which one of the following is not the function of money?  
a) Medium of exchange  
b) Measure of Happiness  
c) Standard of deferred payment  
d) Store of value



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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |                                                                                          |               |
|------------------------------------------------------------------------------------------|---------------|
| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-348**

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4** Discuss the features of new economic policy in India. **10**
- Q.5** Explain the properties of perfect and imperfectly competitive market. **10**
- Q.6** Define national income. Explain the methods of measuring national income. **10**
- Q.7** Define central bank, discuss the function of central banking in India. **10**

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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850

- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is the subject matter of a patent?
 

|          |              |
|----------|--------------|
| a) Art   | b) Invention |
| c) Goods | d) Ideas     |
- 2) What is copyright meant for?
 

|              |                 |
|--------------|-----------------|
| a) Film work | b) Books        |
| c) Essay     | d) All of these |
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

|                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

|         |         |
|---------|---------|
| a) 1856 | b) 1880 |
| c) 1905 | d) 1850 |
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

|              |               |
|--------------|---------------|
| a) Copyright | b) Patents    |
| c) Contracts | d) Trademarks |
- 6) Which is not a type of intellectual property?
 

|                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 7) In which article is intellectual property rights outlined?
 

|               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |
- 8) How long does intellectual property last? (after the death of the author)
 

|           |           |
|-----------|-----------|
| a) 10 yrs | b) 30 yrs |
| c) 60 yrs | d) 70 yrs |
- 9) Which of the following can you copyright?
 

|                       |            |
|-----------------------|------------|
| a) Literary work      | b) Ideas   |
| c) Choreographic work | d) Fashion |



- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

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| <b>Set</b> | <b>Q</b> |
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks:10

10

- Page 7 of 12

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

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**Set R**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Set **S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

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**Set S**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works



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Set **P**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

|                 |              |
|-----------------|--------------|
| a) August Comte | b) Srinivas  |
| c) Ghurye       | d) Aristotle |
- 2) What is culture?
 

|                 |                |
|-----------------|----------------|
| a) literature   | b) way of life |
| c) food rituals | d) fashions    |
- 3) What is social norm?
 

|                       |                |
|-----------------------|----------------|
| a) social conventions | b) social laws |
| c) dos and don'ts     | d) governance  |
- 4) What is demography?
 

|                          |                       |
|--------------------------|-----------------------|
| a) science of society    | b) study of migration |
| c) science of population | d) study of races     |
- 5) Which of the following is applicable to tribal community?
 

|             |                |
|-------------|----------------|
| a) Religion | b) Culture     |
| c) Songs    | d) Homogeneity |
- 6) Who was the leader of the Narmada bachao movement?
 

|                  |                 |
|------------------|-----------------|
| a) Anna Hajare   | b) Medha Patkar |
| c) H.N. Bahuguna | d) Kejriwal     |
- 7) Who is the founder of Satyashodhak samaj?
 

|                 |                     |
|-----------------|---------------------|
| a) Vinoba Bhave | b) Mahatma Phule    |
| c) M. Gandhi    | d) Rajaram Mohanroy |
- 8) Which is distinctive nature of family?
 

|                   |                    |
|-------------------|--------------------|
| a) Small family   | b) Large family    |
| c) Bilateral unit | d) Unilateral unit |
- 9) What is the percentage of potable water on the earth?
 

|       |       |
|-------|-------|
| a) 2% | b) 3% |
| c) 5% | d) 7% |
- 10) Which of the following is the reformist movement?
 

|                       |                             |
|-----------------------|-----------------------------|
| a) Chipko movement    | b) Non-cooperation movement |
| c) Anti-Sati movement | d) Freedom movement         |

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**ELECTRICAL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

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| <b>Set Q</b> |
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022

**ELECTRICAL ENGINEERING****Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 2) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 3) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 4) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 5) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 6) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 7) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**

**ELECTRICAL ENGINEERING**

**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

|                       |                |
|-----------------------|----------------|
| a) social conventions | b) social laws |
| c) dos and don'ts     | d) governance  |
- 2) What is demography?
 

|                          |                       |
|--------------------------|-----------------------|
| a) science of society    | b) study of migration |
| c) science of population | d) study of races     |
- 3) Which of the following is applicable to tribal community?
 

|             |                |
|-------------|----------------|
| a) Religion | b) Culture     |
| c) Songs    | d) Homogeneity |
- 4) Who was the leader of the Narmada bachao movement?
 

|                  |                 |
|------------------|-----------------|
| a) Anna Hajare   | b) Medha Patkar |
| c) H.N. Bahuguna | d) Kejriwal     |
- 5) Who is the founder of Satyashodhak samaj?
 

|                 |                     |
|-----------------|---------------------|
| a) Vinoba Bhave | b) Mahatma Phule    |
| c) M. Gandhi    | d) Rajaram Mohanroy |
- 6) Which is distinctive nature of family?
 

|                   |                    |
|-------------------|--------------------|
| a) Small family   | b) Large family    |
| c) Bilateral unit | d) Unilateral unit |
- 7) What is the percentage of potable water on the earth?
 

|       |       |
|-------|-------|
| a) 2% | b) 3% |
| c) 5% | d) 7% |
- 8) Which of the following is the reformist movement?
 

|                       |                             |
|-----------------------|-----------------------------|
| a) Chipko movement    | b) Non-cooperation movement |
| c) Anti-Sati movement | d) Freedom movement         |
- 9) Who is the father of Indology?
 

|                 |              |
|-----------------|--------------|
| a) August Comte | b) Srinivas  |
| c) Ghurye       | d) Aristotle |
- 10) What is culture?
 

|                 |                |
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| a) literature   | b) way of life |
| c) food rituals | d) fashions    |

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**



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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

**10**

- Page 1 of 12

- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
|-----------------|-------------|
| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |                                                                  |           |
|------------|------------------------------------------------------------------|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

10

- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
|----------------------------|----------------------|
| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |

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| <b>Set</b> | <b>Q</b> |
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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |                                                                  |           |
|------------|------------------------------------------------------------------|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_\_.  
a) Put it aside till later      b) Drink alcohol to relax  
c) Break it down into smaller task      d) Avoid the task



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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

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| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
|--------------------|-------------------|
| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

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**T.Y (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

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|------------|------------------------------------------------------------------|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks

Marks:10

10

- Page 1 of 12

- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication



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| <b>Set Q</b> |
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
 

|                    |                        |
|--------------------|------------------------|
| a) Integrity       | b) Work ethic          |
| c) Personal Values | d) Professional values |
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
 

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| a) Confidentiality | b) Empathy     |
| c) Ethics          | d) Work ethics |
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
 

|            |          |
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| a) Culture | b) Value |
| c) Society | d) Moral |
- 4) Virtues are \_\_\_\_\_.
 

|           |                                  |
|-----------|----------------------------------|
| a) Moral  | b) Ethics                        |
| c) Values | d) Positive and preferred values |
- 5) Honestly is a \_\_\_\_\_.
 

|                    |                  |
|--------------------|------------------|
| a) Virtue          | b) Truthfulness  |
| c) Trustworthiness | d) Communication |
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
 

|           |             |
|-----------|-------------|
| a) Nature | b) Nurture  |
| c) World  | d) Universe |
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
 

|          |               |
|----------|---------------|
| a) Happy | b) Sad        |
| c) Laugh | d) Earn money |
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
 

|                                               |  |
|-----------------------------------------------|--|
| a) Self-confidence                            |  |
| b) Risks and difficult tasks in rational ways |  |
| c) Physical courage                           |  |
| d) Social courage                             |  |
- 9) Commitment means \_\_\_\_\_.
 

|                       |                                    |
|-----------------------|------------------------------------|
| a) Alignment to goals | b) Adherence to ethical principles |
| c) Empathy            | d) All the above                   |

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

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| <b>Set</b> | <b>R</b> |
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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 2) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 4) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 5) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above
- 6) The objectives of professional ethics in engineering are
  - a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

- 9) Ethics has evolved with evaluation of \_\_\_\_\_.  
a) Culture  
b) Value  
c) Society  
d) Moral
- 10) Virtues are \_\_\_\_\_.  
a) Moral  
b) Ethics  
c) Values  
d) Positive and preferred values

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**T.Y. (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2** List the human values and explain any two in detail. **10**

**OR**

Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.

**Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**

**OR**

Explain the role of engineers as manager.

**Q.4** Write short notes on any four **20**

- a) Objectives of Engineering Ethics
- b) Self confidence
- c) Commitment
- d) Difference between moral and ethics
- e) Intellectual property rights
- f) Code of ethics



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Day & Date: Wednesday, 25-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries on mark.

- 1) Range of accelerating factor is \_\_\_\_\_.  
a) 50 to 100                      b) 1 to 10  
c) 1.6 to 1.8                     d) 10.8 to 11.2
- 2) For n bus power system size of Y bus matrix is \_\_\_\_\_.  
a)  $(n-1) \times (n-1)$                 b)  $(n-2) \times (n-2)$   
c)  $n \times n$                               d)  $(n-1) \times (n-2)$
- 3) Which among the following methods are generally used for the calculation of symmetrical faults?  
a) Norton theorem                  b) Thevenin's theorem  
c) Kirchhoff's laws                d) Only (b) and (c)
- 4) Which of the following fault results into a three phase faults?  
a) Single line to ground fault  
b) Double line to ground fault  
c) Line to line fault  
d) Fault due to all the three phases to earth
- 5) In what direction does the phasor get rotated if it is multiplied by the operator 'a'?  
a) Anti-clockwise  
b) Clockwise  
c) gets rotated by  $90^\circ$  in the clockwise direction  
d) gets rotated by  $90^\circ$  in the anticlockwise direction
- 6) The Critical Clearance time of a fault in the power system is related to \_\_\_\_\_.  
a) Reactive power limit            b) Short Circuit limit  
c) Steady state stability limit      d) Transient stability limit
- 7) Fault level means \_\_\_\_\_.  
a) Fault Current                      b) Voltage at the point of fault  
c) Fault MVA                         d) Fault power factor



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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System – III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any four from following question.**

**16**

- A generating station has five section bus-bar connected with a tie-bar through 7-5% reactors rated at 3000 kVA. Each generator is of 3000 kVA. with 10% reactance and is connected to one section of the bus-bar. Find the total steady input to a dead short-circuit between the lines on one of the sections of the bus-bars with reactors.
- Explain clearly the computational procedure for load flow solution using Decoupled method.
- With the help of sample power system explain step by step method for formation of Y bus using singular Transformation.
- Derive and explain static load flow equation.
- Three generators are rated as follows: Generator 1-100 MVA, 35 kV, reactance 10%; Generator 2- 200 MVA, 32 kV, reactance 8%; Generator 3-200 MVA, 35 kV, and reactance 12%. Determine the reactance of the generator corresponding to base Values of 200 MVA, 35 kV.
- A 3-phase, 20 MVA, 11 kV alternator has internal reactance of 5% and negligible resistance. Find the external reactance per phase to be connected in series with the alternator so that steady current on short circuit does not exceed six times the full load current.

**Q.3 Attempt any two of the following questions.**

**12**

- Explain clearly the computational procedure for load flow solution using NR method when the system contains all type of buses.
- The following is the system data for a load flow solution: The line admittances:

| Bus code | Admittance   |
|----------|--------------|
| 1-2      | 2-j8.0       |
| 1-3      | 1-j4.0       |
| 2-3      | 0.666-j2.664 |
| 2-4      | 1-j4.0       |
| 3-4      | 2-j8.0       |

The schedule of active and reactive powers:

| Bus code | P   | Q   | V      | Remarks |
|----------|-----|-----|--------|---------|
| 1        | -   | -   | 1.06   | Slack   |
| 2        | 0.5 | 0.2 | 1+j0.0 | PQ      |
| 3        | 0.4 | 0.3 | 1+j0.0 | PQ      |
| 4        | 0.3 | 0.1 | 1+j0.0 | PQ      |

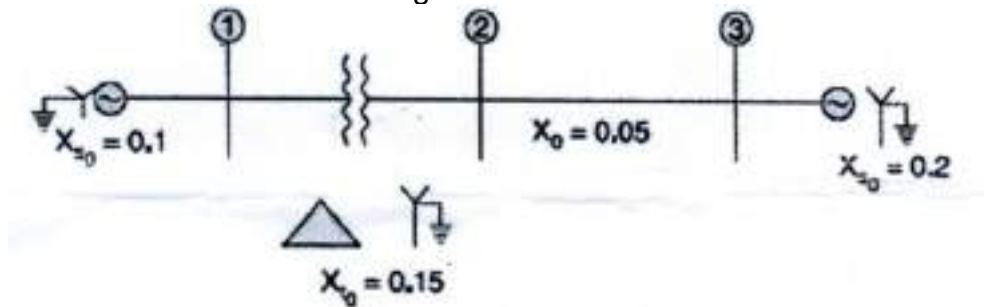
Determine the voltage at the end of first iteration using Gauss-Seidel method. Take  $\alpha = 1.6$ .

- c) Obtain a step by step programmable technique for building a complete Z bus of the given system.

### Section – II

**Q.4 Answer any four of the following question.**

- a) The current from neutral to ground connection is 12 A. Calculate the zero phase sequence components in phases. 16
- b) The zero sequence reactances (in p.u) are indicated in the network shown in the figure. Determine the value of zero sequence driving – point reactance at node 3 shown in fig.



- c) Determine the fault currents in each phase following a double line-to-ground short circuit at the terminals of a star-connected synchronous generator operating initially on an open circuit voltage of 1 pu. The positive, negative and zero sequence reactance of the generator are, respectively,  $j0.35$ ,  $j0.25$  and  $j0.20$ , and its star point is isolated from ground.
- d) Explain with sequence network various open conductor faults on the power system.
- e) Prove That
- 1)  $\frac{1 - a^2}{a - a^2} = -a$
  - 2)  $\frac{1 - a}{a + a^2} = 1 - a^2$

Where  $a$  and  $a^2$  are vector operators.

- f) Derive swing equation and discuss its importance in power system stability.

**Q.5 Answer any two of the following question.**

- a)** Three 6.6 kV, 12 MVA, 3-phase alternators are connected to a common set of busbars. The positive, negative and zero sequence impedances of each alternator are 15%, 12% and 4.5% respectively. If an earth fault occurs on one busbar, determine the fault current: **12**
- 1) If all the alternator neutrals are solidly grounded
  - 2) If only one of the alternator neutrals is solidly earthed and the others are isolated
  - 3) If one of the alternator neutrals is earthed through a reactance of 0.5 ohm and the others are isolated.
- b)** Derive an expression with sequence network of the system when
- 1) line to line (LL) fault on generator
  - 2) LLG fault on generator
- c)** Three resistors of  $5\Omega$ ,  $10\Omega$  and  $20\Omega$  are connected in delta across the three phases of a balanced 100 volts supply. What are the sequence components in the resistors and in supply lines?

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No.**

Max. Marks: 70

- 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary and mention it clearly.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The impedance per phase of 3-phase transmission line on a base of 100 MV A, 100 kV is 2 PV, the value of this impedance on a base of 400 MVA and 400 kV would be \_\_\_\_\_.  
a) 1.5 pu                      b) 1.0 pu  
c) 0.5 pu                     d) 0.25 pu
- 2) In a circuit the voltage and current are given by  $v = (10 + j5)$  and  $I = (6 + j4)$ . The circuit is \_\_\_\_\_.  
a) inductive                  b) Capacitive  
c) resistive                d) it could be any of the above
- 3) If a new line is added between the buses 2 and 3 in a system, the elements of Y Bus affected by addition of this line are \_\_\_\_\_.  
a) Y22, Y33,                  b) Y22, Y23, Y32, Y33  
c) Y23, Y32,                d) None of the above
- 4) At a particular unbalanced node, the real powers specified are: Leaving the node 20 MW, 25 MW Entering the node 60 MW, 30 MW The balancing power will be:  
a) 30 MW leaving the node  
b) 45 MW leaving the node  
c) 45 MW entering the node  
d) 22.5 MW entering the node and 22.5 MW leaving the node
- 5) For a 15-bus power system with 3 voltage controlled bus, the size of Jacobian matrix is \_\_\_\_\_.  
a)  $11 \times 11$                       b)  $12 \times 12$   
c)  $24 \times 24$                      d)  $28 \times 28$
- 6) A three-phase, 33 kV oil circuit breaker is rated 1200 A, 2000 MVA, 3 s. The symmetrical breaking current is \_\_\_\_\_.  
a) 1200 A                      b) 3600 A  
c) 35 KA                      d) 104.8 KA



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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System – III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any four from following question.**

**16**

- A generating station has five section bus-bar connected with a tie-bar through 7-5% reactors rated at 3000 kVA. Each generator is of 3000 kVA. with 10% reactance and is connected to one section of the bus-bar. Find the total steady input to a dead short-circuit between the lines on one of the sections of the bus-bars with reactors.
- Explain clearly the computational procedure for load flow solution using Decoupled method.
- With the help of sample power system explain step by step method for formation of Y bus using singular Transformation.
- Derive and explain static load flow equation.
- Three generators are rated as follows: Generator 1-100 MVA, 35 kV, reactance 10%; Generator 2- 200 MVA, 32 kV, reactance 8%; Generator 3-200 MVA, 35 kV, and reactance 12%. Determine the reactance of the generator corresponding to base Values of 200 MVA, 35 kV.
- A 3-phase, 20 MVA, 11 kV alternator has internal reactance of 5% and negligible resistance. Find the external reactance per phase to be connected in series with the alternator so that steady current on short circuit does not exceed six times the full load current.

**Q.3 Attempt any two of the following questions.**

**12**

- Explain clearly the computational procedure for load flow solution using NR method when the system contains all type of buses.
- The following is the system data for a load flow solution: The line admittances:

| Bus code | Admittance   |
|----------|--------------|
| 1-2      | 2-j8.0       |
| 1-3      | 1-j4.0       |
| 2-3      | 0.666-j2.664 |
| 2-4      | 1-j4.0       |
| 3-4      | 2-j8.0       |



The schedule of active and reactive powers:

| Bus code | P   | Q   | V        | Remarks |
|----------|-----|-----|----------|---------|
| 1        | -   | -   | 1.06     | Slack   |
| 2        | 0.5 | 0.2 | $1+j0.0$ | PQ      |
| 3        | 0.4 | 0.3 | $1+j0.0$ | PQ      |
| 4        | 0.3 | 0.1 | $1+j0.0$ | PQ      |

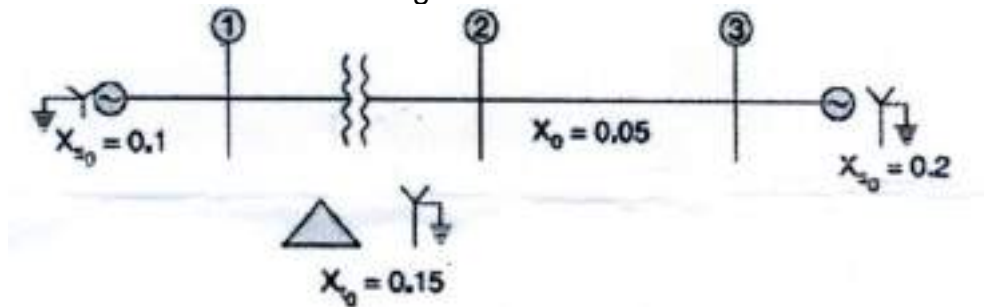
Determine the voltage at the end of first iteration using Gauss-Seidel method. Take  $\alpha = 1.6$ .

- c) Obtain a step by step programmable technique for building a complete Z bus of the given system.

### Section – II

**Q.4 Answer any four of the following question.**

- a) The current from neutral to ground connection is 12 A. Calculate the zero phase sequence components in phases. **16**
- b) The zero sequence reactances (in p.u) are indicated in the network shown in the figure. Determine the value of zero sequence driving – point reactance at node 3 shown in fig.



- c) Determine the fault currents in each phase following a double line-to-ground short circuit at the terminals of a star-connected synchronous generator operating initially on an open circuit voltage of 1 pu. The positive, negative and zero sequence reactance of the generator are, respectively,  $j0.35$ ,  $j0.25$  and  $j0.20$ , and its star point is isolated from ground.
- d) Explain with sequence network various open conductor faults on the power system.
- e) Prove That
- 1)  $\frac{1 - a^2}{a - a^2} = -a$
  - 2)  $\frac{1 - a}{a + a^2} = 1 - a^2$

Where  $a$  and  $a^2$  are vector operators.

- f) Derive swing equation and discuss its importance in power system stability.

**Q.5 Answer any two of the following question.**

- a)** Three 6.6 kV, 12 MVA, 3-phase alternators are connected to a common set of busbars. The positive, negative and zero sequence impedances of each alternator are 15%, 12% and 4.5% respectively. If an earth fault occurs on one busbar, determine the fault current: **12**
- 1) If all the alternator neutrals are solidly grounded
  - 2) If only one of the alternator neutrals is solidly earthed and the others are isolated
  - 3) If one of the alternator neutrals is earthed through a reactance of 0.5 ohm and the others are isolated.
- b)** Derive an expression with sequence network of the system when
- 1) line to line (LL) fault on generator
  - 2) LLG fault on generator
- c)** Three resistors of  $5\Omega$ ,  $10\Omega$  and  $20\Omega$  are connected in delta across the three phases of a balanced 100 volts supply. What are the sequence components in the resistors and in supply lines?

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System – III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries on mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data if necessary and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) At a particular unbalanced node, the real powers specified are: Leaving the node 20 MW, 25 MW Entering the node 60 MW, 30 MW The balancing power will be:
  - a) 30 MW leaving the node
  - b) 45 MW leaving the node
  - c) 45 MW entering the node
  - d) 22.5 MW entering the node and 22.5 MW leaving the node
- 2) For a 15-bus power system with 3 voltage controlled bus, the size of Jacobian matrix is \_\_\_\_\_.
  - a)  $11 \times 11$
  - b)  $12 \times 12$
  - c)  $24 \times 24$
  - d)  $28 \times 28$
- 3) A three-phase, 33 kV oil circuit breaker is rated 1200 A, 2000 MVA, 3 s. The symmetrical breaking current is \_\_\_\_\_.
  - a) 1200 A
  - b) 3600 A
  - c) 35 KA
  - d) 104.8 KA
- 4) The bus-bars of each of the two alternators of 15% reactance each, are interconnected through tie-bar reactors of 15% each. The equivalent impedance to fault current for a 3-phase fault in any alternator bus-bar will be \_\_\_\_\_.
  - a) 75%
  - b) 10%
  - c) 11.25%
  - d) 15%
- 5) Range of accelerating factor is \_\_\_\_\_.
  - a) 50 to 100
  - b) 1 to 10
  - c) 1.6 to 1.8
  - d) 10.8 to 11.2
- 6) For n bus power system size of Y bus matrix is \_\_\_\_\_.
  - a)  $(n-1) \times (n-1)$
  - b)  $(n-2) \times (n-2)$
  - c)  $n \times n$
  - d)  $(n-1) \times (n-2)$

- 7) Which among the following methods are generally used for the calculation of symmetrical faults?
- Norton theorem
  - Thevenin's theorem
  - Kirchhoff's laws
  - Only (b) and (c)
- 8) Which of the following fault results into a three phase faults?
- Single line to ground fault
  - Double line to ground fault
  - Line to line fault
  - Fault due to all the three phases to earth
- 9) In what direction does the phasor get rotated if it is multiplied by the operator 'a'?
- Anti-clockwise
  - Clockwise
  - gets rotated by  $90^\circ$  in the clockwise direction
  - gets rotated by  $90^\circ$  in the anticlockwise direction
- 10) The Critical Clearance time of a fault in the power system is related to \_\_\_\_.
- Reactive power limit
  - Short Circuit limit
  - Steady state stability limit
  - Transient stability limit
- 11) Fault level means \_\_\_\_.
- Fault Current
  - Voltage at the point of fault
  - Fault MVA
  - Fault power factor
- 12) The impedance per phase of 3-phase transmission line on a base of 100 MV A, 100 kV is 2 PV, the value of this impedance on a base of 400 MVA and 400 kV would be \_\_\_\_.
- 1.5 pu
  - 1.0 pu
  - 0.5 pu
  - 0.25 pu
- 13) In a circuit the voltage and current are given by  $v = (10 + j5)$  and  $I = (6 + j4)$ . The circuit is \_\_\_\_.
- inductive
  - Capacitive
  - resistive
  - it could be any of the above
- 14) If a new line is added between the buses 2 and 3 in a system, the elements of Y Bus affected by addition of this line are \_\_\_\_.
- Y22, Y33,
  - Y22, Y23, Y32, Y33
  - Y23, Y32,
  - None of the above

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System – III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any four from following question.**

**16**

- A generating station has five section bus-bar connected with a tie-bar through 7-5% reactors rated at 3000 kVA. Each generator is of 3000 kVA. with 10% reactance and is connected to one section of the bus-bar. Find the total steady input to a dead short-circuit between the lines on one of the sections of the bus-bars with reactors.
- Explain clearly the computational procedure for load flow solution using Decoupled method.
- With the help of sample power system explain step by step method for formation of Y bus using singular Transformation.
- Derive and explain static load flow equation.
- Three generators are rated as follows: Generator 1-100 MVA, 35 kV, reactance 10%; Generator 2- 200 MVA, 32 kV, reactance 8%; Generator 3-200 MVA, 35 kV, and reactance 12%. Determine the reactance of the generator corresponding to base Values of 200 MVA, 35 kV.
- A 3-phase, 20 MVA, 11 kV alternator has internal reactance of 5% and negligible resistance. Find the external reactance per phase to be connected in series with the alternator so that steady current on short circuit does not exceed six times the full load current.

**Q.3 Attempt any two of the following questions.**

**12**

- Explain clearly the computational procedure for load flow solution using NR method when the system contains all type of buses.
- The following is the system data for a load flow solution: The line admittances:

| Bus code | Admittance   |
|----------|--------------|
| 1-2      | 2-j8.0       |
| 1-3      | 1-j4.0       |
| 2-3      | 0.666-j2.664 |
| 2-4      | 1-j4.0       |
| 3-4      | 2-j8.0       |

The schedule of active and reactive powers:

| Bus code | P   | Q   | V      | Remarks |
|----------|-----|-----|--------|---------|
| 1        | -   | -   | 1.06   | Slack   |
| 2        | 0.5 | 0.2 | 1+j0.0 | PQ      |
| 3        | 0.4 | 0.3 | 1+j0.0 | PQ      |
| 4        | 0.3 | 0.1 | 1+j0.0 | PQ      |

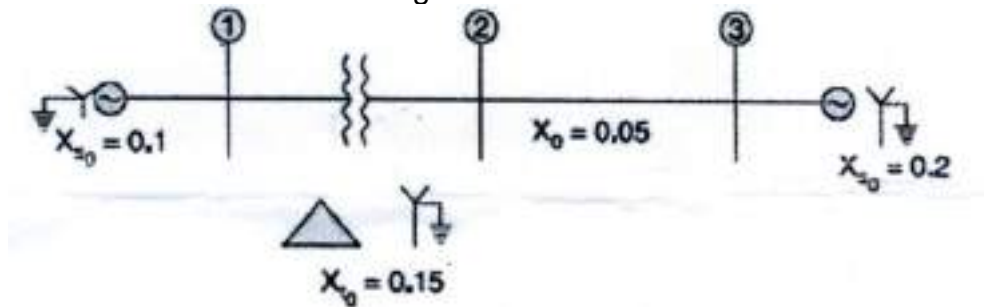
Determine the voltage at the end of first iteration using Gauss-Seidel method. Take  $\alpha = 1.6$ .

- c) Obtain a step by step programmable technique for building a complete Z bus of the given system.

### Section – II

**Q.4 Answer any four of the following question.**

- a) The current from neutral to ground connection is 12 A. Calculate the zero phase sequence components in phases. 16
- b) The zero sequence reactances (in p.u) are indicated in the network shown in the figure. Determine the value of zero sequence driving – point reactance at node 3 shown in fig.



- c) Determine the fault currents in each phase following a double line-to-ground short circuit at the terminals of a star-connected synchronous generator operating initially on an open circuit voltage of 1 pu. The positive, negative and zero sequence reactance of the generator are, respectively,  $j0.35$ ,  $j0.25$  and  $j0.20$ , and its star point is isolated from ground.
- d) Explain with sequence network various open conductor faults on the power system.
- e) Prove That
- 1)  $\frac{1 - a^2}{a - a^2} = -a$
  - 2)  $\frac{1 - a}{a + a^2} = 1 - a^2$

Where  $a$  and  $a^2$  are vector operators.

- f) Derive swing equation and discuss its importance in power system stability.

**Q.5 Answer any two of the following question.**

- a)** Three 6.6 kV, 12 MVA, 3-phase alternators are connected to a common set of busbars. The positive, negative and zero sequence impedances of each alternator are 15%, 12% and 4.5% respectively. If an earth fault occurs on one busbar, determine the fault current: **12**
- 1) If all the alternator neutrals are solidly grounded
  - 2) If only one of the alternator neutrals is solidly earthed and the others are isolated
  - 3) If one of the alternator neutrals is earthed through a reactance of 0.5 ohm and the others are isolated.
- b)** Derive an expression with sequence network of the system when
- 1) line to line (LL) fault on generator
  - 2) LLG fault on generator
- c)** Three resistors of  $5\Omega$ ,  $10\Omega$  and  $20\Omega$  are connected in delta across the three phases of a balanced 100 volts supply. What are the sequence components in the resistors and in supply lines?

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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System – III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries on mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Figures to the right indicate full marks.  
 4) Assume suitable data if necessary and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The Critical Clearance time of a fault in the power system is related to \_\_\_\_\_.  
 a) Reactive power limit                      b) Short Circuit limit  
 c) Steady state stability limit              d) Transient stability limit
- 2) Fault level means \_\_\_\_\_.  
 a) Fault Current                                  b) Voltage at the point of fault  
 c) Fault MVA                                      d) Fault power factor
- 3) The impedance per phase of 3-phase transmission line on a base of 100 MV A, 100 kV is 2 PV, the value of this impedance on a base of 400 MVA and 400 kV would be \_\_\_\_\_.  
 a) 1.5 pu                                              b) 1.0 pu  
 c) 0.5 pu                                              d) 0.25 pu
- 4) In a circuit the voltage and current are given by  $v = (10 + j5)$  and  $I = (6 + j4)$ . The circuit is \_\_\_\_\_.  
 a) inductive                                          b) Capacitive  
 c) resistive                                              d) it could be any of the above
- 5) If a new line is added between the buses 2 and 3 in a system, the elements of Y Bus affected by addition of this line are \_\_\_\_\_.  
 a) Y22, Y33,                                          b) Y22, Y23, Y32, Y33  
 c) Y23, Y32,                                          d) None of the above
- 6) At a particular unbalanced node, the real powers specified are: Leaving the node 20 MW, 25 MW Entering the node 60 MW, 30 MW The balancing power will be:  
 a) 30 MW leaving the node  
 b) 45 MW leaving the node  
 c) 45 MW entering the node  
 d) 22.5 MW entering the node and 22.5 MW leaving the node





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**T. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System – III**

Day & Date: Wednesday, 25-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any four from following question.**

**16**

- A generating station has five section bus-bar connected with a tie-bar through 7-5% reactors rated at 3000 kVA. Each generator is of 3000 kVA. with 10% reactance and is connected to one section of the bus-bar. Find the total steady input to a dead short-circuit between the lines on one of the sections of the bus-bars with reactors.
- Explain clearly the computational procedure for load flow solution using Decoupled method.
- With the help of sample power system explain step by step method for formation of Y bus using singular Transformation.
- Derive and explain static load flow equation.
- Three generators are rated as follows: Generator 1-100 MVA, 35 kV, reactance 10%; Generator 2- 200 MVA, 32 kV, reactance 8%; Generator 3-200 MVA, 35 kV, and reactance 12%. Determine the reactance of the generator corresponding to base Values of 200 MVA, 35 kV.
- A 3-phase, 20 MVA, 11 kV alternator has internal reactance of 5% and negligible resistance. Find the external reactance per phase to be connected in series with the alternator so that steady current on short circuit does not exceed six times the full load current.

**Q.3 Attempt any two of the following questions.**

**12**

- Explain clearly the computational procedure for load flow solution using NR method when the system contains all type of buses.
- The following is the system data for a load flow solution: The line admittances:

| Bus code | Admittance   |
|----------|--------------|
| 1-2      | 2-j8.0       |
| 1-3      | 1-j4.0       |
| 2-3      | 0.666-j2.664 |
| 2-4      | 1-j4.0       |
| 3-4      | 2-j8.0       |

The schedule of active and reactive powers:

| Bus code | P   | Q   | V        | Remarks |
|----------|-----|-----|----------|---------|
| 1        | -   | -   | 1.06     | Slack   |
| 2        | 0.5 | 0.2 | $1+j0.0$ | PQ      |
| 3        | 0.4 | 0.3 | $1+j0.0$ | PQ      |
| 4        | 0.3 | 0.1 | $1+j0.0$ | PQ      |

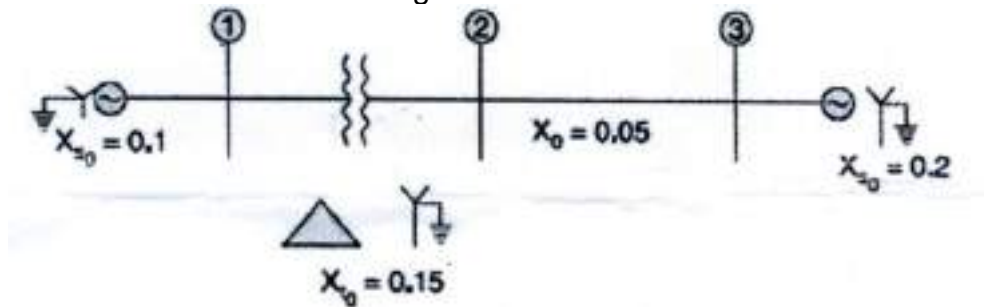
Determine the voltage at the end of first iteration using Gauss-Seidel method. Take  $\alpha = 1.6$ .

- c) Obtain a step by step programmable technique for building a complete Z bus of the given system.

## Section – II

**Q.4 Answer any four of the following question.**

- a) The current from neutral to ground connection is 12 A. Calculate the zero phase sequence components in phases. **16**
- b) The zero sequence reactances (in p.u) are indicated in the network shown in the figure. Determine the value of zero sequence driving – point reactance at node 3 shown in fig.



- c) Determine the fault currents in each phase following a double line-to-ground short circuit at the terminals of a star-connected synchronous generator operating initially on an open circuit voltage of 1 pu. The positive, negative and zero sequence reactance of the generator are, respectively,  $j0.35$ ,  $j0.25$  and  $j0.20$ , and its star point is isolated from ground.
- d) Explain with sequence network various open conductor faults on the power system.
- e) Prove That
- 1)  $\frac{1 - a^2}{a - a^2} = -a$
  - 2)  $\frac{1 - a}{a + a^2} = 1 - a^2$

Where  $a$  and  $a^2$  are vector operators.

- f) Derive swing equation and discuss its importance in power system stability.

**Q.5 Answer any two of the following question.**

- a)** Three 6.6 kV, 12 MVA, 3-phase alternators are connected to a common set of busbars. The positive, negative and zero sequence impedances of each alternator are 15%, 12% and 4.5% respectively. If an earth fault occurs on one busbar, determine the fault current: **12**
- 1) If all the alternator neutrals are solidly grounded
  - 2) If only one of the alternator neutrals is solidly earthed and the others are isolated
  - 3) If one of the alternator neutrals is earthed through a reactance of 0.5 ohm and the others are isolated.
- b)** Derive an expression with sequence network of the system when
- 1) line to line (LL) fault on generator
  - 2) LLG fault on generator
- c)** Three resistors of  $5\Omega$ ,  $10\Omega$  and  $20\Omega$  are connected in delta across the three phases of a balanced 100 volts supply. What are the sequence components in the resistors and in supply lines?

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Day & Date: Tuesday, 31-01-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

1) Which type of node comprises incoming as well as outgoing branches?

- Page 1 of 16

- 9)** Electrical resistance is analogous to
- |            |                   |
|------------|-------------------|
| a) Inertia | b) Dampers        |
| c) Spring  | d) Fluid capacity |
- 10)** Transient response in the system is basically due to
- |                  |             |
|------------------|-------------|
| a) Forces        | b) Friction |
| c) Stored energy | d) Coupling |
- 11)** Physical meaning of zero initial condition is that the
- |                                              |
|----------------------------------------------|
| a) System is at rest and stores no energy    |
| b) System is at rest but stores energy       |
| c) Reference input to working system is zero |
| d) System is working but stores no energy    |
- 12)** Bode plot approach is applied to
- |                          |                              |
|--------------------------|------------------------------|
| a) Minimum phase network | b) Non minimum phase network |
| c) Any network           | d) None of these             |
- 13)** Which among the following represents an illustration of closed loop system?
- |                              |                            |
|------------------------------|----------------------------|
| a) Automatic washing machine | b) Automatic electric iron |
| c) Bread toaster             | d) Electric hand drier     |
- 14)** The initial response when the output is not equal to input is called
- |                       |                        |
|-----------------------|------------------------|
| a) Transient response | b) Error response      |
| c) Dynamic response   | d) Either of the above |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

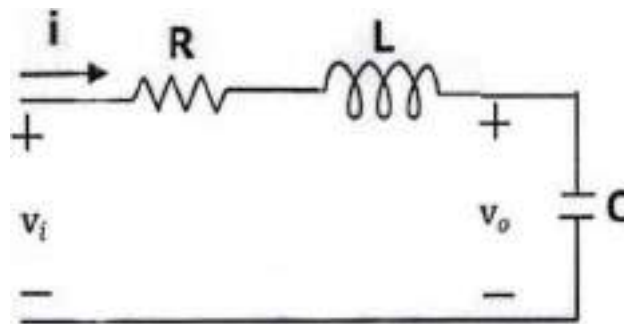
Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

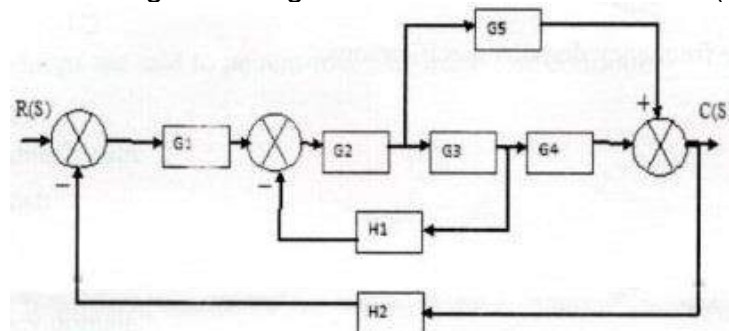
**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Solve any four of the following questions.****16**

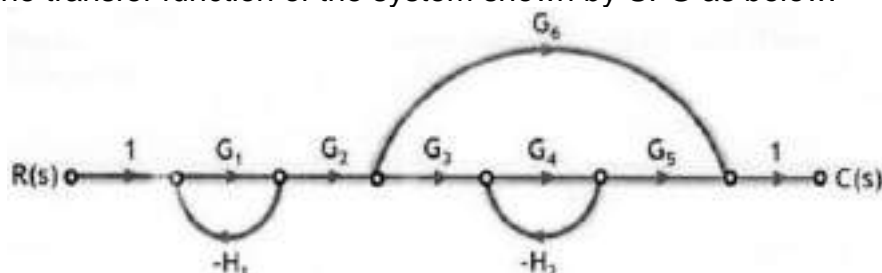
a) Define transfer function. Find the transfer function of below system.



- b) Explain different types of control systems.
- c) Explain terminologies used in signal flow graph.
- d) Explain any four block diagram reduction rules.
- e) Explain F-V analogy.

**Q.3 Solve any two of the following questions.****12**a) Reduce the block diagram using reduction rules and obtain  $C(s)/R(s)$ .

- b) Explain the effect of feedback on system parameter variations of control system.
- c) Find the transfer function of the system shown by SFG as below.



## Section – II

**Q.4 Solve any four of the following questions. 16**

- a) Explain the Angle criteria and magnitude criteria for root locus.
- b) Name the test signals used in control system and explain.
- c) Explain the Time domain specifications.
- d) How stability is related to location of pole? Explain in detail
- e) A second order system is given by  $C(s)/R(s) = \frac{25}{s^2 + 6s + 25}$  Find its rise time, peak time, peak overshoot and settling time.

**Q.5 Solve any two of the following questions. 12**

- a) For a unity feedback system  $G(s) = \frac{K}{s(s+4)(s+2)}$   
Sketch the rough nature of the root locus showing all details on it.
- b) For unity feedback system having  

$$G(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$
Determine
  - i) Type of System
  - ii) Error coefficient
  - iii) steady state error for input as  $1+4t+t^2/2$
- c) Explain the frequency domain specifications.



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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Transfer function of a system is defined as the ratio of output to input in
  - a) Z-transform
  - b) Fourier transform
  - c) Laplace transform
  - d) All of these
- 2) Electrical resistance is analogous to
  - a) Inertia
  - b) Dampers
  - c) Spring
  - d) Fluid capacity
- 3) Transient response in the system is basically due to
  - a) Forces
  - b) Friction
  - c) Stored energy
  - d) Coupling
- 4) Physical meaning of zero initial condition is that the
  - a) System is at rest and stores no energy
  - b) System is at rest but stores energy
  - c) Reference input to working system is zero
  - d) System is working but stores no energy
- 5) Bode plot approach is applied to
  - a) Minimum phase network
  - b) Non minimum phase network
  - c) Any network
  - d) None of these
- 6) Which among the following represents an illustration of closed loop system?
  - a) Automatic washing machine
  - b) Automatic electric iron
  - c) Bread toaster
  - d) Electric hand drier
- 7) The initial response when the output is not equal to input is called
  - a) Transient response
  - b) Error response
  - c) Dynamic response
  - d) Either of the above
- 8) Which type of node comprises incoming as well as outgoing branches?
  - a) Source node
  - b) Sink node
  - c) Chain node
  - d) Main node
- 9) What is the value of step input in Laplace domain?
  - a) 1
  - b) A/s
  - c) A/s<sup>2</sup>
  - d) A/s<sup>3</sup>

- 10) If a system is subjected to step input, which type of static error coefficient performs the function of controlling steady state error?
- a) Position
  - b) Velocity
  - c) Acceleration
  - d) Retardation
- 11) For the transfer function given below, where does the zero of the system lie?
- $$G(s) = 5s - 1 / s^2 + 5s + 4$$
- a)  $s = -1$  &  $s = -1/4$
  - b)  $s = -4$  &  $s = -1$
  - c)  $s = 1/5$
  - d)  $s = -1/5$
- 12) Two loops are said to be non-touching only if no common \_\_\_\_\_ exists between them.
- a) Loop
  - b) Feedback path
  - c) Branch
  - d) Node
- 13) How is the sinusoidal transfer function obtained from the system transfer function in frequency domain?
- a) Replacement of ' $j\omega$ ' by ' $s$ '
  - b) Replacement of ' $s$ ' by ' $\omega$ '
  - c) Replacement of ' $s$ ' by ' $j\omega$ '
  - d) Replacement of ' $\omega$ ' by ' $s$ '
- 14) The frequency at which the phase of the system acquires \_\_\_\_\_ is known as 'Phase crossover frequency'.
- a)  $90^\circ$
  - b)  $-90^\circ$
  - c)  $180^\circ$
  - d)  $-180^\circ$

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

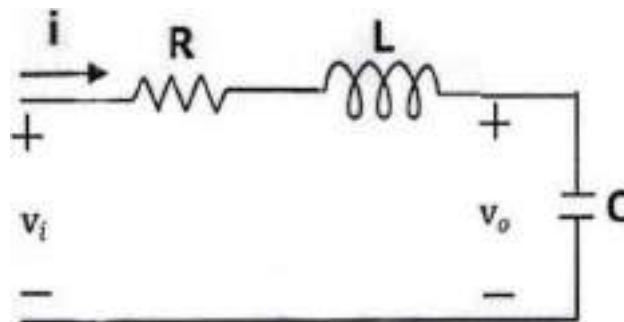
**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions.**

16

a) Define transfer function. Find the transfer function of below system.

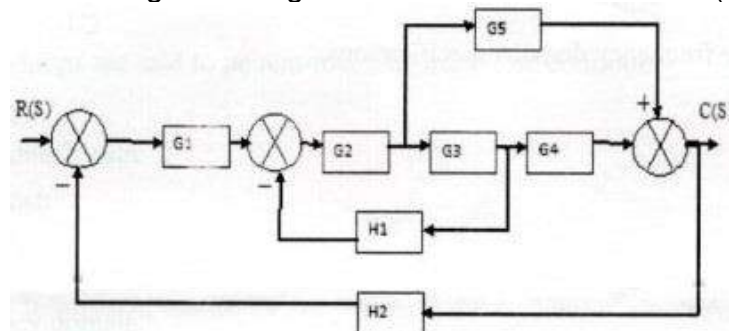


- b) Explain different types of control systems.
- c) Explain terminologies used in signal flow graph.
- d) Explain any four block diagram reduction rules.
- e) Explain F-V analogy.

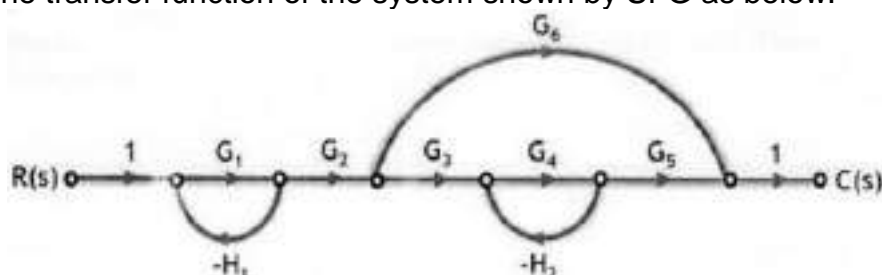
**Q.3 Solve any two of the following questions.**

12

a) Reduce the block diagram using reduction rules and obtain  $C(s)/R(s)$ .



- b) Explain the effect of feedback on system parameter variations of control system.
- c) Find the transfer function of the system shown by SFG as below.



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## Section – II

**Q.4 Solve any four of the following questions.** **16**

- a) Explain the Angle criteria and magnitude criteria for root locus.
- b) Name the test signals used in control system and explain.
- c) Explain the Time domain specifications.
- d) How stability is related to location of pole? Explain in detail
- e) A second order system is given by  $C(s)/R(s) = \frac{25}{s^2 + 6s + 25}$  Find its rise time, peak time, peak overshoot and settling time.

**Q.5 Solve any two of the following questions.** **12**

- a) For a unity feedback system  $G(s) = \frac{K}{s(s+4)(s+2)}$   
Sketch the rough nature of the root locus showing all details on it.

- b) For unity feedback system having

$$G(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$

Determine

- i) Type of System
- ii) Error coefficient
- iii) steady state error for input as  $1+4t+t^2/2$
- c) Explain the frequency domain specifications.

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Physical meaning of zero initial condition is that the
  - a) System is at rest and stores no energy
  - b) System is at rest but stores energy
  - c) Reference input to working system is zero
  - d) System is working but stores no energy
- 2) Bode plot approach is applied to
  - a) Minimum phase network
  - b) Non minimum phase network
  - c) Any network
  - d) None of these
- 3) Which among the following represents an illustration of closed loop system?
  - a) Automatic washing machine
  - b) Automatic electric iron
  - c) Bread toaster
  - d) Electric hand drier
- 4) The initial response when the output is not equal to input is called
  - a) Transient response
  - b) Error response
  - c) Dynamic response
  - d) Either of the above
- 5) Which type of node comprises incoming as well as outgoing branches?
  - a) Source node
  - b) Sink node
  - c) Chain node
  - d) Main node
- 6) What is the value of step input in Laplace domain?
  - a) 1
  - b) A/s
  - c) A/s<sup>2</sup>
  - d) A/s<sup>3</sup>
- 7) If a system is subjected to step input, which type of static error coefficient performs the function of controlling steady state error?
  - a) Position
  - b) Velocity
  - c) Acceleration
  - d) Retardation
- 8) For the transfer function given below, where does the zero of the system lie?
 
$$G(s) = 5s - 1 / s^2 + 5s + 4$$
  - a)  $s = -1$  &  $s = -1/4$
  - b)  $s = -4$  &  $s = -1$
  - c)  $s = 1/5$
  - d)  $s = -1/5$

- 9) Two loops are said to be non-touching only if no common \_\_\_\_\_ exists between them.
- |           |                  |
|-----------|------------------|
| a) Loop   | b) Feedback path |
| c) Branch | d) Node          |
- 10) How is the sinusoidal transfer function obtained from the system transfer function in frequency domain?
- |                                            |                                           |
|--------------------------------------------|-------------------------------------------|
| a) Replacement of ' $j\omega$ ' by ' $s$ ' | b) Replacement of ' $s$ ' by ' $\omega$ ' |
| c) Replacement of ' $s$ ' by ' $j\omega$ ' | d) Replacement of ' $\omega$ ' by ' $s$ ' |
- 11) The frequency at which the phase of the system acquires \_\_\_\_\_ is known as 'Phase crossover frequency'.
- |                |                 |
|----------------|-----------------|
| a) $90^\circ$  | b) $-90^\circ$  |
| c) $180^\circ$ | d) $-180^\circ$ |
- 12) Transfer function of a system is defined as the ratio of output to input in
- |                      |                      |
|----------------------|----------------------|
| a) Z-transform       | b) Fourier transform |
| c) Laplace transform | d) All of these      |
- 13) Electrical resistance is analogous to
- |            |                   |
|------------|-------------------|
| a) Inertia | b) Dampers        |
| c) Spring  | d) Fluid capacity |
- 14) Transient response in the system is basically due to
- |                  |             |
|------------------|-------------|
| a) Forces        | b) Friction |
| c) Stored energy | d) Coupling |

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Set **R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

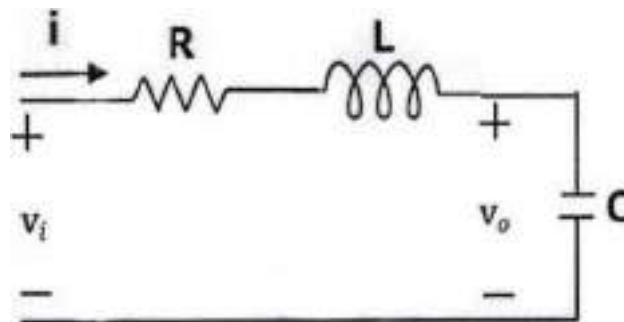
**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions.**

16

a) Define transfer function. Find the transfer function of below system.

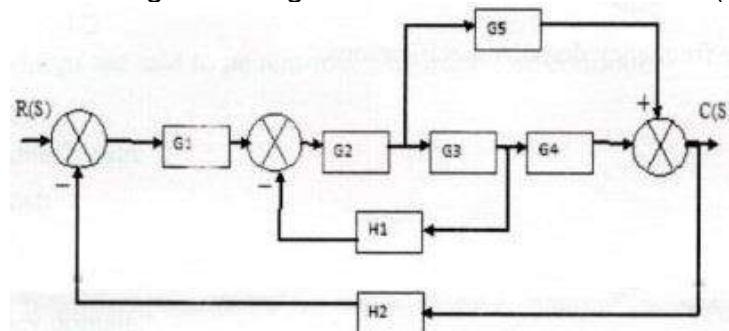


- b) Explain different types of control systems.
- c) Explain terminologies used in signal flow graph.
- d) Explain any four block diagram reduction rules.
- e) Explain F-V analogy.

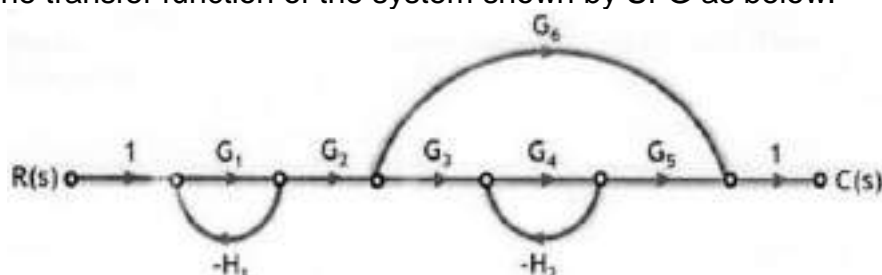
**Q.3 Solve any two of the following questions.**

12

a) Reduce the block diagram using reduction rules and obtain  $C(s)/R(s)$ .



- b) Explain the effect of feedback on system parameter variations of control system.
- c) Find the transfer function of the system shown by SFG as below.



## Section – II

**Q.4 Solve any four of the following questions. 16**

- a) Explain the Angle criteria and magnitude criteria for root locus.
- b) Name the test signals used in control system and explain.
- c) Explain the Time domain specifications.
- d) How stability is related to location of pole? Explain in detail
- e) A second order system is given by  $C(s)/R(s) = \frac{25}{s^2 + 6s + 25}$  Find its rise time, peak time, peak overshoot and settling time.

**Q.5 Solve any two of the following questions. 12**

- a) For a unity feedback system  $G(s) = \frac{K}{s(s+4)(s+2)}$   
Sketch the rough nature of the root locus showing all details on it.

- b) For unity feedback system having

$$G(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$

Determine

- i) Type of System
- ii) Error coefficient
- iii) steady state error for input as  $1+4t+t^2/2$
- c) Explain the frequency domain specifications.



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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) How is the sinusoidal transfer function obtained from the system transfer function in frequency domain?
 

|                                            |                                           |
|--------------------------------------------|-------------------------------------------|
| a) Replacement of ' $j\omega$ ' by ' $s$ ' | b) Replacement of ' $s$ ' by ' $\omega$ ' |
| c) Replacement of ' $s$ ' by ' $j\omega$ ' | d) Replacement of ' $\omega$ ' by ' $s$ ' |
- 2) The frequency at which the phase of the system acquires \_\_\_\_\_ is known as 'Phase crossover frequency'.
 

|                |                 |
|----------------|-----------------|
| a) $90^\circ$  | b) $-90^\circ$  |
| c) $180^\circ$ | d) $-180^\circ$ |
- 3) Transfer function of a system is defined as the ratio of output to input in
 

|                      |                      |
|----------------------|----------------------|
| a) Z-transform       | b) Fourier transform |
| c) Laplace transform | d) All of these      |
- 4) Electrical resistance is analogous to
 

|            |                   |
|------------|-------------------|
| a) Inertia | b) Dampers        |
| c) Spring  | d) Fluid capacity |
- 5) Transient response in the system is basically due to
 

|                  |             |
|------------------|-------------|
| a) Forces        | b) Friction |
| c) Stored energy | d) Coupling |
- 6) Physical meaning of zero initial condition is that the
 

|                                              |
|----------------------------------------------|
| a) System is at rest and stores no energy    |
| b) System is at rest but stores energy       |
| c) Reference input to working system is zero |
| d) System is working but stores no energy    |
- 7) Bode plot approach is applied to
 

|                          |                              |
|--------------------------|------------------------------|
| a) Minimum phase network | b) Non minimum phase network |
| c) Any network           | d) None of these             |
- 8) Which among the following represents an illustration of closed loop system?
 

|                              |                            |
|------------------------------|----------------------------|
| a) Automatic washing machine | b) Automatic electric iron |
| c) Bread toaster             | d) Electric hand drier     |

- 9) The initial response when the output is not equal to input is called  
a) Transient response                      b) Error response  
c) Dynamic response                      d) Either of the above
- 10) Which type of node comprises incoming as well as outgoing branches?  
a) Source node                              b) Sink node  
c) Chain node                              d) Main node
- 11) What is the value of step input in Laplace domain?  
a) 1                                              b)  $A/s$   
c)  $A/s^2$                                       d)  $A/s^3$
- 12) If a system is subjected to step input, which type of static error coefficient performs the function of controlling steady state error?  
a) Position                                      b) Velocity  
c) Acceleration                              d) Retardation
- 13) For the transfer function given below, where does the zero of the system lie?  
$$G(s) = 5s - 1 / s^2 + 5s + 4$$
  
a)  $s = -1$  &  $s = -1/4$                       b)  $s = -4$  &  $s = -1$   
c)  $s = 1/5$                                       d)  $s = -1/5$
- 14) Two loops are said to be non-touching only if no common \_\_\_\_\_ exists between them.  
a) Loop                                              b) Feedback path  
c) Branch                                              d) Node

Seat  
No.

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Linear Control System**

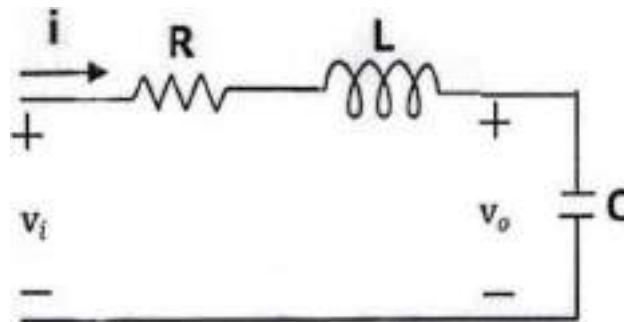
Day & Date: Tuesday, 31-01-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

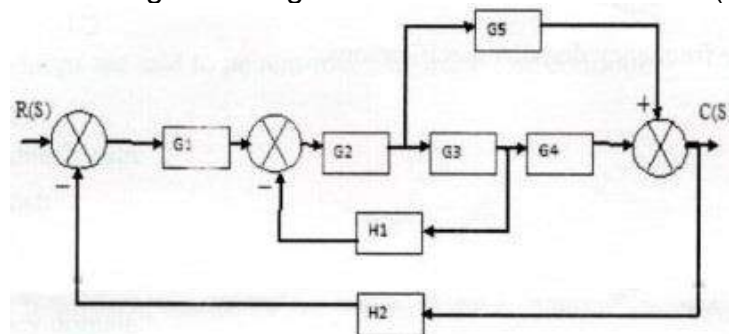
**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Solve any four of the following questions.****16**

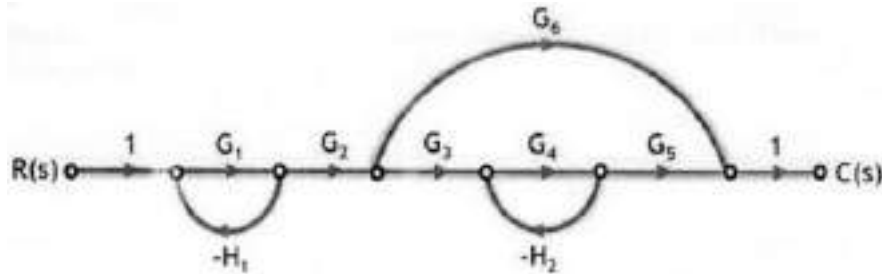
a) Define transfer function. Find the transfer function of below system.



- b) Explain different types of control systems.
- c) Explain terminologies used in signal flow graph.
- d) Explain any four block diagram reduction rules.
- e) Explain F-V analogy.

**Q.3 Solve any two of the following questions.****12**a) Reduce the block diagram using reduction rules and obtain  $C(s)/R(s)$ .

- b) Explain the effect of feedback on system parameter variations of control system.
- c) Find the transfer function of the system shown by SFG as below.



**SLR-HL-354**

**Set S**

### Section – II

**Q.4 Solve any four of the following questions.**

**16**

- Explain the Angle criteria and magnitude criteria for root locus.
- Name the test signals used in control system and explain.
- Explain the Time domain specifications.
- How stability is related to location of pole? Explain in detail
- A second order system is given by  $C(s)/R(s) = \frac{25}{s^2 + 6s + 25}$  Find its rise time, peak time, peak overshoot and settling time.

**Q.5 Solve any two of the following questions.**

**12**

- For a unity feedback system  $G(s) = \frac{K}{s(s+4)(s+2)}$   
Sketch the rough nature of the root locus showing all details on it.
- For unity feedback system having  
$$G(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$
  
Determine
  - Type of System
  - Error coefficient
  - steady state error for input as  $1+4t+t^2/2$
- Explain the frequency domain specifications.

|          |  |
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| Seat No. |  |
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P

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Microprocessor and Microcontroller**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of the following circuit is used as a special signal to demultiplex the address bus and data bus?
 

|                         |                  |
|-------------------------|------------------|
| a) Priority Encoder     | b) Decoder       |
| c) Address Latch Enable | d) Demultiplexer |
- 2) Which of the following is a non-vectored input?
 

|            |            |
|------------|------------|
| a) TRAP    | b) RST-7.5 |
| c) RST-6.5 | d) INTR    |
- 3) Conditional instructions are independent of which of the following flag?
 

|       |       |
|-------|-------|
| a) Z  | b) AC |
| c) CY | d) P  |
- 4) How many bytes of bit addressable memory is present in 8051 based microcontrollers?
 

|             |              |
|-------------|--------------|
| a) 8 bytes  | b) 32 bytes  |
| c) 16 bytes | d) 128 bytes |
- 5) LCALL instruction takes
 

|            |            |
|------------|------------|
| a) 2 bytes | b) 4 bytes |
| c) 3 bytes | d) 1 byte  |
- 6) Which out of the four ports of 8051 needs a pull-up resistor for using it is as an input or an output port?
 

|           |            |
|-----------|------------|
| a) PORT 0 | b) PORTS 1 |
| c) PORT 2 | d) PORT 3  |
- 7) MOVC A, @ A + PC is a example of \_\_\_\_\_ addressing mode.
 

|              |                  |
|--------------|------------------|
| a) Immediate | b) Direct        |
| c) Indexed   | d) None of these |
- 8) \_\_\_\_\_ SFR is not bit addressable.
 

|         |           |
|---------|-----------|
| a) TCON | b) PSW    |
| c) SBUF | d) Port 0 |
- 9) When 8051 wakes up then 0x00 is loaded to which register?
 

|        |                          |
|--------|--------------------------|
| a) PSW | b) SP                    |
| c) PC  | d) None of the mentioned |

- 10) Which instructions have no effect on the flags of PSW?
  - a) ANL
  - b) ORL
  - c) XRL
  - d) All of the mentioned
- 11) Which register is used to make the interrupt level or an edge triggered pulse?
  - a) TCON
  - b) IE
  - c) IP
  - d) SCON
- 12) For writing commands on an LCD, RS bit is
  - a) set
  - b) reset
  - c) set & reset
  - d) none of the mentioned
- 13) In ADC0808/0809 IC which pin is used to select Step Size?
  - a) Vref
  - b) Vin
  - c) Vref/2 & Vin
  - d) None of the mentioned
- 14) Number of steps to rotate stepper motor for 360 degree at a step angle of 1.8 degree is \_\_\_\_\_.
  - a) 200
  - b) 100
  - c) 300
  - d) 150

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|------------|----------|
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Microprocessor and Microcontroller**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- a) Explain features of 8051 microcontroller.
- b) Draw and explain demultiplexing of address and data Bus in 8085 microprocessor.
- c) Explain any four Arithmetic instruction of 8051 microcontroller.
- d) Explain following pins of 8051 microcontroller.
  - 1) EA
  - 2) PSEN
  - 3) ALE
  - 4) RESET
- e) Write an ALP to perform multiplication of two 8-bit numbers stored at 20H and 21H memory location. Store result at 50H and 51H memory location.

**Q.3 Solve any two of the following questions. 12**

- a) Explain the working of
  - 1) Stack and Stack Pointer
  - 2) Program Counter and Data Pointer
- b) Draw and explain internal memory Structure of RAM in 8051 microcontroller.
- c) Draw the interfacing diagram of 8KB data ROM with 8051 microcontroller also mention starting and ending addresses of interfaces memory.

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- a) Explain the alternate functions of Port-3 of 8051 microcontroller.
- b) Draw and explain TCON special function register of 8051 microcontroller.
- c) Compare between RAM and ROM (any four point).
- d) Explain following pins of LCD
  - 1) RS
  - 2) R/W
  - 3) Enable
  - 4) VEE
- e) Draw and explain interfacing diagram of 8051 microcontroller with ADC 0809.

**Q.5 Solve any two of the following questions.**

- a)** Write a program to generate square wave of 1KHZ frequency on pin P1.4 using timer 0 in mode 1. Assuming XTAL=11.0592MHZ.
- b)** Draw and explain interfacing diagram of 8051 microcontroller with 4x4 matrix Key Board.
- c)** Draw the interfacing of stepper motor with 8051 microcontroller. Write an ALP to rotate the stepper motor in anticlockwise direction, 90 degree apart with a step angle of 1.8 degree.



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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Microprocessor and Microcontroller**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) \_\_\_\_\_ SFR is not bit addressable.
 

|         |           |
|---------|-----------|
| a) TCON | b) PSW    |
| c) SBUF | d) Port 0 |
- 2) When 8051 wakes up then 0x00 is loaded to which register?
 

|        |                          |
|--------|--------------------------|
| a) PSW | b) SP                    |
| c) PC  | d) None of the mentioned |
- 3) Which instructions have no effect on the flags of PSW?
 

|        |                         |
|--------|-------------------------|
| a) ANL | b) ORL                  |
| c) XRL | d) All of the mentioned |
- 4) Which register is used to make the interrupt level or an edge triggered pulse?
 

|         |         |
|---------|---------|
| a) TCON | b) IE   |
| c) IP   | d) SCON |
- 5) For writing commands on an LCD, RS bit is
 

|                |                          |
|----------------|--------------------------|
| a) set         | b) reset                 |
| c) set & reset | d) none of the mentioned |
- 6) In ADC0808/0809 IC which pin is used to select Step Size?
 

|                 |                          |
|-----------------|--------------------------|
| a) Vref         | b) Vin                   |
| c) Vref/2 & Vin | d) None of the mentioned |
- 7) Number of steps to rotate stepper motor for 360 degree at a step angle of 1.8 degree is \_\_\_\_\_.
 

|        |        |
|--------|--------|
| a) 200 | b) 100 |
| c) 300 | d) 150 |
- 8) Which of the following circuit is used as a special signal to demultiplex the address bus and data bus?
 

|                         |                  |
|-------------------------|------------------|
| a) Priority Encoder     | b) Decoder       |
| c) Address Latch Enable | d) Demultiplexer |
- 9) Which of the following is a non-vectored input?
 

|            |            |
|------------|------------|
| a) TRAP    | b) RST-7.5 |
| c) RST-6.5 | d) INTR    |

- 10) Conditional instructions are independent of which of the following flag?

|       |       |
|-------|-------|
| a) Z  | b) AC |
| c) CY | d) P  |
- 11) How many bytes of bit addressable memory is present in 8051 based microcontrollers?

|             |              |
|-------------|--------------|
| a) 8 bytes  | b) 32 bytes  |
| c) 16 bytes | d) 128 bytes |
- 12) LCALL instruction takes

|            |            |
|------------|------------|
| a) 2 bytes | b) 4 bytes |
| c) 3 bytes | d) 1 byte  |
- 13) Which out of the four ports of 8051 needs a pull-up resistor for using it as an input or an output port?

|           |            |
|-----------|------------|
| a) PORT 0 | b) PORTS 1 |
| c) PORT 2 | d) PORT 3  |
- 17) MOV C A,@ A + PC is a example of \_\_\_\_\_ addressing mode.

|              |                  |
|--------------|------------------|
| a) Immediate | b) Direct        |
| c) Indexed   | d) None of these |

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| <b>Seat No.</b> |  |
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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Microprocessor and Microcontroller**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- a) Explain features of 8051 microcontroller.
- b) Draw and explain demultiplexing of address and data Bus in 8085 microprocessor.
- c) Explain any four Arithmetic instruction of 8051 microcontroller.
- d) Explain following pins of 8051 microcontroller.
  - 1) EA
  - 2) PSEN
  - 3) ALE
  - 4) RESET
- e) Write an ALP to perform multiplication of two 8-bit numbers stored at 20H and 21H memory location. Store result at 50H and 51H memory location.

**Q.3 Solve any two of the following questions. 12**

- a) Explain the working of
  - 1) Stack and Stack Pointer
  - 2) Program Counter and Data Pointer
- b) Draw and explain internal memory Structure of RAM in 8051 microcontroller.
- c) Draw the interfacing diagram of 8KB data ROM with 8051 microcontroller also mention starting and ending addresses of interfaces memory.

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- a) Explain the alternate functions of Port-3 of 8051 microcontroller.
- b) Draw and explain TCON special function register of 8051 microcontroller.
- c) Compare between RAM and ROM (any four point).
- d) Explain following pins of LCD
  - 1) RS
  - 2) R/W
  - 3) Enable
  - 4) VEE
- e) Draw and explain interfacing diagram of 8051 microcontroller with ADC 0809.

**Q.5 Solve any two of the following questions.**

- a)** Write a program to generate square wave of 1KHZ frequency on pin P1.4 using timer 0 in mode 1. Assuming XTAL=11.0592MHZ.
- b)** Draw and explain interfacing diagram of 8051 microcontroller with 4x4 matrix Key Board.
- c)** Draw the interfacing of stepper motor with 8051 microcontroller. Write an ALP to rotate the stepper motor in anticlockwise direction, 90 degree apart with a step angle of 1.8 degree.

\_\_\_\_\_

## Max. Marks: 70

Marks: 14

Page 9 of 16

- 10) Which out of the four ports of 8051 needs a pull-up resistor for using it is as an input or an output port?
- |           |            |
|-----------|------------|
| a) PORT 0 | b) PORTS 1 |
| c) PORT 2 | d) PORT 3  |
- 11) `MOVC A,@ A + PC` is a example of \_\_\_\_\_ addressing mode.
- |              |                  |
|--------------|------------------|
| a) Immediate | b) Direct        |
| c) Indexed   | d) None of these |
- 12) \_\_\_\_\_ SFR is not bit addressable.
- |         |           |
|---------|-----------|
| a) TCON | b) PSW    |
| c) SBUF | d) Port 0 |
- 13) When 8051 wakes up then 0x00 is loaded to which register?
- |        |                          |
|--------|--------------------------|
| a) PSW | b) SP                    |
| c) PC  | d) None of the mentioned |
- 14) Which instructions have no effect on the flags of PSW?
- |        |                         |
|--------|-------------------------|
| a) ANL | b) ORL                  |
| c) XRL | d) All of the mentioned |

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**Set R**

**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Microprocessor and Microcontroller**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- a) Explain features of 8051 microcontroller.
- b) Draw and explain demultiplexing of address and data Bus in 8085 microprocessor.
- c) Explain any four Arithmetic instruction of 8051 microcontroller.
- d) Explain following pins of 8051 microcontroller.
  - 1) EA
  - 2) PSEN
  - 3) ALE
  - 4) RESET
- e) Write an ALP to perform multiplication of two 8-bit numbers stored at 20H and 21H memory location. Store result at 50H and 51H memory location.

**Q.3 Solve any two of the following questions. 12**

- a) Explain the working of
  - 1) Stack and Stack Pointer
  - 2) Program Counter and Data Pointer
- b) Draw and explain internal memory Structure of RAM in 8051 microcontroller.
- c) Draw the interfacing diagram of 8KB data ROM with 8051 microcontroller also mention starting and ending addresses of interfaces memory.

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- a) Explain the alternate functions of Port-3 of 8051 microcontroller.
- b) Draw and explain TCON special function register of 8051 microcontroller.
- c) Compare between RAM and ROM (any four point).
- d) Explain following pins of LCD
  - 1) RS
  - 2) R/W
  - 3) Enable
  - 4) VEE
- e) Draw and explain interfacing diagram of 8051 microcontroller with ADC 0809.

**Q.5 Solve any two of the following questions.**

- a)** Write a program to generate square wave of 1KHZ frequency on pin P1.4 using timer 0 in mode 1. Assuming XTAL=11.0592MHZ.
- b)** Draw and explain interfacing diagram of 8051 microcontroller with 4x4 matrix Key Board.
- c)** Draw the interfacing of stepper motor with 8051 microcontroller. Write an ALP to rotate the stepper motor in anticlockwise direction, 90 degree apart with a step angle of 1.8 degree.



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## Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- Page 13 of 16

- 10) Which of the following circuit is used as a special signal to demultiplex the address bus and data bus?
- a) Priority Encoder
  - b) Decoder
  - c) Address Latch Enable
  - d) Demultiplexer
- 11) Which of the following is a non-vectored input?
- a) TRAP
  - b) RST-7.5
  - c) RST-6.5
  - d) INTR
- 12) Conditional instructions are independent of which of the following flag?
- a) Z
  - b) AC
  - c) CY
  - d) P
- 13) How many bytes of bit addressable memory is present in 8051 based microcontrollers?
- a) 8 bytes
  - b) 32 bytes
  - c) 16 bytes
  - d) 128 bytes
- 14) LCALL instruction takes
- a) 2 bytes
  - b) 4 bytes
  - c) 3 bytes
  - d) 1 byte

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**T.Y. (B.Tech) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Microprocessor and Microcontroller**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- a) Explain features of 8051 microcontroller.
- b) Draw and explain demultiplexing of address and data Bus in 8085 microprocessor.
- c) Explain any four Arithmetic instruction of 8051 microcontroller.
- d) Explain following pins of 8051 microcontroller.
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  - 2) PSEN
  - 3) ALE
  - 4) RESET
- e) Write an ALP to perform multiplication of two 8-bit numbers stored at 20H and 21H memory location. Store result at 50H and 51H memory location.

**Q.3 Solve any two of the following questions. 12**

- a) Explain the working of
  - 1) Stack and Stack Pointer
  - 2) Program Counter and Data Pointer
- b) Draw and explain internal memory Structure of RAM in 8051 microcontroller.
- c) Draw the interfacing diagram of 8KB data ROM with 8051 microcontroller also mention starting and ending addresses of interfaces memory.

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- a) Explain the alternate functions of Port-3 of 8051 microcontroller.
- b) Draw and explain TCON special function register of 8051 microcontroller.
- c) Compare between RAM and ROM (any four point).
- d) Explain following pins of LCD
  - 1) RS
  - 2) R/W
  - 3) Enable
  - 4) VEE
- e) Draw and explain interfacing diagram of 8051 microcontroller with ADC 0809.

**Q.5 Solve any two of the following questions.**

- a)** Write a program to generate square wave of 1KHZ frequency on pin P1.4 using timer 0 in mode 1. Assuming XTAL=11.0592MHZ.
- b)** Draw and explain interfacing diagram of 8051 microcontroller with 4x4 matrix Key Board.
- c)** Draw the interfacing of stepper motor with 8051 microcontroller. Write an ALP to rotate the stepper motor in anticlockwise direction, 90 degree apart with a step angle of 1.8 degree.

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**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the given option:** **14**

- 1) The quantity which has the only magnitude is called\_\_\_\_\_.  
 a) A scalar quantity  
 b) A vector quantity  
 c) A chemical quantity  
 d) A magnitude quantity
- 2) A polar vector is one which?  
 a) Gives the position of an object  
 b) Tells how much and in which direction an object has changed its position  
 c) Represents rotational effect  
 d) Has a starting point of application
- 3) What is the magnitude of a unit vector?  
 a) It has no magnitude  
 b) Zero  
 c) Constant but not zero  
 d) Unity
- 4) Which of the following has zero magnitude?  
 a) Fixed vector  
 b) Zero vector  
 c) Modulus of a vector  
 d) Unit vector
- 5) For motion in two or three dimensions, what is the angle between velocity and acceleration vectors?  
 a) 0°  
 b) 180°  
 c) Between 0° and 180°  
 d) 90°
- 6) An object thrown from an aeroplane is an example for\_\_\_\_\_.  
 a) Projectile motion  
 b) Resolution of forces  
 c) Composition of vectors c Addition  
 d) Addition of vectors

- 7) In Gauss law formula, Q stands for?  
a) the electric constant  
b) total charge within the given surface  
c) magnetic field  
d) None of the above
- 8) The Cartesian system is also called as  
a) Circular coordinate system  
b) Rectangular coordinate system  
c) Spherical coordinate system  
d) Space coordinate system
- 9) Unit vector is having \_\_\_\_\_.  
a) Direction with one magnitude  
b) Magnitude is one but not direction  
c) Not both magnitude and direction  
d) None of above
- 10) The volume of a parallelepiped in Cartesian is  
a)  $dV = dx \, dy \, dz$   
b)  $dV = dx \, dy$   
c)  $dV = dy \, dz$   
d)  $dV = dx \, dz$
- 11) Which of the following criteria is used to choose a coordinate system?  
a) Distance  
b) Intensity  
c) Magnitude  
d) Geometry
- 12) Vector transformation followed by coordinate point substitution and vice-versa, both given the same result. Choose the best answer.  
a) Possible, when the vector is constant  
b) Possible, when the vector is variable  
c) Possible in all cases  
d) Not possible
- 13) The cylindrical coordinate system is also referred to as  
a) Cartesian system  
b) Circular system  
c) Spherical system  
d) Space system
- 14) The pressure inside a piston cylinder is a variable of  
a) Radius  
b) Plane angle  
c) Z plane distance  
d) Constant, not a variable

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Set **P**

**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four:** **16**

- 1) Points P and Q are located at (1,-2,4) and (-5,4,2). Determine the position of vector P
- 2) Find the scalar component of  $6a_x + 2a_y - 3a_z$  along  $3a_x - 4a_y$ .
- 3) Explain Relationship between Cartesian and Cylindrical Co-ordinates.
- 4) Explain Conditions of Gauss's Law.
- 5) Explain Dielectrics in an Electric Field.

**Q.3 Solve any Two:** **12**

- 1) Explain Electric Field Intensity due to Dipole.
- 2) Explain Poisson's and Laplace's Equations.
- 3) Explain Electric Field Intensity.

**Section – II**

**Q.4 Solve any Four:** **16**

- 1) Explain Biot-Savart's Law.
- 2) Explain Magnetic Flux Density.
- 3) Explain Magnetic Dipole.
- 4) Find H at center of an Equilateral triangular loop of side 4m carrying current of 5A.
- 5) Write a short note on Inductors and Inductances.

**Q.5 Solve any Two:** **12**

- 1) Derive Energy density in the magnetic field.
- 2) Derive Displacement current.
- 3) A single turn rectangular loop of enclosed area 1 sq. m is situated in air with its plane normal to a magnetic field which varies at the rate of  $\text{wb/m}^2 \text{ sec}$ . Estimate emf induced in the loop.

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**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the given option:**

**14**

- 1) The Cartesian system is also called as
  - a) Circular coordinate system
  - b) Rectangular coordinate system
  - c) Spherical coordinate system
  - d) Space coordinate system
- 2) Unit vector is having \_\_\_\_\_.
  - a) Direction with one magnitude
  - b) Magnitude is one but not direction
  - c) Not both magnitude and direction
  - d) None of above
- 3) The volume of a parallelepiped in Cartesian is
  - a)  $dV = dx \, dy \, dz$
  - b)  $dV = dx \, dy$
  - c)  $dV = dy \, dz$
  - d)  $dV = dx \, dz$
- 4) Which of the following criteria is used to choose a coordinate system?
  - a) Distance
  - b) Intensity
  - c) Magnitude
  - d) Geometry
- 5) Vector transformation followed by coordinate point substitution and vice-versa, both given the same result. Choose the best answer.
  - a) Possible, when the vector is constant
  - b) Possible, when the vector is variable
  - c) Possible in all cases
  - d) Not possible



- 6) The cylindrical coordinate system is also referred to as
- Cartesian system
  - Circular system
  - Spherical system
  - Space system
- 7) The pressure inside a piston cylinder is a variable of
- Radius
  - Plane angle
  - Z plane distance
  - Constant, not a variable
- 8) The quantity which has the only magnitude is called\_\_\_\_\_.
- A scalar quantity
  - A vector quantity
  - A chemical quantity
  - A magnitude quantity
- 9) A polar vector is one which?
- Gives the position of an object
  - Tells how much and in which direction an object has changed its position
  - Represents rotational effect
  - Has a starting point of application
- 10) What is the magnitude of a unit vector?
- It has no magnitude
  - Zero
  - Constant but not zero
  - Unity
- 11) Which of the following has zero magnitude?
- |                        |                |
|------------------------|----------------|
| a) Fixed vector        | b) Zero vector |
| c) Modulus of a vector | d) Unit vector |
- 12) For motion in two or three dimensions, what is the angle between velocity and acceleration vectors?
- 0°
  - 180°
  - Between 0° and 180°
  - 90°
- 13) An object thrown from an aeroplane is an example for\_\_\_\_\_.
- Projectile motion
  - Resolution of forces
  - Composition of vectors c Addition
  - Addition of vectors
- 14) In Gauss law formula, Q stands for?
- the electric constant
  - total charge within the given surface
  - magnetic field
  - None of the above

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T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022

**ELECTRICAL ENGINEERING****Electromagnetic Engineering**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I****Q.2 Solve any four:** 16

- 1) Points P and Q are located at (1,-2,4) and (-5,4,2). Determine the position of vector P
- 2) Find the scalar component of  $6a_x + 2a_y - 3a_z$  along  $3a_x - 4a_y$ .
- 3) Explain Relationship between Cartesian and Cylindrical Co-ordinates.
- 4) Explain Conditions of Gauss's Law.
- 5) Explain Dielectrics in an Electric Field.

**Q.3 Solve any Two:** 12

- 1) Explain Electric Field Intensity due to Dipole.
- 2) Explain Poisson's and Laplace's Equations.
- 3) Explain Electric Field Intensity.

**Section – II****Q.4 Solve any Four:** 16

- 1) Explain Biot-Savart's Law.
- 2) Explain Magnetic Flux Density.
- 3) Explain Magnetic Dipole.
- 4) Find H at center of an Equilateral triangular loop of side 4m carrying current of 5A.
- 5) Write a short note on Inductors and Inductances.

**Q.5 Solve any Two:** 12

- 1) Derive Energy density in the magnetic field.
- 2) Derive Displacement current.
- 3) A single turn rectangular loop of enclosed area 1 sq. m is situated in air with its plane normal to a magnetic field which varies at the rate of  $\text{wb/m}^2 \text{ sec}$ . Estimate emf induced in the loop.

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**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the given option:** **14**

- 1) Which of the following criteria is used to choose a coordinate system?
  - a) Distance
  - b) Intensity
  - c) Magnitude
  - d) Geometry
- 2) Vector transformation followed by coordinate point substitution and vice-versa, both given the same result. Choose the best answer.
  - a) Possible, when the vector is constant
  - b) Possible, when the vector is variable
  - c) Possible in all cases
  - d) Not possible
- 3) The cylindrical coordinate system is also referred to as
  - a) Cartesian system
  - b) Circular system
  - c) Spherical system
  - d) Space system
- 4) The pressure inside a piston cylinder is a variable of
  - a) Radius
  - b) Plane angle
  - c) Z plane distance
  - d) Constant, not a variable
- 5) The quantity which has the only magnitude is called \_\_\_\_\_.
  - a) A scalar quantity
  - b) A vector quantity
  - c) A chemical quantity
  - d) A magnitude quantity
- 6) A polar vector is one which?
  - a) Gives the position of an object
  - b) Tells how much and in which direction an object has changed its position
  - c) Represents rotational effect
  - d) Has a starting point of application

- 7) What is the magnitude of a unit vector?
- a) It has no magnitude
  - b) Zero
  - c) Constant but not zero
  - d) Unity
- 8) Which of the following has zero magnitude?
- a) Fixed vector
  - b) Zero vector
  - c) Modulus of a vector
  - d) Unit vector
- 9) For motion in two or three dimensions, what is the angle between velocity and acceleration vectors?
- a)  $0^\circ$
  - b)  $180^\circ$
  - c) Between  $0^\circ$  and  $180^\circ$
  - d)  $90^\circ$
- 10) An object thrown from an aeroplane is an example for \_\_\_\_.
- a) Projectile motion
  - b) Resolution of forces
  - c) Composition of vectors c Addition
  - d) Addition of vectors
- 11) In Gauss law formula, Q stands for?
- a) the electric constant
  - b) total charge within the given surface
  - c) magnetic field
  - d) None of the above
- 12) The Cartesian system is also called as
- a) Circular coordinate system
  - b) Rectangular coordinate system
  - c) Spherical coordinate system
  - d) Space coordinate system
- 13) Unit vector is having \_\_\_\_.
- a) Direction with one magnitude
  - b) Magnitude is one but not direction
  - c) Not both magnitude and direction
  - d) None of above
- 14) The volume of a parallelepiped in Cartesian is
- a)  $dV = dx dy dz$
  - b)  $dV = dx dy$
  - c)  $dV = dy dz$
  - d)  $dV = dx dz$

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**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four:** **16**

- 1) Points P and Q are located at (1,-2,4) and (-5,4,2). Determine the position of vector P
- 2) Find the scalar component of  $6a_x + 2a_y - 3a_z$  along  $3a_x - 4a_y$ .
- 3) Explain Relationship between Cartesian and Cylindrical Co-ordinates.
- 4) Explain Conditions of Gauss's Law.
- 5) Explain Dielectrics in an Electric Field.

**Q.3 Solve any Two:** **12**

- 1) Explain Electric Field Intensity due to Dipole.
- 2) Explain Poisson's and Laplace's Equations.
- 3) Explain Electric Field Intensity.

**Section – II**

**Q.4 Solve any Four:** **16**

- 1) Explain Biot-Savart's Law.
- 2) Explain Magnetic Flux Density.
- 3) Explain Magnetic Dipole.
- 4) Find H at center of an Equilateral triangular loop of side 4m carrying current of 5A.
- 5) Write a short note on Inductors and Inductances.

**Q.5 Solve any Two:** **12**

- 1) Derive Energy density in the magnetic field.
- 2) Derive Displacement current.
- 3) A single turn rectangular loop of enclosed area 1 sq. m is situated in air with its plane normal to a magnetic field which varies at the rate of  $\text{wb/m}^2 \text{ sec}$ . Estimate emf induced in the loop.

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**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the given option:**

**14**

- 1) An object thrown from an aeroplane is an example for \_\_\_\_\_.
  - a) Projectile motion
  - b) Resolution of forces
  - c) Composition of vectors c Addition
  - d) Addition of vectors
- 2) In Gauss law formula, Q stands for?
  - a) the electric constant
  - b) total charge within the given surface
  - c) magnetic field
  - d) None of the above
- 3) The Cartesian system is also called as
  - a) Circular coordinate system
  - b) Rectangular coordinate system
  - c) Spherical coordinate system
  - d) Space coordinate system
- 4) Unit vector is having \_\_\_\_\_.
  - a) Direction with one magnitude
  - b) Magnitude is one but not direction
  - c) Not both magnitude and direction
  - d) None of above
- 5) The volume of a parallelepiped in Cartesian is
  - a)  $dV = dx dy dz$
  - b)  $dV = dx dy$
  - c)  $dV = dy dz$
  - d)  $dV = dx dz$
- 6) Which of the following criteria is used to choose a coordinate system?
  - a) Distance
  - b) Intensity
  - c) Magnitude
  - d) Geometry

- 7) Vector transformation followed by coordinate point substitution and vice-versa, both given the same result. Choose the best answer.
- a) Possible, when the vector is constant
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  - c) Possible in all cases
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- 8) The cylindrical coordinate system is also referred to as
- a) Cartesian system
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  - c) Spherical system
  - d) Space system
- 9) The pressure inside a piston cylinder is a variable of
- a) Radius
  - b) Plane angle
  - c) Z plane distance
  - d) Constant, not a variable
- 10) The quantity which has the only magnitude is called\_\_\_\_\_.
- a) A scalar quantity
  - b) A vector quantity
  - c) A chemical quantity
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- 11) A polar vector is one which?
- a) Gives the position of an object
  - b) Tells how much and in which direction an object has changed its position
  - c) Represents rotational effect
  - d) Has a starting point of application
- 12) What is the magnitude of a unit vector?
- a) It has no magnitude
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  - d) Unity
- 13) Which of the following has zero magnitude?
- a) Fixed vector
  - b) Zero vector
  - c) Modulus of a vector
  - d) Unit vector
- 14) For motion in two or three dimensions, what is the angle between velocity and acceleration vectors?
- a)  $0^\circ$
  - b)  $180^\circ$
  - c) Between  $0^\circ$  and  $180^\circ$
  - d)  $90^\circ$

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**T.Y. (B.Tech.) (Sem – I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electromagnetic Engineering**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Solve any four:** **16**
- 1) Points P and Q are located at (1,-2,4) and (-5,4,2). Determine the position of vector P
  - 2) Find the scalar component of  $6a_x + 2a_y - 3a_z$  along  $3a_x - 4a_y$ .
  - 3) Explain Relationship between Cartesian and Cylindrical Co-ordinates.
  - 4) Explain Conditions of Gauss's Law.
  - 5) Explain Dielectrics in an Electric Field.
- Q.3 Solve any Two:** **12**
- 1) Explain Electric Field Intensity due to Dipole.
  - 2) Explain Poisson's and Laplace's Equations.
  - 3) Explain Electric Field Intensity.

**Section – II**

- Q.4 Solve any Four:** **16**
- 1) Explain Biot-Savart's Law.
  - 2) Explain Magnetic Flux Density.
  - 3) Explain Magnetic Dipole.
  - 4) Find H at center of an Equilateral triangular loop of side 4m carrying current of 5A.
  - 5) Write a short note on Inductors and Inductances.
- Q.5 Solve any Two:** **12**
- 1) Derive Energy density in the magnetic field.
  - 2) Derive Displacement current.
  - 3) A single turn rectangular loop of enclosed area 1 sq. m is situated in air with its plane normal to a magnetic field which varies at the rate of  $\text{wb/m}^2 \text{ sec}$ . Estimate emf induced in the loop.



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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Information Technology and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) An IT project can produce \_\_\_\_\_.  
 a) a system  
 b) a software package  
 c) recommendation based on study  
 d) all of these
- 2) Select appropriate sequence \_\_\_\_\_.  
 a) database, data, knowledge, information  
 b) data, database, knowledge, information  
 c) data, database, information, knowledge  
 d) information, database, knowledge, data
- 3) Which of below is an example of TPS \_\_\_\_\_.  
 a) business intelligence                      b) payroll  
 c) ERP                                              d) expert system
- 4) \_\_\_\_\_ and \_\_\_\_\_ are the two views of database  
 a) action, query                                      b) partitioned, replicated  
 c) information, knowledge                      d) physical, logical
- 5) The processes required to ensure that the project includes all the work required, is part of project \_\_\_\_\_ management.  
 a) integration                                      b) scope  
 c) cost                                              d) quality
- 6) A \_\_\_\_\_ query is simply a data retrieval query.  
 a) action                                              b) get  
 c) select                                              d) all of these
- 7) Two types of decision support systems are  
 a) model driven, data driven                      b) data based, information based  
 c) middle, upper                                      d) TPS, ERP



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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Information Technology and Management**

Day & Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Attempt any Two.** **12**

- a) Explain partitioned database with – diagram, advantages and disadvantages
- b) With suitable examples explain any two e - payment systems used in India.
- c) What are components of information system? Discuss with suitable diagram.

**Q.3 Attempt any Four.** **16**

- a) Differentiate – data mart Vs data warehouse
- b) Justify with example – IT flattens organization structure
- c) To whom IT supports in a typical organization?
- d) Discuss Cloud Computing - SAAS model
- e) How IT infrastructure for a typical organization is decided?

**Section – II**

**Q.4 Attempt any Two.** **12**

- a) Justify : IT projects are as complex as other engineering projects.
- b) Discuss need of and how supply chain management system is being implemented.
- c) Explain economical impact of IS on organization.

**Q.5 Attempt any Four.** **16**

- a) Discuss ethical issues related to information systems.
- b) With a typical example explain decision support system
- c) Compare OLAP and OLTP
- d) What is deskilling and alienation? Comment on how it is rising because of IT.
- e) What are the types of IPR?

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Information Technology and Management**

Day & Date: Thursday, 09-02-2023  
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Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Take odd man out – NEFT, ERP, RTGS, UPI
  - a) NEFT
  - b) ERP
  - c) RTGS
  - d) UPI
- 2) In \_\_\_\_\_ model, typically, the outcome of one phase acts as the input for the next phase sequentially.
  - a) RAD
  - b) Waterfall
  - c) Prototyping
  - d) SDLC
- 3) Which of below is not true about organizations?
  - a) closed system
  - b) social unit
  - c) interact with environment
  - d) have a structure
- 4) Which of below is a component of an IS?
  - a) Purpose
  - b) Context
  - c) Hardware
  - d) All of these
- 5) What for IS & IT are used in Digital Enterprises?
  - a) Research
  - b) Boost employee productive
  - c) Customer support
  - d) All of these
- 6) \_\_\_\_\_ are software system designed to support machine to machine interaction over a network
  - a) Information technology
  - b) Cloud computing
  - c) Web services
  - d) Apps
- 7) Take odd man out - MS Project, MS Access, DB2, Oracle
  - a) MS Word
  - b) MS Access
  - c) DB2
  - d) Oracle

- 8) An IT project can produce \_\_\_\_\_.  
a) a system  
b) a software package  
c) recommendation based on study  
d) all of these
- 9) Select appropriate sequence \_\_\_\_\_.  
a) database, data, knowledge, information  
b) data, database, knowledge, information  
c) data, database, information, knowledge  
d) information, database, knowledge, data
- 10) Which of below is an example of TPS \_\_\_\_\_.  
a) business intelligence                      b) payroll  
c) ERP                                              d) expert system
- 11) \_\_\_\_\_ and \_\_\_\_\_ are the two views of database  
a) action, query                                  b) partitioned, replicated  
c) information, knowledge                      d) physical, logical
- 12) The processes required to ensure that the project includes all the work required, is part of project \_\_\_\_\_ management.  
a) integration                                      b) scope  
c) cost                                                d) quality
- 13) A \_\_\_\_\_ query is simply a data retrieval query.  
a) action                                              b) get  
c) select                                               d) all of these
- 14) Two types of decision support systems are  
a) model driven, data driven                      b) data based, information based  
c) middle, upper                                      d) TPS, ERP

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T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022

**ELECTRICAL ENGINEERING****Information Technology and Management**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I****Q.2 Attempt any Two.** **12**

- a) Explain partitioned database with – diagram, advantages and disadvantages
- b) With suitable examples explain any two e - payment systems used in India.
- c) What are components of information system? Discuss with suitable diagram.

**Q.3 Attempt any Four.** **16**

- a) Differentiate – data mart Vs data warehouse
- b) Justify with example – IT flattens organization structure
- c) To whom IT supports in a typical organization?
- d) Discuss Cloud Computing - SAAS model
- e) How IT infrastructure for a typical organization is decided?

**Section – II****Q.4 Attempt any Two.** **12**

- a) Justify : IT projects are as complex as other engineering projects.
- b) Discuss need of and how supply chain management system is being implemented.
- c) Explain economical impact of IS on organization.

**Q.5 Attempt any Four.** **16**

- a) Discuss ethical issues related to information systems.
- b) With a typical example explain decision support system
- c) Compare OLAP and OLTP
- d) What is deskilling and alienation? Comment on how it is rising because of IT.
- e) What are the types of IPR?

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Information Technology and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which of below is a component of an IS?
 

|             |                 |
|-------------|-----------------|
| a) Purpose  | b) Context      |
| c) Hardware | d) All of these |
  
- 2) What for IS & IT are used in Digital Enterprises?
 

|                     |                              |
|---------------------|------------------------------|
| a) Research         | b) Boost employee productive |
| c) Customer support | d) All of these              |
  
- 3) \_\_\_\_\_ are software system designed to support machine to machine interaction over a network
 

|                           |                    |
|---------------------------|--------------------|
| a) Information technology | b) Cloud computing |
| c) Web services           | d) Apps            |
  
- 4) Take odd man out - MS Project, MS Access, DB2, Oracle
 

|            |              |
|------------|--------------|
| a) MS Word | b) MS Access |
| c) DB2     | d) Oracle    |
  
- 5) An IT project can produce \_\_\_\_\_.
 

|                                  |
|----------------------------------|
| a) a system                      |
| b) a software package            |
| c) recommendation based on study |
| d) all of these                  |
  
- 6) Select appropriate sequence \_\_\_\_\_.
 

|                                           |
|-------------------------------------------|
| a) database, data, knowledge, information |
| b) data, database, knowledge, information |
| c) data, database, information, knowledge |
| d) information, database, knowledge, data |
  
- 7) Which of below is an example of TPS \_\_\_\_\_.
 

|                          |                  |
|--------------------------|------------------|
| a) business intelligence | b) payroll       |
| c) ERP                   | d) expert system |





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T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022

**ELECTRICAL ENGINEERING****Information Technology and Management**

Day &amp; Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I****Q.2 Attempt any Two.** **12**

- a) Explain partitioned database with – diagram, advantages and disadvantages
- b) With suitable examples explain any two e - payment systems used in India.
- c) What are components of information system? Discuss with suitable diagram.

**Q.3 Attempt any Four.** **16**

- a) Differentiate – data mart Vs data warehouse
- b) Justify with example – IT flattens organization structure
- c) To whom IT supports in a typical organization?
- d) Discuss Cloud Computing - SAAS model
- e) How IT infrastructure for a typical organization is decided?

**Section – II****Q.4 Attempt any Two.** **12**

- a) Justify : IT projects are as complex as other engineering projects.
- b) Discuss need of and how supply chain management system is being implemented.
- c) Explain economical impact of IS on organization.

**Q.5 Attempt any Four.** **16**

- a) Discuss ethical issues related to information systems.
- b) With a typical example explain decision support system
- c) Compare OLAP and OLTP
- d) What is deskilling and alienation? Comment on how it is rising because of IT.
- e) What are the types of IPR?

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Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.
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- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

- 1) A \_\_\_\_\_ query is simply a data retrieval query.

|           |                 |
|-----------|-----------------|
| a) action | b) get          |
| c) select | d) all of these |
- 2) Two types of decision support systems are

|                              |                                  |
|------------------------------|----------------------------------|
| a) model driven, data driven | b) data based, information based |
| c) middle, upper             | d) TPS, ERP                      |
- 3) Take odd man out – NEFT, ERP, RTGS, UPI

|         |        |
|---------|--------|
| a) NEFT | b) ERP |
| c) RTGS | d) UPI |
- 4) In \_\_\_\_\_ model, typically, the outcome of one phase acts as the input for the next phase sequentially.

|                |              |
|----------------|--------------|
| a) RAD         | b) Waterfall |
| c) Prototyping | d) SDLC      |
- 5) Which of below is not true about organizations?

|                              |                     |
|------------------------------|---------------------|
| a) closed system             | b) social unit      |
| c) interact with environment | d) have a structure |
- 6) Which of below is a component of an IS?

|             |                 |
|-------------|-----------------|
| a) Purpose  | b) Context      |
| c) Hardware | d) All of these |
- 7) What for IS & IT are used in Digital Enterprises?

|                     |                              |
|---------------------|------------------------------|
| a) Research         | b) Boost employee productive |
| c) Customer support | d) All of these              |
- 8) \_\_\_\_\_ are software system designed to support machine to machine interaction over a network

|                           |                    |
|---------------------------|--------------------|
| a) Information technology | b) Cloud computing |
| c) Web services           | d) Apps            |

- 9) Take odd man out - MS Project, MS Access, DB2, Oracle
  - a) MS Word
  - b) MS Access
  - c) DB2
  - d) Oracle
- 10) An IT project can produce \_\_\_\_\_.
  - a) a system
  - b) a software package
  - c) recommendation based on study
  - d) all of these
- 11) Select appropriate sequence \_\_\_\_\_.
  - a) database, data, knowledge, information
  - b) data, database, knowledge, information
  - c) data, database, information, knowledge
  - d) information, database, knowledge, data
- 12) Which of below is an example of TPS \_\_\_\_\_.
  - a) business intelligence
  - b) payroll
  - c) ERP
  - d) expert system
- 13) \_\_\_\_\_ and \_\_\_\_\_ are the two views of database
  - a) action, query
  - b) partitioned, replicated
  - c) information, knowledge
  - d) physical, logical
- 14) The processes required to ensure that the project includes all the work required, is part of project \_\_\_\_\_ management.
  - a) integration
  - b) scope
  - c) cost
  - d) quality

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Information Technology and Management**

Day & Date: Thursday, 09-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate full marks.

**Section – I**

**Q.2 Attempt any Two.** **12**

- a) Explain partitioned database with – diagram, advantages and disadvantages
- b) With suitable examples explain any two e - payment systems used in India.
- c) What are components of information system? Discuss with suitable diagram.

**Q.3 Attempt any Four.** **16**

- a) Differentiate – data mart Vs data warehouse
- b) Justify with example – IT flattens organization structure
- c) To whom IT supports in a typical organization?
- d) Discuss Cloud Computing - SAAS model
- e) How IT infrastructure for a typical organization is decided?

**Section – II**

**Q.4 Attempt any Two.** **12**

- a) Justify : IT projects are as complex as other engineering projects.
- b) Discuss need of and how supply chain management system is being implemented.
- c) Explain economical impact of IS on organization.

**Q.5 Attempt any Four.** **16**

- a) Discuss ethical issues related to information systems.
- b) With a typical example explain decision support system
- c) Compare OLAP and OLTP
- d) What is deskilling and alienation? Comment on how it is rising because of IT.
- e) What are the types of IPR?

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Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

## 14

- 1) Electric vehicle & Hybrid vehicle is having following components common except \_\_\_\_\_.  
a) Battery  
b) ECU  
c) Generator  
d) Internal Combustion Engine
- 2) \_\_\_\_\_ hybrid vehicle is propelled by ICE or Battery.  
a) Parallel  
b) Series  
c) Split  
d) Mild
- 3) Lowest Degree of Hybridization is observed in \_\_\_\_\_.  
a) Full hybrid  
b) Mild hybrid  
c) Split hybrid  
d) Micro hybrid
- 4) Mild hybrid uses \_\_\_\_\_ volt battery.  
a) 12  
b) 24  
c) 48  
d) 60
- 5) Objective behind using hybrid vehicle is \_\_\_\_\_.  
a) Reduction in fuel consumption  
b) Reduction in emission  
c) Increased Power & torque  
d) All
- 6) A plug-in hybrid is different from conventional hybrid vehicle \_\_\_\_\_.  
a) Built in battery charger  
b) More batteries  
c) Conventional batteries  
d) Bigger motor generator
- 7) EVSE stands for \_\_\_\_\_.  
a) Electric vehicle supply equipment  
b) Could be AC or DC  
c) Used for charging  
d) All
- 8) Hybrid vehicle normally have \_\_\_\_\_ km range only electric mode.  
a) 10-20km  
b) 30-70km  
c) 100-km  
d) No limit



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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Hybrid Electric Vehicle Design**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Solve any four** **16**
- Explain about the history of hybrid & electric vehicle.
  - Explain about the social and environmental importance of EV & HEV.
  - Under what condition a pure EV can be chosen as a best option compared to hybrid vehicles considering the impact on climate change.
  - Explain about vehicle power plant characteristics.
  - What are the supporting systems in an electric/ hybrid vehicle.
- Q.3 Solve any Two** **12**
- Explain the components of HEV & its types?
  - Explain the impact of modern drive trains on energy supply?
  - What is its typical value for Induction Motors used in HEV?

**Section – II**

- Q.4 Solve any four** **16**
- Why energy management control system is required in an HEV?
  - With the help of block diagram explain battery management supporting system of HEV?
  - Explain briefly the electrical & mechanical constraints to be considered while sizing an electrical machine for HEV?
  - Draw the typical: torque speed envelopes curves of drive train motors and how the continuous, intermittent and peak overloading ratings?
  - What are the desired features of motors used in the HEV?
- Q.5 Solve any Two** **12**
- Explain the operation, the advantages & disadvantages of flywheel energy storage?
  - Explain the working of fuel cell and state its limitations?
  - Explain the fundamentals of regenerative braking system used in HEV?

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Hybrid Electric Vehicle Design**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Hybrid vehicle normally have \_\_\_\_\_ km range only electric mode.
 

|            |             |
|------------|-------------|
| a) 10-20km | b) 30-70km  |
| c) 100-km  | d) No limit |
- 2) The main sources of electricity for hybrids are \_\_\_\_\_.
 

|               |              |
|---------------|--------------|
| a) Batteries  | b) FCs       |
| c) Capacitors | d) All these |
- 3) Regenerative braking involves \_\_\_\_\_.
 

|                                                              |
|--------------------------------------------------------------|
| a) Nano fibres that repair the surface of the brake pad      |
| b) Reduce the amount of friction necessary to slower the car |
| c) Reclaiming heat from the brakes and using it for power    |
| d) None of these                                             |
- 4) Select the cycle used in the hybrid Engine \_\_\_\_\_.
 

|             |               |
|-------------|---------------|
| a) Otto     | b) Diesel     |
| c) Atkinson | d) Isentropic |
- 5) Select the features of hybrid electric vehicle \_\_\_\_\_.
 

|                         |                 |
|-------------------------|-----------------|
| a) Idle stop & EV drive | b) Motor assist |
| c) Regenerative braking | d) All of these |
- 6) Breaking and idling loses are \_\_\_\_\_ in urban driving & even more in congested driving.
 

|                    |                   |
|--------------------|-------------------|
| a) Moderately high | b) Moderately low |
| c) Extremely high  | d) Extremely low  |
- 7) Which of the following is Not the type of hybrid vehicle?
 

|                             |                    |
|-----------------------------|--------------------|
| a) Plug -in hybrid          | b) Parallel hybrid |
| c) Natural gas for vehicles | d) Series hybrid   |
- 8) Electric vehicle & Hybrid vehicle is having following components common except \_\_\_\_\_.
 

|              |                               |
|--------------|-------------------------------|
| a) Battery   | b) ECU                        |
| c) Generator | d) Internal Combustion Engine |



- 9) \_\_\_\_\_ hybrid vehicle is propelled by ICE or Battery.
- a) Parallel
  - b) Series
  - c) Split
  - d) Mild
- 10) Lowest Degree of Hybridization is observed in \_\_\_\_\_.
- a) Full hybrid
  - b) Mild hybrid
  - c) Split hybrid
  - d) Micro hybrid
- 11) Mild hybrid uses \_\_\_\_\_ volt battery.
- a) 12
  - b) 24
  - c) 48
  - d) 60
- 12) Objective behind using hybrid vehicle is \_\_\_\_\_.
- a) Reduction in fuel consumption
  - b) Reduction in emission
  - c) Increased Power & torque
  - d) All
- 13) A plug-in hybrid is different from conventional hybrid vehicle \_\_\_\_\_.
- a) Built in battery charger
  - b) More batteries
  - c) Conventional batteries
  - d) Bigger motor generator
- 14) EVSE stands for \_\_\_\_\_.
- a) Electric vehicle supply equipment
  - b) Could be AC or DC
  - c) Used for charging
  - d) All

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Hybrid Electric Vehicle Design**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain about the history of hybrid & electric vehicle.
- b) Explain about the social and environmental importance of EV & HEV.
- c) Under what condition a pure EV can be chosen as a best option compared to hybrid vehicles considering the impact on climate change.
- d) Explain about vehicle power plant characteristics.
- e) What are the supporting systems in an electric/ hybrid vehicle.

**Q.3 Solve any Two** **12**

- a) Explain the components of HEV & its types?
- b) Explain the impact of modern drive trains on energy supply?
- c) What is its typical value for Induction Motors used in HEV?

**Section – II**

**Q.4 Solve any four** **16**

- a) Why energy management control system is required in an HEV?
- b) With the help of block diagram explain battery management supporting system of HEV?
- c) Explain briefly the electrical & mechanical constraints to be considered while sizing an electrical machine for HEV?
- d) Draw the typical: torque speed envelopes curves of drive train motors and how the continuous, intermittent and peak overloading ratings?
- e) What are the desired features of motors used in the HEV?

**Q.5 Solve any Two** **12**

- a) Explain the operation, the advantages & disadvantages of flywheel energy storage?
- b) Explain the working of fuel cell and state its limitations?
- c) Explain the fundamentals of regenerative braking system used in HEV?

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Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

## 14

- 1) Select the cycle used in the hybrid Engine \_\_\_\_\_.  
a) Otto  
b) Diesel  
c) Atkinson  
d) Isentropic
- 2) Select the features of hybrid electric vehicle \_\_\_\_\_.  
a) Idle stop & EV drive  
b) Motor assist  
c) Regenerative braking  
d) All of these
- 3) Breaking and idling losses are \_\_\_\_\_ in urban driving & even more in congested driving.  
a) Moderately high  
b) Moderately low  
c) Extremely high  
d) Extremely low
- 4) Which of the following is Not the type of hybrid vehicle?  
a) Plug-in hybrid  
b) Parallel hybrid  
c) Natural gas for vehicles  
d) Series hybrid
- 5) Electric vehicle & Hybrid vehicle is having following components common except \_\_\_\_\_.  
a) Battery  
b) ECU  
c) Generator  
d) Internal Combustion Engine
- 6) \_\_\_\_\_ hybrid vehicle is propelled by ICE or Battery.  
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b) Series  
c) Split  
d) Mild
- 7) Lowest Degree of Hybridization is observed in \_\_\_\_\_.  
a) Full hybrid  
b) Mild hybrid  
c) Split hybrid  
d) Micro hybrid
- 8) Mild hybrid uses \_\_\_\_\_ volt battery.  
a) 12  
b) 24  
c) 48  
d) 60
- 9) Objective behind using hybrid vehicle is \_\_\_\_\_.  
a) Reduction in fuel consumption  
b) Reduction in emission  
c) Increased Power & torque  
d) All

- 10)** A plug-in hybrid is different from conventional hybrid vehicle \_\_\_\_\_.  
a) Built in battery charger                      b) More batteries  
c) Conventional batteries                      d) Bigger motor generator
- 11)** EVSE stands for \_\_\_\_\_.  
a) Electric vehicle supply equipment  
b) Could be AC or DC  
c) Used for charging  
d) All
- 12)** Hybrid vehicle normally have \_\_\_\_\_ km range only electric mode.  
a) 10-20km                                              b) 30-70km  
c) 100-km                                              d) No limit
- 13)** The main sources of electricity for hybrids are \_\_\_\_\_.  
a) Batteries                                              b) FCs  
c) Capacitors                                              d) All these
- 14)** Regenerative braking involves \_\_\_\_\_.  
a) Nano fibres that repair the surface of the brake pad  
b) Reduce the amount of friction necessary to slower the car  
c) Reclaiming heat from the brakes and using it for power  
d) None of these

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Hybrid Electric Vehicle Design**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Solve any four** **16**
- a) Explain about the history of hybrid & electric vehicle.
  - b) Explain about the social and environmental importance of EV & HEV.
  - c) Under what condition a pure EV can be chosen as a best option compared to hybrid vehicles considering the impact on climate change.
  - d) Explain about vehicle power plant characteristics.
  - e) What are the supporting systems in an electric/ hybrid vehicle.
- Q.3 Solve any Two** **12**
- a) Explain the components of HEV & its types?
  - b) Explain the impact of modern drive trains on energy supply?
  - c) What is its typical value for Induction Motors used in HEV?

**Section – II**

- Q.4 Solve any four** **16**
- a) Why energy management control system is required in an HEV?
  - b) With the help of block diagram explain battery management supporting system of HEV?
  - c) Explain briefly the electrical & mechanical constraints to be considered while sizing an electrical machine for HEV?
  - d) Draw the typical: torque speed envelopes curves of drive train motors and how the continuous, intermittent and peak overloading ratings?
  - e) What are the desired features of motors used in the HEV?
- Q.5 Solve any Two** **12**
- a) Explain the operation, the advantages & disadvantages of flywheel energy storage?
  - b) Explain the working of fuel cell and state its limitations?
  - c) Explain the fundamentals of regenerative braking system used in HEV?

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Hybrid Electric Vehicle Design**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
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 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A plug-in hybrid is different from conventional hybrid vehicle \_\_\_\_\_.  
 a) Built in battery charger                      b) More batteries  
 c) Conventional batteries                      d) Bigger motor generator
- 2) EVSE stands for \_\_\_\_\_.  
 a) Electric vehicle supply equipment  
 b) Could be AC or DC  
 c) Used for charging  
 d) All
- 3) Hybrid vehicle normally have \_\_\_\_\_ km range only electric mode.  
 a) 10-20km                                              b) 30-70km  
 c) 100-km                                              d) No limit
- 4) The main sources of electricity for hybrids are \_\_\_\_\_.  
 a) Batteries                                              b) FCs  
 c) Capacitors                                              d) All these
- 5) Regenerative braking involves \_\_\_\_\_.  
 a) Nano fibres that repair the surface of the brake pad  
 b) Reduce the amount of friction necessary to slower the car  
 c) Reclaiming heat from the brakes and using it for power  
 d) None of these
- 6) Select the cycle used in the hybrid Engine \_\_\_\_\_.  
 a) Otto                                                      b) Diesel  
 c) Atkinson                                              d) Isentropic
- 7) Select the features of hybrid electric vehicle \_\_\_\_\_.  
 a) Idle stop & EV drive                              b) Motor assist  
 c) Regenerative braking                              d) All of these
- 8) Breaking and idling loses are \_\_\_\_\_ in urban driving & even more in congested driving.  
 a) Moderately high                                      b) Moderately low  
 c) Extremely high                                      d) Extremely low

- 9) Which of the following is Not the type of hybrid vehicle?  
a) Plug -in hybrid                      b) Parallel hybrid  
c) Natural gas for vehicles              d) Series hybrid
- 10) Electric vehicle & Hybrid vehicle is having following components common except \_\_\_\_\_.  
a) Battery                                      b) ECU  
c) Generator                                  d) Internal Combustion Engine
- 11) \_\_\_\_\_ hybrid vehicle is propelled by ICE or Battery.  
a) Parallel                                      b) Series  
c) Split                                          d) Mild
- 12) Lowest Degree of Hybridization is observed in \_\_\_\_\_.  
a) Full hybrid                                  b) Mild hybrid  
c) Split hybrid                                d) Micro hybrid
- 13) Mild hybrid uses \_\_\_\_\_ volt battery.  
a) 12                                              b) 24  
c) 48                                              d) 60
- 14) Objective behind using hybrid vehicle is \_\_\_\_\_.  
a) Reduction in fuel consumption      b) Reduction in emission  
c) Increased Power & torque              d) All

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Hybrid Electric Vehicle Design**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain about the history of hybrid & electric vehicle.
- b) Explain about the social and environmental importance of EV & HEV.
- c) Under what condition a pure EV can be chosen as a best option compared to hybrid vehicles considering the impact on climate change.
- d) Explain about vehicle power plant characteristics.
- e) What are the supporting systems in an electric/ hybrid vehicle.

**Q.3 Solve any Two** **12**

- a) Explain the components of HEV & its types?
- b) Explain the impact of modern drive trains on energy supply?
- c) What is its typical value for Induction Motors used in HEV?

**Section – II**

**Q.4 Solve any four** **16**

- a) Why energy management control system is required in an HEV?
- b) With the help of block diagram explain battery management supporting system of HEV?
- c) Explain briefly the electrical & mechanical constraints to be considered while sizing an electrical machine for HEV?
- d) Draw the typical: torque speed envelopes curves of drive train motors and how the continuous, intermittent and peak overloading ratings?
- e) What are the desired features of motors used in the HEV?

**Q.5 Solve any Two** **12**

- a) Explain the operation, the advantages & disadvantages of flywheel energy storage?
- b) Explain the working of fuel cell and state its limitations?
- c) Explain the fundamentals of regenerative braking system used in HEV?



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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options.**

**14**

- 1) Which is not one of the natures of ethics?
  - a) Focus on human values
  - b) Social work
  - c) Branch of philosophy
  - d) Applies moral principles
- 2) Why business ethics are important?
  - a) It formulates the firm's image and builds the brand
  - b) It influences the buying decision of the customers
  - c) Build confidence within employees
  - d) All of the above
- 3) Which one of the following is not principle business ethics?
  - a) Principle of universality
  - b) Principle of humanity
  - c) Principle of autonomy
  - d) Principle of dissatisfaction
- 4) Code of conduct does not include \_\_\_\_\_.
 

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| a) Dishonesty | b) Rules     |
| c) Morality   | d) Integrity |
- 5) What is meant by the phrase CSR?
  - a) Corporate Social Responsibility
  - b) Company Social Responsibility
  - c) Corporate Society Responsibility
  - d) Company Society Responsibility
- 6) Ethics should guide the technology towards \_\_\_\_\_.
  - a) Political justice
  - b) Cultural justice
  - c) Social justice
  - d) None of the Above

- 7) The factor which affects ethical and unethical behavior is \_\_\_\_\_
- a) Ethical dilemma
  - b) Diversity
  - c) Teamwork
  - d) Open communication
- 8) The hand-of-government refers to the \_\_\_\_\_
- a) ability of the government to interfere in business negotiations
  - b) role of corporations to be profitable within the law
  - c) effect of national politics on business decisions
  - d) impact of changing government regulations
- 9) Which of the following relating to CSR theories is correct?
- a) Institutional theory is based on the shareholder concept.
  - b) Social contract is the key concept of legitimacy theory.
  - c) The key concept of enlightened self-interest is stakeholder relations.
  - d) Stakeholder theory requires organizations to manage community perceptions to survive.
- 10) The moral principles, standards of behavior, or set of values that guide a person's actions in the workplace is called-
- a) Office place ethics
  - b) Factory place ethics
  - c) Behavioral ethics
  - d) Workplace ethics
- 11) Codes of conduct and codes of ethics \_\_\_\_\_
- a) are formal statements that describe what an organization expects of its employees.
  - b) become necessary only after a company has been in legal trouble.
  - c) are designed for top executives and managers, not regular employees.
  - d) rarely become an effective component of the ethics and compliance program.
- 12) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
- a) Integrity
  - b) Accountability
  - c) Openness
  - d) Acceptability
- 13) Which of the following would most effectively act as the primary objective of a business organization?
- a) To make a profit
  - b) To procure resources
  - c) To communicate with shareholders
  - d) To mediate between the organization and the environment
- 14) The four types of social responsibility include:
- a) legal, philanthropic, economic, and ethical
  - b) ethical, moral, social, and economic
  - c) philanthropic, justice, economic, and ethical
  - d) legal, moral, ethical, and economic

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory  
2) Figures to right indicate full marks

**Section – I**

**Q.2 Solve any four of the following** **16**

- 1) Discuss various principles of ethics and its implications in the modern business world
- 2) Explain nature and need of business ethics.
- 3) Explain the concept of corporate social responsibility (CSR).
- 4) Mention the ethical issues that arise for managers.
- 5) Explain the steps for setting standards of ethical behavior.

**Q.3 Solve any two of the following** **12**

- 1) Explain 'Normative Ethics' in management.
- 2) How are the ethical decisions made? Which factors involved in decision making? Give an example.
- 3) Explain forces inducing social responsibility, objectives and importance of CSR.

**Section – II**

**Q.4 Solve any four of the following** **16**

- 1) Explain ethical issues in the firm-employee relationship.
- 2) Explain ethical and social issues in marketing.
- 3) Explain the business ethics for pollution control.
- 4) Explain the essential elements of corporate governance.
- 5) Explain moral significance of information technology to business.

**Q.5 Solve any two of the following** **12**

- 1) Explain the important parameters of environmental ethics.
- 2) Explain ethical issues in the relation between business and government.
- 3) Explain the relation between business ethics and environmental values.

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options.**

**14**

- 1) The hand-of-government refers to the \_\_\_\_\_
  - a) ability of the government to interfere in business negotiations
  - b) role of corporations to be profitable within the law
  - c) effect of national politics on business decisions
  - d) impact of changing government regulations
- 2) Which of the following relating to CSR theories is correct?
  - a) Institutional theory is based on the shareholder concept.
  - b) Social contract is the key concept of legitimacy theory.
  - c) The key concept of enlightened self-interest is stakeholder relations.
  - d) Stakeholder theory requires organizations to manage community perceptions to survive.
- 3) The moral principles, standards of behavior, or set of values that guide a person's actions in the workplace is called-
  - a) Office place ethics
  - b) Factory place ethics
  - c) Behavioral ethics
  - d) Workplace ethics
- 4) Codes of conduct and codes of ethics \_\_\_\_\_
  - a) are formal statements that describe what an organization expects of its employees.
  - b) become necessary only after a company has been in legal trouble.
  - c) are designed for top executives and managers, not regular employees.
  - d) rarely become an effective component of the ethics and compliance program.
- 5) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
  - a) Integrity
  - b) Accountability
  - c) Openness
  - d) Acceptability

- 6) Which of the following would most effectively act as the primary objective of a business organization?
- a) To make a profit
  - b) To procure resources
  - c) To communicate with shareholders
  - d) To mediate between the organization and the environment
- 7) The four types of social responsibility include:
- a) legal, philanthropic, economic, and ethical
  - b) ethical, moral, social, and economic
  - c) philanthropic, justice, economic, and ethical
  - d) legal, moral, ethical, and economic
- 8) Which is not one of the natures of ethics?
- a) Focus on human values
  - b) Social work
  - c) Branch of philosophy
  - d) Applies moral principles
- 9) Why business ethics are important?
- a) It formulates the firm's image and builds the brand
  - b) It influences the buying decision of the customers
  - c) Build confidence within employees
  - d) All of the above
- 10) Which one of the following is not principle business ethics?
- a) Principle of universality
  - b) Principle of humanity
  - c) Principle of autonomy
  - d) Principle of dissatisfaction
- 11) Code of conduct does not include \_\_\_\_.
- a) Dishonesty
  - b) Rules
  - c) Morality
  - d) Integrity
- 12) What is meant by the phrase CSR?
- a) Corporate Social Responsibility
  - b) Company Social Responsibility
  - c) Corporate Society Responsibility
  - d) Company Society Responsibility
- 13) Ethics should guide the technology towards \_\_\_\_.
- a) Political justice
  - b) Cultural justice
  - c) Social justice
  - d) None of the Above
- 14) The factor which affects ethical and unethical behavior is \_\_\_\_.
- a) Ethical dilemma
  - b) Diversity
  - c) Teamwork
  - d) Open communication

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory  
2) Figures to right indicate full marks

**Section – I**

**Q.2 Solve any four of the following** **16**

- 1) Discuss various principles of ethics and its implications in the modern business world
- 2) Explain nature and need of business ethics.
- 3) Explain the concept of corporate social responsibility (CSR).
- 4) Mention the ethical issues that arise for managers.
- 5) Explain the steps for setting standards of ethical behavior.

**Q.3 Solve any two of the following** **12**

- 1) Explain 'Normative Ethics' in management.
- 2) How are the ethical decisions made? Which factors involved in decision making? Give an example.
- 3) Explain forces inducing social responsibility, objectives and importance of CSR.

**Section – II**

**Q.4 Solve any four of the following** **16**

- 1) Explain ethical issues in the firm-employee relationship.
- 2) Explain ethical and social issues in marketing.
- 3) Explain the business ethics for pollution control.
- 4) Explain the essential elements of corporate governance.
- 5) Explain moral significance of information technology to business.

**Q.5 Solve any two of the following** **12**

- 1) Explain the important parameters of environmental ethics.
- 2) Explain ethical issues in the relation between business and government.
- 3) Explain the relation between business ethics and environmental values.

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options. 14**

- 1) Codes of conduct and codes of ethics \_\_\_\_\_
  - a) are formal statements that describe what an organization expects of its employees.
  - b) become necessary only after a company has been in legal trouble.
  - c) are designed for top executives and managers, not regular employees.
  - d) rarely become an effective component of the ethics and compliance program.
- 2) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
  - a) Integrity
  - b) Accountability
  - c) Openness
  - d) Acceptability
- 3) Which of the following would most effectively act as the primary objective of a business organization?
  - a) To make a profit
  - b) To procure resources
  - c) To communicate with shareholders
  - d) To mediate between the organization and the environment
- 4) The four types of social responsibility include:
  - a) legal, philanthropic, economic, and ethical
  - b) ethical, moral, social, and economic
  - c) philanthropic, justice, economic, and ethical
  - d) legal, moral, ethical, and economic
- 5) Which is not one of the natures of ethics?
  - a) Focus on human values
  - b) Social work
  - c) Branch of philosophy
  - d) Applies moral principles

- 6) Why business ethics are important?
- a) It formulates the firm's image and builds the brand
  - b) It influences the buying decision of the customers
  - c) Build confidence within employees
  - d) All of the above
- 7) Which one of the following is not principle business ethics?
- a) Principle of universality
  - b) Principle of humanity
  - c) Principle of autonomy
  - d) Principle of dissatisfaction
- 8) Code of conduct does not include \_\_\_\_\_
- a) Dishonesty
  - b) Rules
  - c) Morality
  - d) Integrity
- 9) What is meant by the phrase CSR?
- a) Corporate Social Responsibility
  - b) Company Social Responsibility
  - c) Corporate Society Responsibility
  - d) Company Society Responsibility
- 10) Ethics should guide the technology towards \_\_\_\_\_.
- a) Political justice
  - b) Cultural justice
  - c) Social justice
  - d) None of the Above
- 11) The factor which affects ethical and unethical behavior is \_\_\_\_\_
- a) Ethical dilemma
  - b) Diversity
  - c) Teamwork
  - d) Open communication
- 12) The hand-of-government refers to the \_\_\_\_\_
- a) ability of the government to interfere in business negotiations
  - b) role of corporations to be profitable within the law
  - c) effect of national politics on business decisions
  - d) impact of changing government regulations
- 13) Which of the following relating to CSR theories is correct?
- a) Institutional theory is based on the shareholder concept.
  - b) Social contract is the key concept of legitimacy theory.
  - c) The key concept of enlightened self-interest is stakeholder relations.
  - d) Stakeholder theory requires organizations to manage community perceptions to survive.
- 14) The moral principles, standards of behavior, or set of values that guide a person's actions in the workplace is called-
- a) Office place ethics
  - b) Factory place ethics
  - c) Behavioral ethics
  - d) Workplace ethics



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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory  
 2) Figures to right indicate full marks

**Section – I**

**Q.2 Solve any four of the following** **16**

- 1) Discuss various principles of ethics and its implications in the modern business world
- 2) Explain nature and need of business ethics.
- 3) Explain the concept of corporate social responsibility (CSR).
- 4) Mention the ethical issues that arise for managers.
- 5) Explain the steps for setting standards of ethical behavior.

**Q.3 Solve any two of the following** **12**

- 1) Explain 'Normative Ethics' in management.
- 2) How are the ethical decisions made? Which factors involved in decision making? Give an example.
- 3) Explain forces inducing social responsibility, objectives and importance of CSR.

**Section – II**

**Q.4 Solve any four of the following** **16**

- 1) Explain ethical issues in the firm-employee relationship.
- 2) Explain ethical and social issues in marketing.
- 3) Explain the business ethics for pollution control.
- 4) Explain the essential elements of corporate governance.
- 5) Explain moral significance of information technology to business.

**Q.5 Solve any two of the following** **12**

- 1) Explain the important parameters of environmental ethics.
- 2) Explain ethical issues in the relation between business and government.
- 3) Explain the relation between business ethics and environmental values.

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options.**

**14**

- 1) Ethics should guide the technology towards \_\_\_\_\_.
  - a) Political justice
  - b) Cultural justice
  - c) Social justice
  - d) None of the Above
- 2) The factor which affects ethical and unethical behavior is \_\_\_\_\_.
  - a) Ethical dilemma
  - b) Diversity
  - c) Teamwork
  - d) Open communication
- 3) The hand-of-government refers to the \_\_\_\_\_.
  - a) ability of the government to interfere in business negotiations
  - b) role of corporations to be profitable within the law
  - c) effect of national politics on business decisions
  - d) impact of changing government regulations
- 4) Which of the following relating to CSR theories is correct?
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  - c) The key concept of enlightened self-interest is stakeholder relations.
  - d) Stakeholder theory requires organizations to manage community perceptions to survive.
- 5) The moral principles, standards of behavior, or set of values that guide a person's actions in the workplace is called-
  - a) Office place ethics
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  - c) Behavioral ethics
  - d) Workplace ethics

- 6) Codes of conduct and codes of ethics \_\_\_\_\_
- a) are formal statements that describe what an organization expects of its employees.
  - b) become necessary only after a company has been in legal trouble.
  - c) are designed for top executives and managers, not regular employees.
  - d) rarely become an effective component of the ethics and compliance program.
- 7) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
- a) Integrity
  - b) Accountability
  - c) Openness
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- 8) Which of the following would most effectively act as the primary objective of a business organization?
- a) To make a profit
  - b) To procure resources
  - c) To communicate with shareholders
  - d) To mediate between the organization and the environment
- 9) The four types of social responsibility include:
- a) legal, philanthropic, economic, and ethical
  - b) ethical, moral, social, and economic
  - c) philanthropic, justice, economic, and ethical
  - d) legal, moral, ethical, and economic
- 10) Which is not one of the natures of ethics?
- a) Focus on human values
  - b) Social work
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- 11) Why business ethics are important?
- a) It formulates the firm's image and builds the brand
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- 12) Which one of the following is not principle business ethics?
- a) Principle of universality
  - b) Principle of humanity
  - c) Principle of autonomy
  - d) Principle of dissatisfaction
- 13) Code of conduct does not include \_\_\_\_\_
- a) Dishonesty
  - b) Rules
  - c) Morality
  - d) Integrity
- 14) What is meant by the phrase CSR?
- a) Corporate Social Responsibility
  - b) Company Social Responsibility
  - c) Corporate Society Responsibility
  - d) Company Society Responsibility

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Business Ethics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory  
2) Figures to right indicate full marks

**Section – I**

**Q.2 Solve any four of the following** **16**

- 1) Discuss various principles of ethics and its implications in the modern business world
- 2) Explain nature and need of business ethics.
- 3) Explain the concept of corporate social responsibility (CSR).
- 4) Mention the ethical issues that arise for managers.
- 5) Explain the steps for setting standards of ethical behavior.

**Q.3 Solve any two of the following** **12**

- 1) Explain 'Normative Ethics' in management.
- 2) How are the ethical decisions made? Which factors involved in decision making? Give an example.
- 3) Explain forces inducing social responsibility, objectives and importance of CSR.

**Section – II**

**Q.4 Solve any four of the following** **16**

- 1) Explain ethical issues in the firm-employee relationship.
- 2) Explain ethical and social issues in marketing.
- 3) Explain the business ethics for pollution control.
- 4) Explain the essential elements of corporate governance.
- 5) Explain moral significance of information technology to business.

**Q.5 Solve any two of the following** **12**

- 1) Explain the important parameters of environmental ethics.
- 2) Explain ethical issues in the relation between business and government.
- 3) Explain the relation between business ethics and environmental values.

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P

**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following areas of economic theory is the single most important element of managerial economics?
  - a) Mathematical economics
  - b) Econometrics
  - c) Macroeconomics
  - d) Microeconomics
- 2) Which of the following is defined as the study of the aggregate economy studied as a whole?
  - a) Mathematical economics
  - b) Econometrics
  - c) Macroeconomics
  - d) Microeconomics
- 3) "Capitalism" refers to:
  - a) the use of markets
  - b) government ownership of capital goods
  - c) private ownership of capital goods
  - d) private ownership of homes & cars
- 4) What will happen in the rice market if buyers are expecting higher prices in the near future?
  - a) The demand for rice will increase.
  - b) The demand for rice will decrease.
  - c) The demand for rice will be unaffected.
  - d) The supply of rice will increase.
- 5) When there is a shortage in a market
  - a) there is downward pressure on price
  - b) there is upward pressure on price
  - c) the market could still be in equilibrium
  - d) the price must be above equilibrium
- 6) A positive cross elasticity of demand coefficient indicates that:
  - a) a product is an inferior good
  - b) a product is a normal good
  - c) two products are substitute goods
  - d) two products are complementary goods

- 7) Total revenue falls as the price of a good increases if price elasticity of demand is:
- a) Elastic
  - b) Inelastic
  - c) unitary elastic
  - d) perfectly elastic
- 8) Which of the following is not a qualitative forecasting technique?
- a) Surveys of consumer expenditure plans
  - b) Perspectives of foreign advisory councils
  - c) Consumer intention polling
  - d) Time-series analysis
- 9) The best use of linear programming is to find optimal use of
- a) Money
  - b) Manpower
  - c) Machine
  - d) All of the above
- 10) Theory of production includes:
- a) Manufacturing
  - b) Packaging
  - c) Storing
  - d) All of these
- 11) Implicit costs are:
- a) equal to total fixed costs.
  - b) comprised entirely of variable costs.
  - c) "payments" for self-employed resources.
  - d) always greater in the short run than in the long run.
- 12) Which of the following costs are expenses that change in proportion to the activity of a business?
- a) Variable cost
  - b) Fixed cost
  - c) Material cost
  - d) All the above
- 13) Under which of the following forms of market structure does a firm has no control over the price of its product?
- a) Monopoly
  - b) Oligopoly
  - c) Monopolistic competition
  - d) Perfect competition
- 14) In perfect competition, a firm maximizes profit in the short run by deciding
- a) how much output to produce
  - b) whether or not to enter a market
  - c) what price to charge
  - d) how much capital to use

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**Set****P**

**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- 1) Explain scope of managerial economics for business decision.
- 2) Explain the following terms
  - a) Microeconomics
  - b) Macroeconomics
- 3) State & explain the law of demand and law of supply.
- 4) Explain the concept of price ceilings and price floors.
- 5) Describe price elasticity of demand in detail.
- 6) Explain the concept income elasticity of demand.

**Q.3 Solve Any Two** **12**

- 1) Explain economics contribution to managerial decision.
- 2) State and explain the determinants of demand.
- 3) Explain elasticity of supply. Also state the factors affecting the elasticity of supply.

**Section – II**

**Q.4 Solve Any Four** **16**

- 1) Explain barometric method for demand forecasting.
- 2) State and explain the applications of linear programming techniques.
- 3) Describe breakeven analysis. Also state the limitations of breakeven analysis.
- 4) Explain the concept profit margin of safety.
- 5) What is market? Explain the various types of market.
- 6) State and explain the characteristics of market structure.

**Q.5 Solve Any Two** **12**

- 1) Explain trend projection method for demand forecasting.
- 2) Explain pricing decision and monopoly power in detail.
- 3) Explain following costs of production:
  - a) Fixed and Variable Costs
  - b) Total, Average, and Marginal Costs
  - c) Short-Run and Long-Run Costs

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not a qualitative forecasting technique?
  - a) Surveys of consumer expenditure plans
  - b) Perspectives of foreign advisory councils
  - c) Consumer intention polling
  - d) Time-series analysis
- 2) The best use of linear programming is to find optimal use of
  - a) Money
  - b) Manpower
  - c) Machine
  - d) All of the above
- 3) Theory of production includes:
  - a) Manufacturing
  - b) Packaging
  - c) Storing
  - d) All of these
- 4) Implicit costs are:
  - a) equal to total fixed costs.
  - b) comprised entirely of variable costs.
  - c) "payments" for self-employed resources.
  - d) always greater in the short run than in the long run.
- 5) Which of the following costs are expenses that change in proportion to the activity of a business?
  - a) Variable cost
  - b) Fixed cost
  - c) Material cost
  - d) All the above
- 6) Under which of the following forms of market structure does a firm has no control over the price of its product?
  - a) Monopoly
  - b) Oligopoly
  - c) Monopolistic competition
  - d) Perfect competition
- 7) In perfect competition, a firm maximizes profit in the short run by deciding
  - a) how much output to produce
  - b) whether or not to enter a market
  - c) what price to charge
  - d) how much capital to use



- 8) Which of the following areas of economic theory is the single most important element of managerial economics?
- a) Mathematical economics
  - b) Econometrics
  - c) Macroeconomics
  - d) Microeconomics
- 9) Which of the following is defined as the study of the aggregate economy studied as a whole?
- a) Mathematical economics
  - b) Econometrics
  - c) Macroeconomics
  - d) Microeconomics
- 10) "Capitalism" refers to:
- a) the use of markets
  - b) government ownership of capital goods
  - c) private ownership of capital goods
  - d) private ownership of homes & cars
- 11) What will happen in the rice market if buyers are expecting higher prices in the near future?
- a) The demand for rice will increase.
  - b) The demand for rice will decrease.
  - c) The demand for rice will be unaffected.
  - d) The supply of rice will increase.
- 12) When there is a shortage in a market
- a) there is downward pressure on price
  - b) there is upward pressure on price
  - c) the market could still be in equilibrium
  - d) the price must be above equilibrium
- 13) A positive cross elasticity of demand coefficient indicates that:
- a) a product is an inferior good
  - b) a product is a normal good
  - c) two products are substitute goods
  - d) two products are complementary goods
- 14) Total revenue falls as the price of a good increases if price elasticity of demand is:
- a) Elastic
  - b) Inelastic
  - c) unitary elastic
  - d) perfectly elastic

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**Set Q**

**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- 1) Explain scope of managerial economics for business decision.
- 2) Explain the following terms
  - a) Microeconomics
  - b) Macroeconomics
- 3) State & explain the law of demand and law of supply.
- 4) Explain the concept of price ceilings and price floors.
- 5) Describe price elasticity of demand in detail.
- 6) Explain the concept income elasticity of demand.

**Q.3 Solve Any Two** **12**

- 1) Explain economics contribution to managerial decision.
- 2) State and explain the determinants of demand.
- 3) Explain elasticity of supply. Also state the factors affecting the elasticity of supply.

**Section – II**

**Q.4 Solve Any Four** **16**

- 1) Explain barometric method for demand forecasting.
- 2) State and explain the applications of linear programming techniques.
- 3) Describe breakeven analysis. Also state the limitations of breakeven analysis.
- 4) Explain the concept profit margin of safety.
- 5) What is market? Explain the various types of market.
- 6) State and explain the characteristics of market structure.

**Q.5 Solve Any Two** **12**

- 1) Explain trend projection method for demand forecasting.
- 2) Explain pricing decision and monopoly power in detail.
- 3) Explain following costs of production:
  - a) Fixed and Variable Costs
  - b) Total, Average, and Marginal Costs
  - c) Short-Run and Long-Run Costs

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Implicit costs are:
  - a) equal to total fixed costs.
  - b) comprised entirely of variable costs.
  - c) "payments" for self-employed resources.
  - d) always greater in the short run than in the long run.
- 2) Which of the following costs are expenses that change in proportion to the activity of a business?
 

|                  |                  |
|------------------|------------------|
| a) Variable cost | b) Fixed cost    |
| c) Material cost | d) All the above |
- 3) Under which of the following forms of market structure does a firm has no control over the price of its product?
 

|                             |                        |
|-----------------------------|------------------------|
| a) Monopoly                 | b) Oligopoly           |
| c) Monopolistic competition | d) Perfect competition |
- 4) In perfect competition, a firm maximizes profit in the short run by deciding
  - a) how much output to produce
  - b) whether or not to enter a market
  - c) what price to charge
  - d) how much capital to use
- 5) Which of the following areas of economic theory is the single most important element of managerial economics?
 

|                           |                   |
|---------------------------|-------------------|
| a) Mathematical economics | b) Econometrics   |
| c) Macroeconomics         | d) Microeconomics |
- 6) Which of the following is defined as the study of the aggregate economy studied as a whole?
 

|                           |                   |
|---------------------------|-------------------|
| a) Mathematical economics | b) Econometrics   |
| c) Macroeconomics         | d) Microeconomics |

- 7) "Capitalism" refers to:
- a) the use of markets
  - b) government ownership of capital goods
  - c) private ownership of capital goods
  - d) private ownership of homes & cars
- 8) What will happen in the rice market if buyers are expecting higher prices in the near future?
- a) The demand for rice will increase.
  - b) The demand for rice will decrease.
  - c) The demand for rice will be unaffected.
  - d) The supply of rice will increase.
- 9) When there is a shortage in a market
- a) there is downward pressure on price
  - b) there is upward pressure on price
  - c) the market could still be in equilibrium
  - d) the price must be above equilibrium
- 10) A positive cross elasticity of demand coefficient indicates that:
- a) a product is an inferior good
  - b) a product is a normal good
  - c) two products are substitute goods
  - d) two products are complementary goods
- 11) Total revenue falls as the price of a good increases if price elasticity of demand is:
- a) Elastic
  - b) Inelastic
  - c) unitary elastic
  - d) perfectly elastic
- 12) Which of the following is not a qualitative forecasting technique?
- a) Surveys of consumer expenditure plans
  - b) Perspectives of foreign advisory councils
  - c) Consumer intention polling
  - d) Time-series analysis
- 13) The best use of linear programming is to find optimal use of
- a) Money
  - b) Manpower
  - c) Machine
  - d) All of the above
- 14) Theory of production includes:
- a) Manufacturing
  - b) Packaging
  - c) Storing
  - d) All of these

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**Set R**

**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- 1) Explain scope of managerial economics for business decision.
- 2) Explain the following terms
  - a) Microeconomics
  - b) Macroeconomics
- 3) State & explain the law of demand and law of supply.
- 4) Explain the concept of price ceilings and price floors.
- 5) Describe price elasticity of demand in detail.
- 6) Explain the concept income elasticity of demand.

**Q.3 Solve Any Two** **12**

- 1) Explain economics contribution to managerial decision.
- 2) State and explain the determinants of demand.
- 3) Explain elasticity of supply. Also state the factors affecting the elasticity of supply.

**Section – II**

**Q.4 Solve Any Four** **16**

- 1) Explain barometric method for demand forecasting.
- 2) State and explain the applications of linear programming techniques.
- 3) Describe breakeven analysis. Also state the limitations of breakeven analysis.
- 4) Explain the concept profit margin of safety.
- 5) What is market? Explain the various types of market.
- 6) State and explain the characteristics of market structure.

**Q.5 Solve Any Two** **12**

- 1) Explain trend projection method for demand forecasting.
- 2) Explain pricing decision and monopoly power in detail.
- 3) Explain following costs of production:
  - a) Fixed and Variable Costs
  - b) Total, Average, and Marginal Costs
  - c) Short-Run and Long-Run Costs

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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) A positive cross elasticity of demand coefficient indicates that:
  - a) a product is an inferior good
  - b) a product is a normal good
  - c) two products are substitute goods
  - d) two products are complementary goods
- 2) Total revenue falls as the price of a good increases if price elasticity of demand is:
  - a) Elastic
  - b) Inelastic
  - c) unitary elastic
  - d) perfectly elastic
- 3) Which of the following is not a qualitative forecasting technique?
  - a) Surveys of consumer expenditure plans
  - b) Perspectives of foreign advisory councils
  - c) Consumer intention polling
  - d) Time-series analysis
- 4) The best use of linear programming is to find optimal use of
  - a) Money
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  - c) Machine
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- 5) Theory of production includes:
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  - c) Storing
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  - a) Variable cost
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  - d) All the above

- 8) Under which of the following forms of market structure does a firm has no control over the price of its product?
- a) Monopoly
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  - c) Monopolistic competition
  - d) Perfect competition
- 9) In perfect competition, a firm maximizes profit in the short run by deciding
- a) how much output to produce
  - b) whether or not to enter a market
  - c) what price to charge
  - d) how much capital to use
- 10) Which of the following areas of economic theory is the single most important element of managerial economics?
- a) Mathematical economics
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  - c) Macroeconomics
  - d) Microeconomics
- 11) Which of the following is defined as the study of the aggregate economy studied as a whole?
- a) Mathematical economics
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- 13) What will happen in the rice market if buyers are expecting higher prices in the near future?
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**T.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Managerial Economics**

Day & Date: Thursday, 09-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- 1) Explain scope of managerial economics for business decision.
- 2) Explain the following terms
  - a) Microeconomics
  - b) Macroeconomics
- 3) State & explain the law of demand and law of supply.
- 4) Explain the concept of price ceilings and price floors.
- 5) Describe price elasticity of demand in detail.
- 6) Explain the concept income elasticity of demand.

**Q.3 Solve Any Two** **12**

- 1) Explain economics contribution to managerial decision.
- 2) State and explain the determinants of demand.
- 3) Explain elasticity of supply. Also state the factors affecting the elasticity of supply.

**Section – II**

**Q.4 Solve Any Four** **16**

- 1) Explain barometric method for demand forecasting.
- 2) State and explain the applications of linear programming techniques.
- 3) Describe breakeven analysis. Also state the limitations of breakeven analysis.
- 4) Explain the concept profit margin of safety.
- 5) What is market? Explain the various types of market.
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**Q.5 Solve Any Two** **12**

- 1) Explain trend projection method for demand forecasting.
- 2) Explain pricing decision and monopoly power in detail.
- 3) Explain following costs of production:
  - a) Fixed and Variable Costs
  - b) Total, Average, and Marginal Costs
  - c) Short-Run and Long-Run Costs



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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
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| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

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|------------------------------------------------------------------------------------------|---------------|
| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
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- 4) Which one of the following is the objective of the RBI?
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  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

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| <b>Set Q</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |                                                                                          |               |
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| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 2) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 3) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 5) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 6) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 7) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

- 8) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
- a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 9) Variable factor means those factors of production \_\_\_\_\_.  
a) which can be only changed in the long run  
b) which can be changed in the short run  
c) which can be never be changed  
d) All of the above
- 10) Which one of the following is not the function of money?  
a) Medium of exchange  
b) Measure of Happiness  
c) Standard of deferred payment  
d) Store of value



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| <b>Set</b> | <b>R</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |                                                                                          |               |
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| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 2) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 4) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 5) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 6) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 8) Which one of the following cost can never become zero?
- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-361**

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4** Discuss the features of new economic policy in India. **10**
- Q.5** Explain the properties of perfect and imperfectly competitive market. **10**
- Q.6** Define national income. Explain the methods of measuring national income. **10**
- Q.7** Define central bank, discuss the function of central banking in India. **10**

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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850

- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- |              |               |
|--------------|---------------|
| a) Copyright | b) Patents    |
| c) Contracts | d) Trademarks |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the subject matter of a patent?
 

|          |              |
|----------|--------------|
| a) Art   | b) Invention |
| c) Goods | d) Ideas     |
- 2) What is copyright meant for?
 

|              |                 |
|--------------|-----------------|
| a) Film work | b) Books        |
| c) Essay     | d) All of these |
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

|                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

|         |         |
|---------|---------|
| a) 1856 | b) 1880 |
| c) 1905 | d) 1850 |
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

|              |               |
|--------------|---------------|
| a) Copyright | b) Patents    |
| c) Contracts | d) Trademarks |
- 6) Which is not a type of intellectual property?
 

|                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 7) In which article is intellectual property rights outlined?
 

|               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |
- 8) How long does intellectual property last? (after the death of the author)
 

|           |           |
|-----------|-----------|
| a) 10 yrs | b) 30 yrs |
| c) 60 yrs | d) 70 yrs |
- 9) Which of the following can you copyright?
 

|                       |            |
|-----------------------|------------|
| a) Literary work      | b) Ideas   |
| c) Choreographic work | d) Fashion |



- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

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| <b>Set</b> | <b>Q</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- |                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |

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**Set R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Set **S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two)** **20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four)** **20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works



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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who is the father of Indology?
 

|                 |              |
|-----------------|--------------|
| a) August Comte | b) Srinivas  |
| c) Ghurye       | d) Aristotle |
- 2) What is culture?
 

|                 |                |
|-----------------|----------------|
| a) literature   | b) way of life |
| c) food rituals | d) fashions    |
- 3) What is social norm?
 

|                       |                |
|-----------------------|----------------|
| a) social conventions | b) social laws |
| c) dos and don'ts     | d) governance  |
- 4) What is demography?
 

|                          |                       |
|--------------------------|-----------------------|
| a) science of society    | b) study of migration |
| c) science of population | d) study of races     |
- 5) Which of the following is applicable to tribal community?
 

|             |                |
|-------------|----------------|
| a) Religion | b) Culture     |
| c) Songs    | d) Homogeneity |
- 6) Who was the leader of the Narmada bachao movement?
 

|                  |                 |
|------------------|-----------------|
| a) Anna Hajare   | b) Medha Patkar |
| c) H.N. Bahuguna | d) Kejriwal     |
- 7) Who is the founder of Satyashodhak samaj?
 

|                 |                     |
|-----------------|---------------------|
| a) Vinoba Bhave | b) Mahatma Phule    |
| c) M. Gandhi    | d) Rajaram Mohanroy |
- 8) Which is distinctive nature of family?
 

|                   |                    |
|-------------------|--------------------|
| a) Small family   | b) Large family    |
| c) Bilateral unit | d) Unilateral unit |
- 9) What is the percentage of potable water on the earth?
 

|       |       |
|-------|-------|
| a) 2% | b) 3% |
| c) 5% | d) 7% |
- 10) Which of the following is the reformist movement?
 

|                       |                             |
|-----------------------|-----------------------------|
| a) Chipko movement    | b) Non-cooperation movement |
| c) Anti-Sati movement | d) Freedom movement         |

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| <b>Set</b> | <b>P</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 2) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 3) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit
- 4) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 5) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 6) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 7) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 8) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 9) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 10) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**

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T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022

**ELECTRICAL ENGINEERING****Introduction to Sociology**

Day &amp; Date: Monday 20-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the percentage of potable water on the earth?
  - a) 2%
  - b) 3%
  - c) 5%
  - d) 7%
- 2) Which of the following is the reformist movement?
  - a) Chipko movement
  - b) Non-cooperation movement
  - c) Anti-Sati movement
  - d) Freedom movement
- 3) Who is the father of Indology?
  - a) August Comte
  - b) Srinivas
  - c) Ghurye
  - d) Aristotle
- 4) What is culture?
  - a) literature
  - b) way of life
  - c) food rituals
  - d) fashions
- 5) What is social norm?
  - a) social conventions
  - b) social laws
  - c) dos and don'ts
  - d) governance
- 6) What is demography?
  - a) science of society
  - b) study of migration
  - c) science of population
  - d) study of races
- 7) Which of the following is applicable to tribal community?
  - a) Religion
  - b) Culture
  - c) Songs
  - d) Homogeneity
- 8) Who was the leader of the Narmada bachao movement?
  - a) Anna Hajare
  - b) Medha Patkar
  - c) H.N. Bahuguna
  - d) Kejriwal
- 9) Who is the founder of Satyashodhak samaj?
  - a) Vinoba Bhave
  - b) Mahatma Phule
  - c) M. Gandhi
  - d) Rajaram Mohanroy
- 10) Which is distinctive nature of family?
  - a) Small family
  - b) Large family
  - c) Bilateral unit
  - d) Unilateral unit

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four)** **16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society.** **12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation.** **12**

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) What is social norm?
 

|                       |                |
|-----------------------|----------------|
| a) social conventions | b) social laws |
| c) dos and don'ts     | d) governance  |
- 2) What is demography?
 

|                          |                       |
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| a) science of society    | b) study of migration |
| c) science of population | d) study of races     |
- 3) Which of the following is applicable to tribal community?
 

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| a) Religion | b) Culture     |
| c) Songs    | d) Homogeneity |
- 4) Who was the leader of the Narmada bachao movement?
 

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| a) Anna Hajare   | b) Medha Patkar |
| c) H.N. Bahuguna | d) Kejriwal     |
- 5) Who is the founder of Satyashodhak samaj?
 

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| a) Vinoba Bhave | b) Mahatma Phule    |
| c) M. Gandhi    | d) Rajaram Mohanroy |
- 6) Which is distinctive nature of family?
 

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| a) Small family   | b) Large family    |
| c) Bilateral unit | d) Unilateral unit |
- 7) What is the percentage of potable water on the earth?
 

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| a) 2% | b) 3% |
| c) 5% | d) 7% |
- 8) Which of the following is the reformist movement?
 

|                       |                             |
|-----------------------|-----------------------------|
| a) Chipko movement    | b) Non-cooperation movement |
| c) Anti-Sati movement | d) Freedom movement         |
- 9) Who is the father of Indology?
 

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| a) August Comte | b) Srinivas  |
| c) Ghurye       | d) Aristotle |
- 10) What is culture?
 

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| a) literature   | b) way of life |
| c) food rituals | d) fashions    |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRICAL ENGINEERING**  
**Introduction to Sociology**

Day & Date: Monday 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following. (Any Four) 16**
- a) Explain nature and types of status.
  - b) What demographic changes are observed in Indian population?
  - c) Explain the meaning and features of socialization.
  - d) Write on meaning and nature of Modernization.
  - e) What is the radical movement?
  - f) What are bases of a community?
- Q.3 a) Explain the meaning and characteristics of human society. 12**
- OR**
- b) What are the major trends in urbanization in developing countries?**
- Q.4 Explain the causes and consequences of environmental degradation. 12**



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Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

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- Page 1 of 12

- 10)** \_\_\_\_\_ is referred as a stressful event.
- |                 |             |
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| a) Birthday     | b) Studying |
| c) Spouse death | d) Vacation |

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

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| <b>Q.2</b> Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> Define Stress & explain current and historical status of stress. | <b>10</b> |

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Max. Marks: 50

Marks: 10

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- Page 4 of 12

- 10)** The following are the characteristics of Positive Stress.
- |                            |                      |
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| a) It improves performance | b) It feels exciting |
| c) It motivates            | d) All of the above  |

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Stress and Coping**

Day & Date: Monday, 20-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |                                                                  |           |
|------------|------------------------------------------------------------------|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) A good way to prevent stress is \_\_\_\_\_.  
 a) Drinking beverages high in caffeine  
 b) Sitting ideal doing nothing  
 c) Overeating  
 d) Taking time out for relaxation
- 2) \_\_\_\_\_ is referred as a stressful event.  
 a) Birthday  
 b) Studying  
 c) Spouse death  
 d) Vacation
- 3) Anxiety can cause the following moods \_\_\_\_\_.  
 a) Irritable  
 b) Nervous  
 c) Anxious  
 d) All of the above
- 4) \_\_\_\_\_ is the confusion about the expectation of the role one occupies.  
 a) Role stagnation  
 b) Role Isolation  
 c) Role erosion  
 d) Role ambiguity
- 5) Stress is \_\_\_\_\_ related to performance.  
 a) Positively  
 b) Negatively  
 c) Proportionately  
 d) None of these
- 6) Which one is not considered as Environmental stressors?  
 a) Weather  
 b) Traffic  
 c) Financial problems  
 d) Substandard housing
- 7) The following are the characteristics of Positive Stress.  
 a) It improves performance  
 b) It feels exciting  
 c) It motivates  
 d) All of the above
- 8) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.  
 a) Draw tight  
 b) Stimulus  
 c) Force  
 d) Attitude
- 9) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.  
 a) Medical  
 b) Psychological  
 c) Behavioral  
 d) None of these

- 10)** When a task appears overwhelming, it is best to \_\_\_\_.
- a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task



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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

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| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) Stress is \_\_\_\_\_ related to performance.
  - a) Positively
  - b) Negatively
  - c) Proportionately
  - d) None of these
- 2) Which one is not considered as Environmental stressors?
  - a) Weather
  - b) Traffic
  - c) Financial problems
  - d) Substandard housing
- 3) The following are the characteristics of Positive Stress.
  - a) It improves performance
  - b) It feels exciting
  - c) It motivates
  - d) All of the above
- 4) The word Stress is derived from Latin word 'Stringere' which means \_\_\_\_\_.
  - a) Draw tight
  - b) Stimulus
  - c) Force
  - d) Attitude
- 5) Absenteeism, turnover and less productivity are \_\_\_\_\_ symptoms of stress.
  - a) Medical
  - b) Psychological
  - c) Behavioral
  - d) None of these
- 6) When a task appears overwhelming, it is best to \_\_\_\_\_.
  - a) Put it aside till later
  - b) Drink alcohol to relax
  - c) Break it down into smaller task
  - d) Avoid the task
- 7) A good way to prevent stress is \_\_\_\_\_.
  - a) Drinking beverages high in caffeine
  - b) Sitting ideal doing nothing
  - c) Overeating
  - d) Taking time out for relaxation
- 8) \_\_\_\_\_ is referred as a stressful event.
  - a) Birthday
  - b) Studying
  - c) Spouse death
  - d) Vacation
- 9) Anxiety can cause the following moods \_\_\_\_\_.
  - a) Irritable
  - b) Nervous
  - c) Anxious
  - d) All of the above

- 10)** \_\_\_\_\_ is the confusion about the expectation of the role one occupies.
- |                    |                   |
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| a) Role stagnation | b) Role Isolation |
| c) Role erosion    | d) Role ambiguity |

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**T.Y (B.Tech.) (Sem-I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Stress and Coping**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any 4 Questions from Q.No.2 to Q.No.7.  
2) Figures to the right indicate full marks.

- |            |                                                                  |           |
|------------|------------------------------------------------------------------|-----------|
| <b>Q.2</b> | Explain the role of social support in mitigating stress.         | <b>10</b> |
| <b>Q.3</b> | Explain various sources of stress in detail.                     | <b>10</b> |
| <b>Q.4</b> | Explain various consequences due to stress.                      | <b>10</b> |
| <b>Q.5</b> | Stress can be managed explain various techniques.                | <b>10</b> |
| <b>Q.6</b> | Discuss the nature of stress response.                           | <b>10</b> |
| <b>Q.7</b> | Define Stress & explain current and historical status of stress. | <b>10</b> |

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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks:10

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- Page 1 of 12

- 9) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
- a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 10) Belief that the privacy of others must always be maintained \_\_\_\_\_.
- a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Courage is the tendency to accept and face \_\_\_\_\_.  
 a) Self-confidence  
 b) Risks and difficult tasks in rational ways  
 c) Physical courage  
 d) Social courage
- 2) Commitment means \_\_\_\_\_.  
 a) Alignment to goals  
 b) Adherence to ethical principles  
 c) Empathy  
 d) All the above
- 3) The objectives of professional ethics in engineering are  
 a) To understand the moral values that ought to guide the Engineering profession  
 b) To resolve the moral issues in the profession, and  
 c) To justify the moral judgment concerning the profession  
 d) All the above
- 4) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.  
 a) Integrity  
 b) Work ethic  
 c) Personal Values  
 d) Professional values
- 5) Belief that the privacy of others must always be maintained \_\_\_\_\_.  
 a) Confidentiality  
 b) Empathy  
 c) Ethics  
 d) Work ethics
- 6) Ethics has evolved with evaluation of \_\_\_\_\_.  
 a) Culture  
 b) Value  
 c) Society  
 d) Moral
- 7) Virtues are \_\_\_\_\_.  
 a) Moral  
 b) Ethics  
 c) Values  
 d) Positive and preferred values
- 8) Honestly is a \_\_\_\_\_.  
 a) Virtue  
 b) Truthfulness  
 c) Trustworthiness  
 d) Communication



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| <b>Set</b> | <b>Q</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

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Set **R**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 2) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics
- 3) Ethics has evolved with evaluation of \_\_\_\_\_.
  - a) Culture
  - b) Value
  - c) Society
  - d) Moral
- 4) Virtues are \_\_\_\_\_.
  - a) Moral
  - b) Ethics
  - c) Values
  - d) Positive and preferred values
- 5) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 6) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 7) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 8) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 9) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above

- 10)** The objectives of professional ethics in engineering are
- a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4** **Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Honestly is a \_\_\_\_\_.
  - a) Virtue
  - b) Truthfulness
  - c) Trustworthiness
  - d) Communication
- 2) Human life is lived at four levels individuals, family, society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money
- 4) Courage is the tendency to accept and face \_\_\_\_\_.
  - a) Self-confidence
  - b) Risks and difficult tasks in rational ways
  - c) Physical courage
  - d) Social courage
- 5) Commitment means \_\_\_\_\_.
  - a) Alignment to goals
  - b) Adherence to ethical principles
  - c) Empathy
  - d) All the above
- 6) The objectives of professional ethics in engineering are
  - a) To understand the moral values that ought to guide the Engineering profession
  - b) To resolve the moral issues in the profession, and
  - c) To justify the moral judgment concerning the profession
  - d) All the above
- 7) \_\_\_\_\_ is defined as a set of attitudes concerned with the values of work, which forms the motivational orientation.
  - a) Integrity
  - b) Work ethic
  - c) Personal Values
  - d) Professional values
- 8) Belief that the privacy of others must always be maintained \_\_\_\_\_.
  - a) Confidentiality
  - b) Empathy
  - c) Ethics
  - d) Work ethics

- a) Culture
- c) Society

- b) Value  
d) Moral

- a) Moral  
c) Values

- b) Ethics
- d) Positive and preferred values

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Professional Ethics & Human Value**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2** List the human values and explain any two in detail. **10**  
**OR**  
Distinguish between Kohlberg's and Gilligan's approach to ethical (moral) judgments.
- Q.3** Discuss in detail risk benefit analysis and reducing risk. **10**  
**OR**  
Explain the role of engineers as manager.
- Q.4 Write short notes on any four** **20**  
a) Objectives of Engineering Ethics  
b) Self confidence  
c) Commitment  
d) Difference between moral and ethics  
e) Intellectual property rights  
f) Code of ethics



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**T.Y.(B.Tech) (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRIC ENGINEERING**  
**Electrical Machine Design**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Which of the following could be lamina-proximately the thickness of laminations of D.C. machine?
 

|              |            |
|--------------|------------|
| a) 0.0005 mm | b) 0.05 mm |
| c) 0.5 mm    | d) 5 mm    |
- 2) The commutators segments are connected to the armature conductors by means of
 

|                    |                     |
|--------------------|---------------------|
| a) Copper lugs     | b) Resistance wires |
| c) Insulation pads | d) Brazing          |
- 3) A separately excited generator as compared to a self-excited generator
 

|                                                     |
|-----------------------------------------------------|
| a) is amenable to better voltage control            |
| b) is more stable                                   |
| c) has exciting current independent of load current |
| d) has all above features                           |
- 4) The permissible flux density in case of cold rolled grain oriented steel is around
 

|                          |                          |
|--------------------------|--------------------------|
| a) 1.7 Wb/m <sup>2</sup> | b) 2.7 Wb/m <sup>2</sup> |
| c) 3.7 Wb/m <sup>2</sup> | d) 4.7 Wb/m <sup>2</sup> |
- 5) The condition for a transformer to be designed for the minimum volume is
 

|                                      |
|--------------------------------------|
| a) Iron loss = copper loss           |
| b) Volume of iron = volume of copper |
| c) Weight of iron = weight of copper |
| d) The volume of iron is minimum     |
- 6) No-load current in a large sized transformer is about
 

|                             |                            |
|-----------------------------|----------------------------|
| a) 10% of full-load current | b) 7% of full-load current |
| c) 4% of full-load current  | d) 1% of full load current |
- 7) Transformer breaths in when
 

|                          |                         |
|--------------------------|-------------------------|
| a) Load on it increases  | b) Load on it decreases |
| c) Load remains constant | d) None of the above    |

- 8) In a dc machines "contraction coefficient" is used to take into account the reduction of
- a) Air-gap area due to armature slots
  - b) Iron losses in the teeth due to lower tooth density
  - c) Armature mmf due to armature slots
  - d) Torque due to ventilating duct
- 9) A lap wound dc machines has 400 conductor and 8 poles. The voltage induced per conductor is 2 volts. The machines generates a voltage of
- a) 100 V
  - b) 200 V
  - c) 400 V
  - d) 800 V
- 10) If the stator winding of a 3 phase induction motor is delta connected, the rotor winding
- a) Should be delta connected
  - b) Should be star connected
  - c) Should not be delta connected
  - d) May be star or delta connected
- 11) When 3 phase induction motor is designed with higher value of  $B_{av}$  it will give
- a) Better full load power factor
  - b) A higher starting torque
  - c) Higher full load efficiency
  - d) Higher overload capacity
- 12) In squirrel cage induction motors, the rotor slots are usually given slight skew in order to
- a) reduce windage losses
  - b) reduce eddy currents
  - c) reduce accumulation of dirt and dust
  - d) reduce magnetic hum
- 13) In turbo-alternator the rotor diameter is limited to about 1.2 m due to
- a) Centrifugal forces
  - b) Deflection
  - c) Critical speed
  - d) All of the above
- 14) Multiple inlet system of air cooling of turbo-alternator can be employed for machine of rating up to
- a) 20 MW
  - b) 100 MW
  - c) 60 MW
  - d) 250 MW

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**T.Y.(B.Tech) (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022**

**ELECTRIC ENGINEERING**

**Electrical Machine Design**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any Four questions.**

**16**

- Explain the principles of machines.
- Explain the difference between the core & shell type transformer.
- Explain the separation of D&L of dc machine.
- A 350KW, 500V, 450RPM 6 pole dc generator is built with an armature diameter of 0.87m and core length of 0.32m the lap wound armature has 660 conductors. Calculate the specific electric & magnetic loadings
- The ratio and flux to full load mmf in a 400 KVA, 50 Hz, 1 phase core type power transformer is  $2.4 \times 10^{-6}$ , calculate the net iron area and the window area of the transformer. max. flux density in the core is  $1.3 \text{ wb/m}^2$ , current density  $2.7 \text{ A/mm}^2$  and window space factor 0.26. also, calculate the full load mmf.

**Q.3 Attempt any Two of the following**

**12**

- Derive an expression for output equation-EMF/tum of winding.
- Derive an expression for core length for dc machine.
- Estimate the main dimensions including winding conductor area of a 3-ph. Delta-star core type transformer rated at 300kva, 6600/440v, 0Hz a suitable core with 3 steps having a circumscribing circle of 0.2m diameter and leg spacing of 0.4m is available  $\text{emf/tum} = 8.5\text{v}$ , current density  $= 2.5 \text{ A/mm}^2$   
 $K_w = 0.28$ ,  $S_f = 0.9$

**Section – II**

**Q.4 Attempt Any Four of the following.**

**16**

- Explain the specific loadings for induction machine.
- Explain factors affecting the size of rotating machines.
- Derive the separation of D&L for induction machine.
- The output coefficient of 1250kva, 300rpm synchronous generator is  $200 \text{ kva/m-rps}$   $L/D = 0.2$  find the values of main dimensions.
- A 20hp, 440v, 4pole 50hz, 3ph. Induction machine is built with a stator diameter of 0.25m core length of 0.16m the specific electric loading is 23000 amp. Cond. find the specific magnetic loading.

**Q.5 Attempt Any Two of the following**

- a)** Derive an expression for length of the air gap for synchronous machine.
- b)** Derive an expression for design of end rings of induction machine.
- c)** Calculate the specific electric and magnetic loading of 100hp, 300v, 3-ph. 50hz, 8pole, star connected IM having stator core length = 0.5m and diameter = 0.66m turns/ph. = 286 assume full load efficiency = 0.938 & p.f = 0.86

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**T.Y.(B.Tech) (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRIC ENGINEERING**  
**Electrical Machine Design**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) In a dc machines "contraction coefficient" is used to take into account the reduction of
  - a) Air-gap area due to armature slots
  - b) Iron losses in the teeth due to lower tooth density
  - c) Armature mmf due to armature slots
  - d) Torque due to ventilating duct
- 2) A lap wound dc machines has 400 conductor and 8 poles. The voltage induced per conductor is 2 volts. The machines generates a voltage of
  - a) 100 V
  - b) 200 V
  - c) 400 V
  - d) 800 V
- 3) If the stator winding of a 3 phase induction motor is delta connected, the rotor winding
  - a) Should be delta connected
  - b) Should be star connected
  - c) Should not be delta connected
  - d) May be star or delta connected
- 4) When 3 phase induction motor is designed with higher value of  $B_{av}$  it will give
  - a) Better full load power factor
  - b) A higher starting torque
  - c) Higher full load efficiency
  - d) Higher overload capacity
- 5) In squirrel cage induction motors, the rotor slots are usually given slight skew in order to
  - a) reduce windage losses
  - b) reduce eddy currents
  - c) reduce accumulation of dirt and dust
  - d) reduce magnetic hum
- 6) In turbo-alternator the rotor diameter is limited to about 1.2 m due to
  - a) Centrifugal forces
  - b) Deflection
  - c) Critical speed
  - d) All of the above

- 7) Multiple inlet system of air cooling of turbo-alternator can be employed for machine of rating up to
- a) 20 MW
  - b) 100 MW
  - c) 60 MW
  - d) 250 MW
- 8) Which of the following could be lamina-proximately the thickness of laminations of D.C. machine?
- a) 0.0005 mm
  - b) 0.05 mm
  - c) 0.5 mm
  - d) 5 mm
- 9) The commutators segments are connected to the armature conductors by means of
- a) Copper lugs
  - b) Resistance wires
  - c) Insulation pads
  - d) Brazing
- 10) A separately excited generator as compared to a self-excited generator
- a) is amenable to better voltage control
  - b) is more stable
  - c) has exciting current independent of load current
  - d) has all above features
- 11) The permissible flux density in case of cold rolled grain oriented steel is around
- a) 1.7 Wb/m<sup>2</sup>
  - b) 2.7 Wb/m<sup>2</sup>
  - c) 3.7 Wb/m<sup>2</sup>
  - d) 4.7 Wb/m<sup>2</sup>
- 12) The condition for a transformer to be designed for the minimum volume is
- a) Iron loss = copper loss
  - b) Volume of iron = volume of copper
  - c) Weight of iron = weight of copper
  - d) The volume of iron is minimum
- 13) No-load current in a large sized transformer is about
- a) 10% of full-load current
  - b) 7% of full-load current
  - c) 4% of full-load current
  - d) 1% of full load current
- 14) Transformer breaths in when
- a) Load on it increases
  - b) Load on it decreases
  - c) Load remains constant
  - d) None of the above

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Set **Q**

T.Y.(B.Tech) (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022

**ELECTRIC ENGINEERING****Electrical Machine Design**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I****Q.2 Answer any Four questions.****16**

- Explain the principles of machines.
- Explain the difference between the core & shell type transformer.
- Explain the separation of D&L of dc machine.
- A 350KW, 500V, 450RPM 6 pole dc generator is built with an armature diameter of 0.87m and core length of 0.32m the lap wound armature has 660 conductors. Calculate the specific electric & magnetic loadings
- The ratio and flux to full load mmf in a 400 KVA, 50 Hz, 1 phase core type power transformer is  $2.4 \times 10^{-6}$ , calculate the net iron area and the window area of the transformer. max. flux density in the core is  $1.3 \text{ wb/m}^2$ , current density  $2.7 \text{ A/mm}^2$  and window space factor 0.26. also, calculate the full load mmf.

**Q.3 Attempt any Two of the following****12**

- Derive an expression for output equation-EMF/tum of winding.
- Derive an expression for core length for dc machine.
- Estimate the main dimensions including winding conductor area of a 3-ph. Delta-star core type transformer rated at 300kva, 6600/440v, 0Hz a suitable core with 3 steps having a circumscribing circle of 0.2m diameter and leg spacing of 0.4m is available  $\text{emf/tum} = 8.5 \text{ v}$ , current density  $= 2.5 \text{ A/mm}^2$   
 $K_w = 0.28$ ,  $S_f = 0.9$

**Section – II****Q.4 Attempt Any Four of the following.****16**

- Explain the specific loadings for induction machine.
- Explain factors affecting the size of rotating machines.
- Derive the separation of D&L for induction machine.
- The output coefficient of 1250kva, 300rpm synchronous generator is  $200 \text{ kva/m-rps}$   $L/D = 0.2$  find the values of main dimensions.
- A 20hp, 440v, 4pole 50hz, 3ph. Induction machine is built with a stator diameter of 0.25m core length of 0.16m the specific electric loading is 23000 amp. Cond. find the specific magnetic loading.

**Q.5 Attempt Any Two of the following**

- a)** Derive an expression for length of the air gap for synchronous machine.
- b)** Derive an expression for design of end rings of induction machine.
- c)** Calculate the specific electric and magnetic loading of 100hp, 300v, 3-ph. 50hz, 8pole, star connected IM having stator core length = 0.5m and diameter = 0.66m turns/ph. = 286 assume full load efficiency = 0.938 & p.f = 0.86



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**T.Y.(B.Tech) (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRIC ENGINEERING**  
**Electrical Machine Design**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) When 3 phase induction motor is designed with higher value of  $B_{av}$  it will give
  - a) Better full load power factor
  - b) A higher starting torque
  - c) Higher full load efficiency
  - d) Higher overload capacity
- 2) In squirrel cage induction motors, the rotor slots are usually given slight skew in order to
  - a) reduce windage losses
  - b) reduce eddy currents
  - c) reduce accumulation of dirt and dust
  - d) reduce magnetic hum
- 3) In turbo-alternator the rotor diameter is limited to about 1.2 m due to
 

|                       |                     |
|-----------------------|---------------------|
| a) Centrifugal forces | b) Deflection       |
| c) Critical speed     | d) All of the above |
- 4) Multiple inlet system of air cooling of turbo-alternator can be employed for machine of rating up to
 

|          |           |
|----------|-----------|
| a) 20 MW | b) 100 MW |
| c) 60 MW | d) 250 MW |
- 5) Which of the following could be lamina-proximately the thickness of laminations of D.C. machine?
 

|              |            |
|--------------|------------|
| a) 0.0005 mm | b) 0.05 mm |
| c) 0.5 mm    | d) 5 mm    |
- 6) The commutators segments are connected to the armature conductors by means of
 

|                    |                     |
|--------------------|---------------------|
| a) Copper lugs     | b) Resistance wires |
| c) Insulation pads | d) Brazing          |

- 7) A separately excited generator as compared to a self-excited generator
- a) is amenable to better voltage control
  - b) is more stable
  - c) has exciting current independent of load current
  - d) has all above features
- 8) The permissible flux density in case of cold rolled grain oriented steel is around
- a) 1.7 Wb/m<sup>2</sup>
  - b) 2.7 Wb/m<sup>2</sup>
  - c) 3.7 Wb/m<sup>2</sup>
  - d) 4.7 Wb/m<sup>2</sup>
- 9) The condition for a transformer to be designed for the minimum volume is
- a) Iron loss = copper loss
  - b) Volume of iron = volume of copper
  - c) Weight of iron = weight of copper
  - d) The volume of iron is minimum
- 10) No-load current in a large sized transformer is about
- a) 10% of full-load current
  - b) 7% of full-load current
  - c) 4% of full-load current
  - d) 1% of full load current
- 11) Transformer breaths in when
- a) Load on it increases
  - b) Load on it decreases
  - c) Load remains constant
  - d) None of the above
- 12) In a dc machines "contraction coefficient" is used to take into account the reduction of
- a) Air-gap area due to armature slots
  - b) Iron losses in the teeth due to lower tooth density
  - c) Armature mmf due to armature slots
  - d) Torque due to ventilating duct
- 13) A lap wound dc machines has 400 conductor and 8 poles. The voltage induced per conductor is 2 volts. The machines generates a voltage of
- a) 100 V
  - b) 200 V
  - c) 400 V
  - d) 800 V
- 14) If the stator winding of a 3 phase induction motor is delta connected, the rotor winding
- a) Should be delta connected
  - b) Should be star connected
  - c) Should not be delta connected
  - d) May be star or delta connected

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Set **R**

T.Y.(B.Tech) (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022

**ELECTRIC ENGINEERING****Electrical Machine Design**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I****Q.2 Answer any Four questions.****16**

- Explain the principles of machines.
- Explain the difference between the core & shell type transformer.
- Explain the separation of D&L of dc machine.
- A 350KW, 500V, 450RPM 6 pole dc generator is built with an armature diameter of 0.87m and core length of 0.32m the lap wound armature has 660 conductors. Calculate the specific electric & magnetic loadings
- The ratio and flux to full load mmf in a 400 KVA, 50 Hz, 1 phase core type power transformer is  $2.4 \times 10^{-6}$ , calculate the net iron area and the window area of the transformer. max. flux density in the core is  $1.3 \text{ wb/m}^2$ , current density  $2.7 \text{ A/mm}^2$  and window space factor 0.26. also, calculate the full load mmf.

**Q.3 Attempt any Two of the following****12**

- Derive an expression for output equation-EMF/tum of winding.
- Derive an expression for core length for dc machine.
- Estimate the main dimensions including winding conductor area of a 3-ph. Delta-star core type transformer rated at 300kva, 6600/440v, 0Hz a suitable core with 3 steps having a circumscribing circle of 0.2m diameter and leg spacing of 0.4m is available  $\text{emf/tum} = 8.5 \text{ v}$ , current density  $= 2.5 \text{ A/mm}^2$   
 $K_w = 0.28$ ,  $S_f = 0.9$

**Section – II****Q.4 Attempt Any Four of the following.****16**

- Explain the specific loadings for induction machine.
- Explain factors affecting the size of rotating machines.
- Derive the separation of D&L for induction machine.
- The output coefficient of 1250kva, 300rpm synchronous generator is  $200 \text{ kva/m-rps}$   $L/D = 0.2$  find the values of main dimensions.
- A 20hp, 440v, 4pole 50hz, 3ph. Induction machine is built with a stator diameter of 0.25m core length of 0.16m the specific electric loading is 23000 amp. Cond. find the specific magnetic loading.

**Q.5 Attempt Any Two of the following**

- a)** Derive an expression for length of the air gap for synchronous machine.
- b)** Derive an expression for design of end rings of induction machine.
- c)** Calculate the specific electric and magnetic loading of 100hp, 300v, 3-ph. 50hz, 8pole, star connected IM having stator core length = 0.5m and diameter = 0.66m turns/ph. = 286 assume full load efficiency = 0.938 & p.f = 0.86

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**T.Y.(B.Tech) (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRIC ENGINEERING**  
**Electrical Machine Design**

Day & Date: Tuesday, 14-02-2023  
 Time: 10:00 AM To 1:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) No-load current in a large sized transformer is about
 

|                             |                            |
|-----------------------------|----------------------------|
| a) 10% of full-load current | b) 7% of full-load current |
| c) 4% of full-load current  | d) 1% of full load current |
- 2) Transformer breaths in when
 

|                          |                         |
|--------------------------|-------------------------|
| a) Load on it increases  | b) Load on it decreases |
| c) Load remains constant | d) None of the above    |
- 3) In a dc machines "contraction coefficient" is used to take into account the reduction of
 

|                                                        |
|--------------------------------------------------------|
| a) Air-gap area due to armature slots                  |
| b) Iron losses in the teeth due to lower tooth density |
| c) Armature mmf due to armature slots                  |
| d) Torque due to ventilating duct                      |
- 4) A lap wound dc machines has 400 conductor and 8 poles. The voltage induced per conductor is 2 volts. The machines generates a voltage of
 

|          |          |
|----------|----------|
| a) 100 V | b) 200 V |
| c) 400 V | d) 800 V |
- 5) If the stator winding of a 3 phase induction motor is delta connected, the rotor winding
 

|                                   |
|-----------------------------------|
| a) Should be delta connected      |
| b) Should be star connected       |
| c) Should not be delta connected  |
| d) May be star or delta connected |
- 6) When 3 phase induction motor is designed with higher value of  $B_{av}$  it will give
 

|                                  |
|----------------------------------|
| a) Better full load power factor |
| b) A higher starting torque      |
| c) Higher full load efficiency   |
| d) Higher overload capacity      |

- 7) In squirrel cage induction motors, the rotor slots are usually given slight skew in order to
- a) reduce windage losses
  - b) reduce eddy currents
  - c) reduce accumulation of dirt and dust
  - d) reduce magnetic hum
- 8) In turbo-alternator the rotor diameter is limited to about 1.2 m due to
- a) Centrifugal forces
  - b) Deflection
  - c) Critical speed
  - d) All of the above
- 9) Multiple inlet system of air cooling of turbo-alternator can be employed for machine of rating up to
- a) 20 MW
  - b) 100 MW
  - c) 60 MW
  - d) 250 MW
- 10) Which of the following could be lamina-proximately the thickness of laminations of D.C. machine?
- a) 0.0005 mm
  - b) 0.05 mm
  - c) 0.5 mm
  - d) 5 mm
- 11) The commutators segments are connected to the armature conductors by means of
- a) Copper lugs
  - b) Resistance wires
  - c) Insulation pads
  - d) Brazing
- 12) A separately excited generator as compared to a self-excited generator
- a) is amenable to better voltage control
  - b) is more stable
  - c) has exciting current independent of load current
  - d) has all above features
- 13) The permissible flux density in case of cold rolled grain oriented steel is around
- a) 1.7 Wb/m<sup>2</sup>
  - b) 2.7 Wb/m<sup>2</sup>
  - c) 3.7 Wb/m<sup>2</sup>
  - d) 4.7 Wb/m<sup>2</sup>
- 14) The condition for a transformer to be designed for the minimum volume is
- a) Iron loss = copper loss
  - b) Volume of iron = volume of copper
  - c) Weight of iron = weight of copper
  - d) The volume of iron is minimum

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Set **S**

T.Y.(B.Tech) (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022

**ELECTRIC ENGINEERING****Electrical Machine Design**

Day & Date: Tuesday, 14-02-2023  
Time: 10:00 AM To 1:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I****Q.2 Answer any Four questions.****16**

- Explain the principles of machines.
- Explain the difference between the core & shell type transformer.
- Explain the separation of D&L of dc machine.
- A 350KW, 500V, 450RPM 6 pole dc generator is built with an armature diameter of 0.87m and core length of 0.32m the lap wound armature has 660 conductors. Calculate the specific electric & magnetic loadings
- The ratio and flux to full load mmf in a 400 KVA, 50 Hz, 1 phase core type power transformer is  $2.4 \times 10^{-6}$ , calculate the net iron area and the window area of the transformer. max. flux density in the core is  $1.3 \text{ wb/m}^2$ , current density  $2.7 \text{ A/mm}^2$  and window space factor 0.26. also, calculate the full load mmf.

**Q.3 Attempt any Two of the following****12**

- Derive an expression for output equation-EMF/tum of winding.
- Derive an expression for core length for dc machine.
- Estimate the main dimensions including winding conductor area of a 3-ph. Delta-star core type transformer rated at 300kva, 6600/440v, 0Hz a suitable core with 3 steps having a circumscribing circle of 0.2m diameter and leg spacing of 0.4m is available  $\text{emf/tum} = 8.5 \text{ v}$ , current density  $= 2.5 \text{ A/mm}^2$   
 $K_w = 0.28$ ,  $S_f = 0.9$

**Section – II****Q.4 Attempt Any Four of the following.****16**

- Explain the specific loadings for induction machine.
- Explain factors affecting the size of rotating machines.
- Derive the separation of D&L for induction machine.
- The output coefficient of 1250kva, 300rpm synchronous generator is  $200 \text{ kva/m-rps}$   $L/D = 0.2$  find the values of main dimensions.
- A 20hp, 440v, 4pole 50hz, 3ph. Induction machine is built with a stator diameter of 0.25m core length of 0.16m the specific electric loading is 23000 amp. Cond. find the specific magnetic loading.

**Q.5 Attempt Any Two of the following**

- a)** Derive an expression for length of the air gap for synchronous machine.
- b)** Derive an expression for design of end rings of induction machine.
- c)** Calculate the specific electric and magnetic loading of 100hp, 300v, 3-ph. 50hz, 8pole, star connected IM having stator core length = 0.5m and diameter = 0.66m turns/ph. = 286 assume full load efficiency = 0.938 & p.f = 0.86



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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Utilisation**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Candela is the unit of which of the following?
  - a) Wavelength
  - b) Luminous intensity
  - c) Luminous Flux
  - d) Frequency
- 2) Desired illumination level of the working plane depends upon
  - a) Whether the object is stationary or moving
  - b) Size of the object to seen and its distance from the observer
  - c) Whether the object is to be seen for longer duration or shorter duration of time
  - d) All of above
- 3) \_\_\_\_\_ is used for heating non-conducting materials
  - a) Eddy current heating
  - b) Arc heating
  - c) Induction heating
  - d) Dielectric heating
- 4) In induction heating \_\_\_\_\_ is abnormally high.
  - a) Phase angle
  - b) Frequency
  - c) Current
  - d) Voltage
- 5) In an arc welded joint poor fusion is due to which of the following?
  - a) Improper current
  - b) High welding speed
  - c) Uncleaned metal surface
  - d) Lack of flux
- 6) Spot welding is used for \_\_\_\_\_.
  - a) Thin metal sheets
  - b) Rough and irregular surfaces
  - c) Costing only
  - d) Thick sections
- 7) \_\_\_\_\_ welding is no a resistance welding process.
  - a) Projection
  - b) Seam
  - c) Flush
  - d) Carbon arc
- 8) Which of the following is an advantage of electric traction over other method of traction?
  - a) Faster acceleration
  - b) No pollution problems
  - c) Better braking action
  - d) All of the above
- 9) Which of the following is the voltage for single phase AC system?
  - a) 22V
  - b) 440V
  - c) 5KV
  - d) 15KV

- 10)** Which of the following is the advantage of electric braking?
- a) It avoids wear of track
  - b) Motor continues to remain loaded during braking
  - c) It is instantaneous
  - d) More heat is generated during braking
- 11)** Quadrilateral speed time curve pertains to which of the following services?
- a) Main line service
  - b) Urban service
  - c) Sub-urban service
  - d) Urban and sub-urban service
- 12)** Speed time curve of main line service differs from those of urban and sub-urban services on following account
- a) It has longer free running period
  - b) It has longer coasting period
  - c) Accelerating and braking periods are comparatively smaller
  - d) All of above
- 13)** The specific energy consumption of a train depends on which of the following
- a) Acceleration and retardation
  - b) Gradient
  - c) Distance covered
  - d) All of above
- 14)** Energy consumption in propelling the train is required for which of the following?
- a) Work against the resistance to motion
  - b) Work against gravity while moving up the gradient
  - c) Acceleration
  - d) All of above

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Set **P**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Utilisation**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four questions.** **16**

- a) Describe with the help of a neat diagram the construction and working of a high pressure mercury vapour lamp.
- b) What do you understand by direct, indirect and semi-indirect lighting?
- c) Explain the method of induction heating and describe coreless type of induction furnaces.
- d) Explain with a neat sketch how the spot welding is carried out by a spot welding machine.
- e) A 250 V lamp has a total flux of 3000 lumens and takes a current of 0.8 A. Calculate
  - a) lumens/watt
  - b) M.S.C.P./watt

**Q.3 Solve any two questions.** **12**

- a) What is dielectric heating? Explain the factors on which the dielectric loss in a dielectric material depends.
- b) A hall measuring 27.5m x 45.75m is to be illuminated using 200 watt filament lamps. The luminous efficiency of the 200 watt filament lamp is 14.4 lumens/watt. Inside the hall an average illumination of 108 lumens/m<sup>2</sup> is to be provided on the working plane. The walls and ceiling are brightly painted. Take coefficient of utilization as 0.35 and depreciation factor as 0.9. Calculate the number of lamps required for this.
- c) Discuss in detail the principle of operation of (i) Ultrasonic welding and (ii) Laser welding.

**Section – II**

**Q.4 Solve any four questions.** **16**

- a) What do you mean by "Electric traction"? What are the requirements of an ideal traction system? How are they met in an electric traction system?
- b) What are the various traction systems in practice in our country? Give the advantages of electric drives with its limitations and discuss briefly the factors governing the final choice of traction system.
- c) What do you understand by speed-time curves? What is its use in practice? Explain clearly 'free running', 'coasting' and 'braking' with reference to electric traction systems.
- d) Explain speed-time curve of a train running on main line. Define 'crest speed', 'average speed' and 'schedule speed'.
- e) Derive a suitable equation to determine  $V_m$  from a simplified speed-time curve.

**Q.5 Solve any two questions.****12**

- a)** Describe the procedure of calculating the specific energy consumption of an electric train.
- b)** Write short notes on the following.
  - i) Factors affecting energy consumption in propelling a train.
  - ii) Mechanics of 'train movement'
  - iii) Dead weight, accelerating weight and adhesive weight of a train
  - iv) Tractive effort for propulsion of train
- c)** A schedule speed of 45km/h is required between two stops 1.5 km apart. Find the maximum speed over the run if the stop is of 20 second duration. The values of acceleration and retardation are 2.4 km/h/s and 3.2 km/h/s respectively. Assume a simplified trapezoidal speed time curve.

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Utilisation**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is an advantage of electric traction over other method of traction?
 

|                          |                          |
|--------------------------|--------------------------|
| a) Faster acceleration   | b) No pollution problems |
| c) Better braking action | d) All of the above      |
- 2) Which of the following is the voltage for single phase AC system?
 

|        |         |
|--------|---------|
| a) 22V | b) 440V |
| c) 5KV | d) 15KV |
- 3) Which of the following is the advantage of electric braking?
 

|                                                    |
|----------------------------------------------------|
| a) It avoids wear of track                         |
| b) Motor continues to remain loaded during braking |
| c) It is instantaneous                             |
| d) More heat is generated during braking           |
- 4) Quadrilateral speed time curve pertains to which of the following services?
 

|                      |                                |
|----------------------|--------------------------------|
| a) Main line service | b) Urban service               |
| c) Sub-urban service | d) Urban and sub-urban service |
- 5) Speed time curve of main line service differs from those of urban and sub-urban services on following account
 

|                                                               |
|---------------------------------------------------------------|
| a) It has longer free running period                          |
| b) It has longer coasting period                              |
| c) Accelerating and braking periods are comparatively smaller |
| d) All of above                                               |
- 6) The specific energy consumption of a train depends on which of the following
 

|                                 |                 |
|---------------------------------|-----------------|
| a) Acceleration and retardation | b) Gradient     |
| c) Distance covered             | d) All of above |
- 7) Energy consumption in propelling the train is required for which of the following?
 

|                                                      |
|------------------------------------------------------|
| a) Work against the resistance to motion             |
| b) Work against gravity while moving up the gradient |
| c) Acceleration                                      |
| d) All of above                                      |



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**Set Q**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Utilisation**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four questions. 16**

- a) Describe with the help of a neat diagram the construction and working of a high pressure mercury vapour lamp.
- b) What do you understand by direct, indirect and semi-indirect lighting?
- c) Explain the method of induction heating and describe coreless type of induction furnaces.
- d) Explain with a neat sketch how the spot welding is carried out by a spot welding machine.
- e) A 250 V lamp has a total flux of 3000 lumens and takes a current of 0.8 A. Calculate
  - a) lumens/watt
  - b) M.S.C.P./watt

**Q.3 Solve any two questions. 12**

- a) What is dielectric heating? Explain the factors on which the dielectric loss in a dielectric material depends.
- b) A hall measuring 27.5m x 45.75m is to be illuminated using 200 watt filament lamps. The luminous efficiency of the 200 watt filament lamp is 14.4 lumens/watt. Inside the hall an average illumination of 108 lumens/m<sup>2</sup> is to be provided on the working plane. The walls and ceiling are brightly painted. Take coefficient of utilization as 0.35 and depreciation factor as 0.9. Calculate the number of lamps required for this.
- c) Discuss in detail the principle of operation of (i) Ultrasonic welding and (ii) Laser welding.

**Section – II**

**Q.4 Solve any four questions. 16**

- a) What do you mean by "Electric traction"? What are the requirements of an ideal traction system? How are they met in an electric traction system?
- b) What are the various traction systems in practice in our country? Give the advantages of electric drives with its limitations and discuss briefly the factors governing the final choice of traction system.
- c) What do you understand by speed-time curves? What is its use in practice? Explain clearly 'free running', 'coasting' and 'braking' with reference to electric traction systems.
- d) Explain speed-time curve of a train running on main line. Define 'crest speed', 'average speed' and 'schedule speed'.
- e) Derive a suitable equation to determine  $V_m$  from a simplified speed-time curve.

**Q.5 Solve any two questions.****12**

- a)** Describe the procedure of calculating the specific energy consumption of an electric train.
- b)** Write short notes on the following.
  - i) Factors affecting energy consumption in propelling a train.
  - ii) Mechanics of 'train movement'
  - iii) Dead weight, accelerating weight and adhesive weight of a train
  - iv) Tractive effort for propulsion of train
- c)** A schedule speed of 45km/h is required between two stops 1.5 km apart. Find the maximum speed over the run if the stop is of 20 second duration. The values of acceleration and retardation are 2.4 km/h/s and 3.2 km/h/s respectively. Assume a simplified trapezoidal speed time curve.



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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Utilisation**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Quadrilateral speed time curve pertains to which of the following services?
  - a) Main line service
  - b) Urban service
  - c) Sub-urban service
  - d) Urban and sub-urban service
- 2) Speed time curve of main line service differs from those of urban and sub-urban services on following account
  - a) It has longer free running period
  - b) It has longer coasting period
  - c) Accelerating and braking periods are comparatively smaller
  - d) All of above
- 3) The specific energy consumption of a train depends on which of the following
  - a) Acceleration and retardation
  - b) Gradient
  - c) Distance covered
  - d) All of above
- 4) Energy consumption in propelling the train is required for which of the following?
  - a) Work against the resistance to motion
  - b) Work against gravity while moving up the gradient
  - c) Acceleration
  - d) All of above
- 5) Candela is the unit of which of the following?
  - a) Wavelength
  - b) Luminous intensity
  - c) Luminous Flux
  - d) Frequency
- 6) Desired illumination level of the working plane depends upon
  - a) Whether the object is stationary or moving
  - b) Size of the object to seen and its distance from the observer
  - c) Whether the object is to be seen for longer duration or shorter duration of time
  - d) All of above
- 7) \_\_\_\_\_ is used for heating non-conducting materials
  - a) Eddy current heating
  - b) Arc heating
  - c) Induction heating
  - d) Dielectric heating

- 8) In induction heating \_\_\_\_\_ is abnormally high.
  - a) Phase angle
  - b) Frequency
  - c) Current
  - d) Voltage
- 9) In an arc welded joint poor fusion is due to which of the following?
  - a) Improper current
  - b) High welding speed
  - c) Uncleaned metal surface
  - d) Lack of flux
- 10) Spot welding is used for \_\_\_\_\_.
  - a) Thin metal sheets
  - b) Rough and irregular surfaces
  - c) Costing only
  - d) Thick sections
- 11) \_\_\_\_\_ welding is not a resistance welding process.
  - a) Projection
  - b) Seam
  - c) Flush
  - d) Carbon arc
- 12) Which of the following is an advantage of electric traction over other method of traction?
  - a) Faster acceleration
  - b) No pollution problems
  - c) Better braking action
  - d) All of the above
- 13) Which of the following is the voltage for single phase AC system?
  - a) 22V
  - b) 440V
  - c) 5KV
  - d) 15KV
- 14) Which of the following is the advantage of electric braking?
  - a) It avoids wear of track
  - b) Motor continues to remain loaded during braking
  - c) It is instantaneous
  - d) More heat is generated during braking

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Set **R**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Utilisation**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four questions. 16**

- Describe with the help of a neat diagram the construction and working of a high pressure mercury vapour lamp.
- What do you understand by direct, indirect and semi-indirect lighting?
- Explain the method of induction heating and describe coreless type of induction furnaces.
- Explain with a neat sketch how the spot welding is carried out by a spot welding machine.
- A 250 V lamp has a total flux of 3000 lumens and takes a current of 0.8 A. Calculate
  - lumens/watt
  - M.S.C.P./watt

**Q.3 Solve any two questions. 12**

- What is dielectric heating? Explain the factors on which the dielectric loss in a dielectric material depends.
- A hall measuring 27.5m x 45.75m is to be illuminated using 200 watt filament lamps. The luminous efficiency of the 200 watt filament lamp is 14.4 lumens/watt. Inside the hall an average illumination of 108 lumens/m<sup>2</sup> is to be provided on the working plane. The walls and ceiling are brightly painted. Take coefficient of utilization as 0.35 and depreciation factor as 0.9. Calculate the number of lamps required for this.
- Discuss in detail the principle of operation of (i) Ultrasonic welding and (ii) Laser welding.

**Section – II**

**Q.4 Solve any four questions. 16**

- What do you mean by "Electric traction"? What are the requirements of an ideal traction system? How are they met in an electric traction system?
- What are the various traction systems in practice in our country? Give the advantages of electric drives with its limitations and discuss briefly the factors governing the final choice of traction system.
- What do you understand by speed-time curves? What is its use in practice? Explain clearly 'free running', 'coasting' and 'braking' with reference to electric traction systems.
- Explain speed-time curve of a train running on main line. Define 'crest speed', 'average speed' and 'schedule speed'.
- Derive a suitable equation to determine  $V_m$  from a simplified speed-time curve.

**Q.5 Solve any two questions.****12**

- a)** Describe the procedure of calculating the specific energy consumption of an electric train.
- b)** Write short notes on the following.
  - i) Factors affecting energy consumption in propelling a train.
  - ii) Mechanics of 'train movement'
  - iii) Dead weight, accelerating weight and adhesive weight of a train
  - iv) Tractive effort for propulsion of train
- c)** A schedule speed of 45km/h is required between two stops 1.5 km apart. Find the maximum speed over the run if the stop is of 20 second duration. The values of acceleration and retardation are 2.4 km/h/s and 3.2 km/h/s respectively. Assume a simplified trapezoidal speed time curve.

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Utilisation**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Spot welding is used for \_\_\_\_\_.  
 a) Thin metal sheets                      b) Rough and irregular surfaces  
 c) Costing only                                d) Thick sections
- 2) \_\_\_\_\_ welding is no a resistance welding process.  
 a) Projection                                    b) Seam  
 c) Flush                                            d) Carbon arc
- 3) Which of the following is an advantage of electric traction over other method of traction?  
 a) Faster acceleration                      b) No pollution problems  
 c) Better braking action                      d) All of the above
- 4) Which of the following is the voltage for single phase AC system?  
 a) 22V                                              b) 440V  
 c) 5KV                                                d) 15KV
- 5) Which of the following is the advantage of electric braking?  
 a) It avoids wear of track  
 b) Motor continues to remain loaded during braking  
 c) It is instantaneous  
 d) More heat is generated during braking
- 6) Quadrilateral speed time curve pertains to which of the following services?  
 a) Main line service                            b) Urban service  
 c) Sub-urban service                            d) Urban and sub-urban service
- 7) Speed time curve of main line service differs from those of urban and sub-urban services on following account  
 a) It has longer free running period  
 b) It has longer coasting period  
 c) Accelerating and braking periods are comparatively smaller  
 d) All of above

- 8) The specific energy consumption of a train depends on which of the following
- a) Acceleration and retardation
  - b) Gradient
  - c) Distance covered
  - d) All of above
- 9) Energy consumption in propelling the train is required for which of the following?
- a) Work against the resistance to motion
  - b) Work against gravity while moving up the gradient
  - c) Acceleration
  - d) All of above
- 10) Candela is the unit of which of the following?
- a) Wavelength
  - b) Luminous intensity
  - c) Luminous Flux
  - d) Frequency
- 11) Desired illumination level of the working plane depends upon
- a) Whether the object is stationary or moving
  - b) Size of the object to seen and its distance from the observer
  - c) Whether the object is to be seen for longer duration or shorter duration of time
  - d) All of above
- 12) \_\_\_\_\_ is used for heating non-conducting materials
- a) Eddy current heating
  - b) Arc heating
  - c) Induction heating
  - d) Dielectric heating
- 13) In induction heating \_\_\_\_\_ is abnormally high.
- a) Phase angle
  - b) Frequency
  - c) Current
  - d) Voltage
- 14) In an arc welded joint poor fusion is due to which of the following?
- a) Improper current
  - b) High welding speed
  - c) Uncleaned metal surface
  - d) Lack of flux

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Utilisation**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four questions. 16**

- Describe with the help of a neat diagram the construction and working of a high pressure mercury vapour lamp.
- What do you understand by direct, indirect and semi-indirect lighting?
- Explain the method of induction heating and describe coreless type of induction furnaces.
- Explain with a neat sketch how the spot welding is carried out by a spot welding machine.
- A 250 V lamp has a total flux of 3000 lumens and takes a current of 0.8 A. Calculate
  - lumens/watt
  - M.S.C.P./watt

**Q.3 Solve any two questions. 12**

- What is dielectric heating? Explain the factors on which the dielectric loss in a dielectric material depends.
- A hall measuring 27.5m x 45.75m is to be illuminated using 200 watt filament lamps. The luminous efficiency of the 200 watt filament lamp is 14.4 lumens/watt. Inside the hall an average illumination of 108 lumens/m<sup>2</sup> is to be provided on the working plane. The walls and ceiling are brightly painted. Take coefficient of utilization as 0.35 and depreciation factor as 0.9. Calculate the number of lamps required for this.
- Discuss in detail the principle of operation of (i) Ultrasonic welding and (ii) Laser welding.

**Section – II**

**Q.4 Solve any four questions. 16**

- What do you mean by "Electric traction"? What are the requirements of an ideal traction system? How are they met in an electric traction system?
- What are the various traction systems in practice in our country? Give the advantages of electric drives with its limitations and discuss briefly the factors governing the final choice of traction system.
- What do you understand by speed-time curves? What is its use in practice? Explain clearly 'free running', 'coasting' and 'braking' with reference to electric traction systems.
- Explain speed-time curve of a train running on main line. Define 'crest speed', 'average speed' and 'schedule speed'.
- Derive a suitable equation to determine  $V_m$  from a simplified speed-time curve.

**Q.5 Solve any two questions.****12**

- a)** Describe the procedure of calculating the specific energy consumption of an electric train.
- b)** Write short notes on the following.
  - i) Factors affecting energy consumption in propelling a train.
  - ii) Mechanics of 'train movement'
  - iii) Dead weight, accelerating weight and adhesive weight of a train
  - iv) Tractive effort for propulsion of train
- c)** A schedule speed of 45km/h is required between two stops 1.5 km apart. Find the maximum speed over the run if the stop is of 20 second duration. The values of acceleration and retardation are 2.4 km/h/s and 3.2 km/h/s respectively. Assume a simplified trapezoidal speed time curve.



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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Electronics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

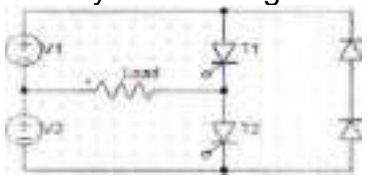
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) An SCR is a \_\_\_\_\_.  
 a) four layer, four junction device    b) four layer, three junction device  
 c) four layer, two junction device    d) three layer, single junction device
- 2) The static V-I curve for the SCR is plotted for \_\_\_\_\_.  
 a)  $I_a$  (anode current) vs  $I_g$  (gate current),  $V_a$  (anode - cathode voltage) as a parameter  
 b)  $I_a$  vs  $V_a$  with  $I_g$  as a parameter  
 c)  $V_a$  vs  $I_g$  with  $I_a$  as a parameter  
 d)  $I_g$  vs  $V_g$  with  $I_a$  as a parameter
- 3) For an SCR in the reverse blocking mode, (practically) \_\_\_\_\_.  
 a) leakage current does not flow  
 b) leakage current flows from anode to cathode  
 c) leakage current flows from cathode to anode  
 d) leakage current flows from gate to anode
- 4) Higher the magnitude of the gate pulse \_\_\_\_\_.  
 a) lesser is the time required to inject the charges.  
 b) greater is the time required to inject the charges.  
 c) greater is the value of anode current  
 d) lesser is the value of anode current
- 5) The DIAC can be represented by \_\_\_\_\_.  
 a) two SCRs in anti-parallel    b) two SCRs in parallel  
 c) two diodes in anti-parallel    d) two diodes in parallel
- 6) The GTO can be turned off \_\_\_\_\_.  
 a) by a positive gate pulse  
 b) by a negative gate pulse  
 c) by a negative anode-cathode voltage  
 d) by removing the gate pulse
- 7) The average output voltage is maximum when SCR is triggered at  $\omega t =$  \_\_\_\_\_.  
 a)  $\pi$     b) 0  
 c)  $\pi/2$     d)  $\pi/4$

- 8) A single-phase half-wave thyristor circuit with R load is triggered at an angle of  $\alpha = 0^\circ$ . As such, the maximum value of the average output voltage would be given by Consider  $V_s = V_m \sin \omega t$
- $V_m/\pi$
  - $2V_m/\pi$
  - $V_m$
  - $V_m/\alpha$
- 9) A single-phase half wave circuit has  $V_s = 230$  V with a R load of  $100 \Omega$ . Find the average load current at  $\alpha = 30^\circ$ .
- 0.96 A
  - 0.57 A
  - 1.45 A
  - 2.3 A
- 10) For a single phase half-wave thyristor circuit with R load, the input power factor is given by \_\_\_\_\_.
- rms source voltage/total rms line current
  - rms input power/power delivered to the load
  - $\cos \alpha$
  - power delivered to load/input VA
- 11) Choppers convert from \_\_\_\_\_.
- fixed AC to fixed DC
  - fixed DC to variable AC
  - fixed DC to variable DC
  - constant AC to variable AC
- 12) In a VSI (Voltage source inverter) \_\_\_\_\_.
- the internal impedance of the DC source is negligible
  - the internal impedance of the DC source is very very high
  - the internal impedance of the AC source is negligible
  - All of the above
- 13) Identify the circuit given below.
- 
- Half wave series inverter
  - Full wave series inverter
  - 1-ph Half bridge inverter
  - Half wave parallel inverter
- 14) Earlier than the semiconductor technology, \_\_\_\_\_ devices were used for voltage control applications.
- cycloconverters
  - vacuum tubes
  - tap changing transformer
  - induction machine

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Electronics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.

**Section – I**

**Q.2 Answer the following. (Any Four)**

16

- In how many stages the SCR will operates and explain with neat I-V characteristics.
- What is Natural commutation? And explain with neat circuit diagram and waveforms.
- Explain the principle of operation of n- channel MOSFET with its V-I Characteristics.
- What is necessity of Freewheeling Diode and explain with example?
- A1-Ph halfwave-controlled rectifier with resistive load, if firing angle  $\alpha = \pi/4$  rad/sec,  $V_s = 230$  V,  $R = 5\Omega$  Find
  - Average output voltage
  - RMS output voltage
  - Power delivered to load

**Q.3 Answer the following. (Any Two)**

12

- Define the following.
  - Peak working forward voltage ( $V_{DWM}$ )
  - Peak working reverse voltage ( $V_{RWM}$ )
  - Peak Surge forward Voltage ( $V_{DSM}$ )
  - Forward  $dv/dt$  Rating of SCR
- Explain four mode operation of TRIAC with V-I characteristic.
- Explain the principle of operation of 3- phase semi converter for R load, also draw the waveforms for firing angle  $\alpha = 60^\circ$ .

**Section – II**

**Q.4 Answer the following. (Any Four)**

16

- Draw and Explain step up chopper. Also derive expression of average output voltage.
- Explain various methods of voltage control in inverter.
- What are the classifications of Inverters and explain?
- Draw & explain with neat waveforms of single-phase full bridge inverter for R load.
- What is Integral cycle control and Phase control of A.C. Voltage controller and explain?

**Q.5 Answer the following. (Any Two)**

- a)** A Step up chopper has input voltage of 220 V and output voltage of 660V. If the conducting time of thyristor-chopper is 100 $\mu$ sec, compute the pulse width of output voltage. In case output-voltage pulse width is halved for constant frequency operation, find the average value of new output voltage.
- b)** Explain 3-ph full bridge inverter for 120° mode of operation and draw the phase and line voltage waveforms. Assume load is star connected balanced load.
- c)** What is UPS? And explain with neat circuit diagrams.

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Electronics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

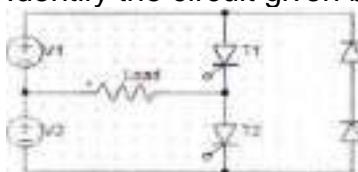
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A single-phase half-wave thyristor circuit with R load is triggered at an angle of  $\alpha = 0^\circ$ . As such, the maximum value of the average output voltage would be given by Consider  $V_s = V_m \sin \omega t$ 
  - a)  $V_m/\pi$
  - b)  $2V_m/\pi$
  - c)  $V_m$
  - d)  $V_m/\alpha$
- 2) A single-phase half wave circuit has  $V_s = 230$  V with a R load of  $100 \Omega$ . Find the average load current at  $\alpha = 30^\circ$ .
  - a) 0.96 A
  - b) 0.57 A
  - c) 1.45 A
  - d) 2.3 A
- 3) For a single phase half-wave thyristor circuit with R load, the input power factor is given by \_\_\_\_\_.
  - a) rms source voltage/total rms line current
  - b) rms input power/power delivered to the load
  - c)  $\cos \alpha$
  - d) power delivered to load/input VA
- 4) Choppers convert from \_\_\_\_\_.
  - a) fixed AC to fixed DC
  - b) fixed DC to variable AC
  - c) fixed DC to variable DC
  - d) constant AC to variable AC
- 5) In a VSI (Voltage source inverter) \_\_\_\_\_.
  - a) the internal impedance of the DC source is negligible
  - b) the internal impedance of the DC source is very very high
  - c) the internal impedance of the AC source is negligible
  - d) All of the above
- 6) Identify the circuit given below.



- a) Half wave series inverter
- b) Full wave series inverter
- c) 1-ph Half bridge inverter
- d) Half wave parallel inverter

- 7) Earlier than the semiconductor technology, \_\_\_\_\_ devices were used for voltage control applications.
- a) cycloconverters
  - b) vacuum tubes
  - c) tap changing transformer
  - d) induction machine
- 8) An SCR is a \_\_\_\_\_.
- a) four layer, four junction device
  - b) four layer, three junction device
  - c) four layer, two junction device
  - d) three layer, single junction device
- 9) The static V-I curve for the SCR is plotted for \_\_\_\_\_.
- a)  $I_a$  (anode current) vs  $I_g$  (gate current),  $V_a$  (anode - cathode voltage) as a parameter
  - b)  $I_a$  vs  $V_a$  with  $I_g$  as a parameter
  - c)  $V_a$  vs  $I_g$  with  $I_a$  as a parameter
  - d)  $I_g$  vs  $V_g$  with  $I_a$  as a parameter
- 10) For an SCR in the reverse blocking mode, (practically) \_\_\_\_\_.
- a) leakage current does not flow
  - b) leakage current flows from anode to cathode
  - c) leakage current flows from cathode to anode
  - d) leakage current flows from gate to anode
- 11) Higher the magnitude of the gate pulse \_\_\_\_\_.
- a) lesser is the time required to inject the charges.
  - b) greater is the time required to inject the charges.
  - c) greater is the value of anode current
  - d) lesser is the value of anode current
- 12) The DIAC can be represented by \_\_\_\_\_.
- a) two SCRs in anti-parallel
  - b) two SCRs in parallel
  - c) two diodes in anti-parallel
  - d) two diodes in parallel
- 13) The GTO can be turned off \_\_\_\_\_.
- a) by a positive gate pulse
  - b) by a negative gate pulse
  - c) by a negative anode-cathode voltage
  - d) by removing the gate pulse
- 14) The average output voltage is maximum when SCR is triggered at  $\omega t =$  \_\_\_\_\_
- a)  $\pi$
  - b) 0
  - c)  $\pi/2$
  - d)  $\pi/4$

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Electronics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.

**Section – I**

**Q.2 Answer the following. (Any Four)** **16**

- In how many stages the SCR will operates and explain with neat I-V characteristics.
- What is Natural commutation? And explain with neat circuit diagram and waveforms.
- Explain the principle of operation of n- channel MOSFET with its V-I Characteristics.
- What is necessity of Freewheeling Diode and explain with example?
- A1-Ph halfwave-controlled rectifier with resistive load, if firing angle  $\alpha = \pi/4$  rad/sec,  $V_s = 230$  V,  $R = 5\Omega$  Find
  - Average output voltage
  - RMS output voltage
  - Power delivered to load

**Q.3 Answer the following. (Any Two)** **12**

- Define the following.
  - Peak working forward voltage ( $V_{DWM}$ )
  - Peak working reverse voltage ( $V_{RWM}$ )
  - Peak Surge forward Voltage ( $V_{DSM}$ )
  - Forward  $dv/dt$  Rating of SCR
- Explain four mode operation of TRIAC with V-I characteristic.
- Explain the principle of operation of 3- phase semi converter for R load, also draw the waveforms for firing angle  $\alpha = 60^\circ$ .

**Section – II**

**Q.4 Answer the following. (Any Four)** **16**

- Draw and Explain step up chopper. Also derive expression of average output voltage.
- Explain various methods of voltage control in inverter.
- What are the classifications of Inverters and explain?
- Draw & explain with neat waveforms of single-phase full bridge inverter for R load.
- What is Integral cycle control and Phase control of A.C. Voltage controller and explain?

**Q.5 Answer the following. (Any Two)**

- a)** A Step up chopper has input voltage of 220 V and output voltage of 660V. If the conducting time of thyristor-chopper is  $100\mu\text{sec}$ , compute the pulse width of output voltage. In case output-voltage pulse width is halved for constant frequency operation, find the average value of new output voltage.
- b)** Explain 3-ph full bridge inverter for  $120^\circ$  mode of operation and draw the phase and line voltage waveforms. Assume load is star connected balanced load.
- c)** What is UPS? And explain with neat circuit diagrams.



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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Electronics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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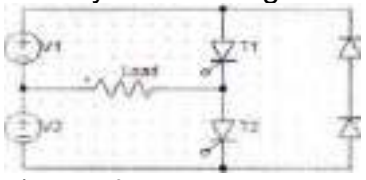
**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Choppers convert from \_\_\_\_\_.  
 a) fixed AC to fixed DC                      b) fixed DC to variable AC  
 c) fixed DC to variable DC                  d) constant AC to variable AC
- 2) In a VSI (Voltage source inverter) \_\_\_\_\_.  
 a) the internal impedance of the DC source is negligible  
 b) the internal impedance of the DC source is very very high  
 c) the internal impedance of the AC source is negligible  
 d) All of the above
- 3) Identify the circuit given below.  

 a) Half wave series inverter                      b) Full wave series inverter  
 c) 1-ph Half bridge inverter                  d) Half wave parallel inverter
- 4) Earlier than the semiconductor technology, \_\_\_\_\_ devices were used for voltage control applications.  
 a) cycloconverters                              b) vacuum tubes  
 c) tap changing transformer                  d) induction machine
- 5) An SCR is a \_\_\_\_\_.  
 a) four layer, four junction device          b) four layer, three junction device  
 c) four layer, two junction device          d) three layer, single junction device
- 6) The static V-I curve for the SCR is plotted for \_\_\_\_\_.  
 a)  $I_a$  (anode current) vs  $I_g$  (gate current),  $V_a$  (anode - cathode voltage) as a parameter  
 b)  $I_a$  vs  $V_a$  with  $I_g$  as a parameter  
 c)  $V_a$  vs  $I_g$  with  $I_a$  as a parameter  
 d)  $I_g$  vs  $V_g$  with  $I_a$  as a parameter

- 7) For an SCR in the reverse blocking mode, (practically) \_\_\_\_\_.  
 a) leakage current does not flow  
 b) leakage current flows from anode to cathode  
 c) leakage current flows from cathode to anode  
 d) leakage current flows from gate to anode
- 8) Higher the magnitude of the gate pulse \_\_\_\_\_.  
 a) lesser is the time required to inject the charges.  
 b) greater is the time required to inject the charges.  
 c) greater is the value of anode current  
 d) lesser is the value of anode current
- 9) The DIAC can be represented by \_\_\_\_\_.  
 a) two SCRs in anti-parallel      b) two SCRs in parallel  
 c) two diodes in anti-parallel      d) two diodes in parallel
- 10) The GTO can be turned off \_\_\_\_\_.  
 a) by a positive gate pulse  
 b) by a negative gate pulse  
 c) by a negative anode-cathode voltage  
 d) by removing the gate pulse
- 11) The average output voltage is maximum when SCR is triggered at  $\omega t =$  \_\_\_\_\_.  
 a)  $\pi$       b) 0  
 c)  $\pi/2$       d)  $\pi/4$
- 12) A single-phase half-wave thyristor circuit with R load is triggered at an angle of  $\alpha = 0^\circ$ . As such, the maximum value of the average output voltage would be given by Consider  $V_s = V_m \sin \omega t$   
 a)  $V_m/\pi$       b)  $2V_m/\pi$   
 c)  $V_m$       d)  $V_m/\alpha$
- 13) A single-phase half wave circuit has  $V_s = 230$  V with a R load of  $100 \Omega$ . Find the average load current at  $\alpha = 30^\circ$ .  
 a) 0.96 A      b) 0.57 A  
 c) 1.45 A      d) 2.3 A
- 14) For a single phase half-wave thyristor circuit with R load, the input power factor is given by \_\_\_\_\_.  
 a) rms source voltage/total rms line current  
 b) rms input power/power delivered to the load  
 c)  $\cos \alpha$   
 d) power delivered to load/input VA

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Electronics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.

**Section – I**

**Q.2 Answer the following. (Any Four)** **16**

- In how many stages the SCR will operates and explain with neat I-V characteristics.
- What is Natural commutation? And explain with neat circuit diagram and waveforms.
- Explain the principle of operation of n- channel MOSFET with its V-I Characteristics.
- What is necessity of Freewheeling Diode and explain with example?
- A1-Ph halfwave-controlled rectifier with resistive load, if firing angle  $\alpha = \pi/4$  rad/sec,  $V_s = 230$  V,  $R = 5\Omega$  Find
  - Average output voltage
  - RMS output voltage
  - Power delivered to load

**Q.3 Answer the following. (Any Two)** **12**

- Define the following.
  - Peak working forward voltage ( $V_{DWM}$ )
  - Peak working reverse voltage ( $V_{RWM}$ )
  - Peak Surge forward Voltage ( $V_{DSM}$ )
  - Forward  $dv/dt$  Rating of SCR
- Explain four mode operation of TRIAC with V-I characteristic.
- Explain the principle of operation of 3- phase semi converter for R load, also draw the waveforms for firing angle  $\alpha = 60^\circ$ .

**Section – II**

**Q.4 Answer the following. (Any Four)** **16**

- Draw and Explain step up chopper. Also derive expression of average output voltage.
- Explain various methods of voltage control in inverter.
- What are the classifications of Inverters and explain?
- Draw & explain with neat waveforms of single-phase full bridge inverter for R load.
- What is Integral cycle control and Phase control of A.C. Voltage controller and explain?

**Q.5 Answer the following. (Any Two)**

- a)** A Step up chopper has input voltage of 220 V and output voltage of 660V. If the conducting time of thyristor-chopper is  $100\mu\text{sec}$ , compute the pulse width of output voltage. In case output-voltage pulse width is halved for constant frequency operation, find the average value of new output voltage.
- b)** Explain 3-ph full bridge inverter for  $120^\circ$  mode of operation and draw the phase and line voltage waveforms. Assume load is star connected balanced load.
- c)** What is UPS? And explain with neat circuit diagrams.

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Electronics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

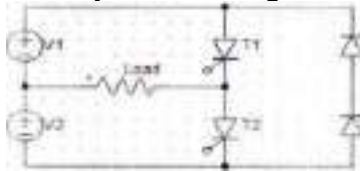
**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The GTO can be turned off \_\_\_\_\_.  
 a) by a positive gate pulse  
 b) by a negative gate pulse  
 c) by a negative anode-cathode voltage  
 d) by removing the gate pulse
- 2) The average output voltage is maximum when SCR is triggered at  $\omega t =$  \_\_\_\_\_.  
 a)  $\pi$   
 b) 0  
 c)  $\pi/2$   
 d)  $\pi/4$
- 3) A single-phase half-wave thyristor circuit with R load is triggered at an angle of  $\alpha = 0^\circ$ . As such, the maximum value of the average output voltage would be given by Consider  $V_s = V_m \sin \omega t$   
 a)  $V_m/\pi$   
 b)  $2V_m/\pi$   
 c)  $V_m$   
 d)  $V_m/\alpha$
- 4) A single-phase half wave circuit has  $V_s = 230$  V with a R load of  $100 \Omega$ . Find the average load current at  $\alpha = 30^\circ$ .  
 a) 0.96 A  
 b) 0.57 A  
 c) 1.45 A  
 d) 2.3 A
- 5) For a single phase half-wave thyristor circuit with R load, the input power factor is given by \_\_\_\_\_.  
 a) rms source voltage/total rms line current  
 b) rms input power/power delivered to the load  
 c)  $\cos \alpha$   
 d) power delivered to load/input VA
- 6) Choppers convert from \_\_\_\_\_.  
 a) fixed AC to fixed DC  
 b) fixed DC to variable AC  
 c) fixed DC to variable DC  
 d) constant AC to variable AC

- 7) In a VSI (Voltage source inverter) \_\_\_\_\_.  
 a) the internal impedance of the DC source is negligible  
 b) the internal impedance of the DC source is very very high  
 c) the internal impedance of the AC source is negligible  
 d) All of the above

- 8) Identify the circuit given below.



- a) Half wave series inverter      b) Full wave series inverter  
 c) 1-ph Half bridge inverter      d) Half wave parallel inverter
- 9) Earlier than the semiconductor technology, \_\_\_\_\_ devices were used for voltage control applications.  
 a) cycloconverters      b) vacuum tubes  
 c) tap changing transformer      d) induction machine
- 10) An SCR is a \_\_\_\_\_.  
 a) four layer, four junction device      b) four layer, three junction device  
 c) four layer, two junction device      d) three layer, single junction device
- 11) The static V-I curve for the SCR is plotted for \_\_\_\_\_.  
 a)  $I_a$  (anode current) vs  $I_g$  (gate current),  $V_a$  (anode - cathode voltage) as a parameter  
 b)  $I_a$  vs  $V_a$  with  $I_g$  as a parameter  
 c)  $V_a$  vs  $I_g$  with  $I_a$  as a parameter  
 d)  $I_g$  vs  $V_g$  with  $I_a$  as a parameter
- 12) For an SCR in the reverse blocking mode, (practically) \_\_\_\_\_.  
 a) leakage current does not flow  
 b) leakage current flows from anode to cathode  
 c) leakage current flows from cathode to anode  
 d) leakage current flows from gate to anode
- 13) Higher the magnitude of the gate pulse \_\_\_\_\_.  
 a) lesser is the time required to inject the charges.  
 b) greater is the time required to inject the charges.  
 c) greater is the value of anode current  
 d) lesser is the value of anode current
- 14) The DIAC can be represented by \_\_\_\_\_.  
 a) two SCRs in anti-parallel      b) two SCRs in parallel  
 c) two diodes in anti-parallel      d) two diodes in parallel

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**T. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Electronics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks  
 2) All questions are compulsory.

**Section – I**

**Q.2 Answer the following. (Any Four)** **16**

- a) In how many stages the SCR will operates and explain with neat I-V characteristics.
- b) What is Natural commutation? And explain with neat circuit diagram and waveforms.
- c) Explain the principle of operation of n- channel MOSFET with its V-I Characteristics.
- d) What is necessity of Freewheeling Diode and explain with example?
- e) A1-Ph halfwave-controlled rectifier with resistive load, if firing angle  $\alpha = \pi/4$  rad/sec,  $V_s = 230$  V,  $R = 5\Omega$  Find
  - 1) Average output voltage
  - 2) RMS output voltage
  - 3) Power delivered to load

**Q.3 Answer the following. (Any Two)** **12**

- a) Define the following.
  - 1) Peak working forward voltage ( $V_{DWM}$ )
  - 2) Peak working reverse voltage ( $V_{RWM}$ )
  - 3) Peak Surge forward Voltage ( $V_{DSM}$ )
  - 4) Forward  $dv/dt$  Rating of SCR
- b) Explain four mode operation of TRIAC with V-I characteristic.
- c) Explain the principle of operation of 3- phase semi converter for R load, also draw the waveforms for firing angle  $\alpha = 60^\circ$ .

**Section – II**

**Q.4 Answer the following. (Any Four)** **16**

- a) Draw and Explain step up chopper. Also derive expression of average output voltage.
- b) Explain various methods of voltage control in inverter.
- c) What are the classifications of Inverters and explain?
- d) Draw & explain with neat waveforms of single-phase full bridge inverter for R load.
- e) What is Integral cycle control and Phase control of A.C. Voltage controller and explain?

**Q.5 Answer the following. (Any Two)**

- a)** A Step up chopper has input voltage of 220 V and output voltage of 660V. If the conducting time of thyristor-chopper is 100 $\mu$ sec, compute the pulse width of output voltage. In case output-voltage pulse width is halved for constant frequency operation, find the average value of new output voltage.
- b)** Explain 3-ph full bridge inverter for 120° mode of operation and draw the phase and line voltage waveforms. Assume load is star connected balanced load.
- c)** What is UPS? And explain with neat circuit diagrams.



**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Signals and Systems**

Max. Marks: 70

### MCQ/Objective Type Questions

Marks:14

14

- Page 1 of 16

- Page 2 of 16

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Signals and Systems**

Day & Date: Wednesday 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

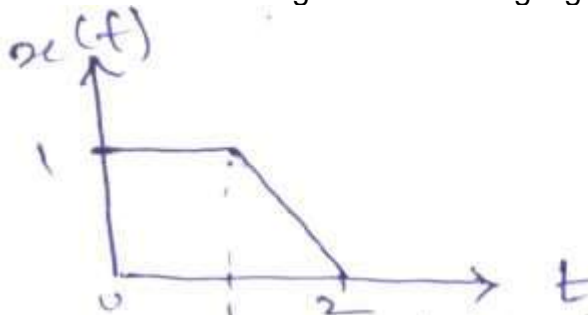
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

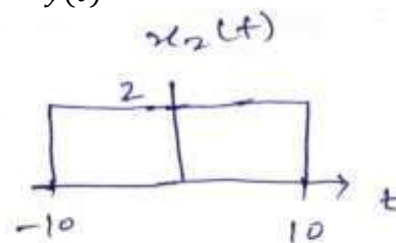
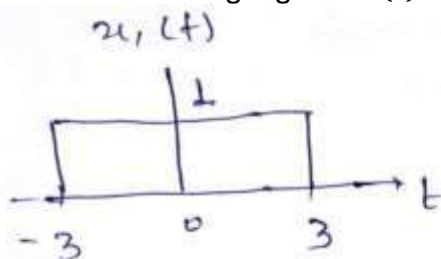
**Q.2 Solve Any Four**

**16**

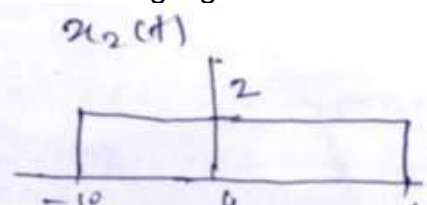
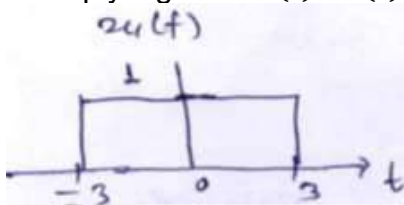
- a) Explain different types of signals.  
 b) Find Even and Odd signal for following signal



- c) Subtract following signal  $x_1(t) - x_2(t) = y(t)$



- d) Multiply signals  $x_1(t) \cdot x_2(t) = y(t)$  for following signal.

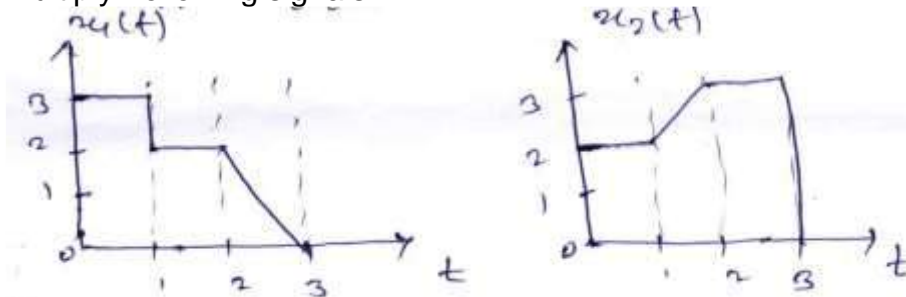


- e) Draw following Discrete time signal in Graphical form -  
 $x(-3) = -1, x(-2) = 2, x(-1) = 0, x(0) = 1, x(1) = 2, x(2) = 3, x(3) = 2$

12

**Q.3 Solve Any Two**

- a) Determine the power and energy of the signal  $A \sin(\omega_0 t + \varphi) = x(t)$   
 b) Multiply Following signals



- c) Check given signal is Linear or Non- Linear.

$$\frac{d^2 y(+)}{dt^2} + 3ty(t) = t^2 x(t)$$

**Section – II****Q.4 Solve Any Four**

16

- a) Explain following properties for Continuous Time Fourier Transform.  
 i) Linearity  
 ii) Frequency shifting  
 iii) Time shifting  
 iv) Time scaling  
 b) Find magnitude and phase spectrum for  $x(t) = \delta(t)$   
 c) Find Z transform and ROC for signal  $x[n] = b^n u[-n - 1]$   
 d) Explain Linearity and Time shifting Property for Z transform  
 e) Give the Property of Region of Conversion

**Q.5 Solve Any Two**

12

- a) Find Z transform & ROC of  $x[n] = \sin(\omega_0 n)u[n]$   
 b) Explain magnitude and phase spectrum for Fourier transform  
 c) Determine Fourier Transform of Gaussian pulse  $x(t) = e^{-b^2 t^2}$

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Day & Date: Wednesday 22-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

## Marks:14

14

- 1) For even signal  $b_n = \underline{\hspace{2cm}}$ .  
a) 1  
b) 0  
c) Infinity  
d) None
- 2) The Convolution Property states that,  $\underline{\hspace{2cm}}$ .  
a)  $Fs\{x_1(t) \times x_2(t)\} = To.Cn.Dn$   
b)  $Fs\{x_1(t) \times x_2(t)\} = Cn.Dn$   
c)  $Fs\{x_1(t) \times x_2(t)\} = To.Cn.$   
d) None
- 3) For Odd Signal,  $a_0 = \underline{\hspace{2cm}}$   $a_n = \underline{\hspace{2cm}}$ .  
a) 0,0  
b) 0,1  
c) 1,1  
d) None
- 4) ROC of Z-transform is  $\underline{\hspace{2cm}}$  in Z-plane centered at  $\underline{\hspace{2cm}}$ .  
a) Circular Disk, Origin  
b) Concentric ring, one  
c) Circular Disk, infinity  
d) Concentric ring, infinity
- 5) ROC of LT1 stable system contains  $\underline{\hspace{2cm}}$ .  
a) Circle  
b) Unit circle  
c) Square  
d) None
- 6) Parseval's theorem states that,  $\underline{\hspace{2cm}}$  of signal may be defined in terms of its Fourier Series coefficients.  
a) Energy  
b) Strength  
c) Power  
d) All
- 7) The Z transform of Discrete Time sequence  $x[n]$  is  $\underline{\hspace{2cm}}$ .  
a)  $x[z] = \sum_{n=0}^{\infty} x[n].z^n$   
b)  $x[z] = x[n].z^n$   
c)  $x[z] = \sum_{n=-\infty}^{\infty} x[n].z^{-n}$   
d)  $x[z] = \sum_{n=-\infty}^{\infty} x[n].z^n$
- 8) The signals  $x(t) = e^{-5t}$   $\underline{\hspace{2cm}}$ .  
a) Odd  
b) Even  
c) Neither odd nor even  
d) Both

- 9) Which mathematical notation specifies the condition of periodicity for a continuous time signal?
- a)  $x(t) = x(t + T_0)$                       b)  $x(n) = x(n + N)$   
c)  $x(t) = e^{-\alpha t}$                       d) None of the above
- 10) The signal  $x(t) = \sin 5t u(t)$  is \_\_\_\_\_.  
a) Casual                      b) Non casual  
c) Anti-casual                      d) None
- 11) The systems  $y(t) = x(t - 4)$  is \_\_\_\_\_.  
a) Static                      b) Dynamic  
c) Both a and b                      d) None
- 12) The signal  $x(t) = \cos 3t$  is \_\_\_\_\_.  
a) Causal                      b) Non causal  
c) Anti causal                      d) None
- 13) The given system  $y(t) = 3 + x(t)$  is \_\_\_\_\_.  
a) Invertible                      b) Non-invertible  
c) Both a and b                      d) None
- 14) The given systems  $y(t) = 5 + x(t)$  is \_\_\_\_\_.  
a) Invertible                      b) Non-invertible  
c) Both a and b                      d) None

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Signals and Systems**

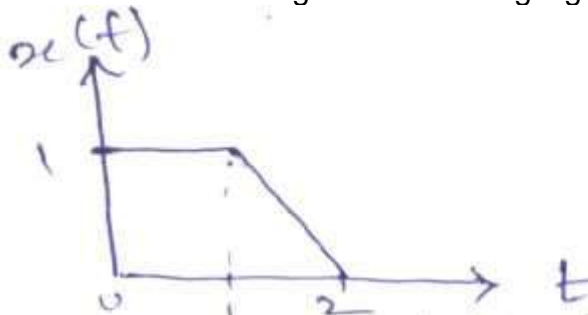
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 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

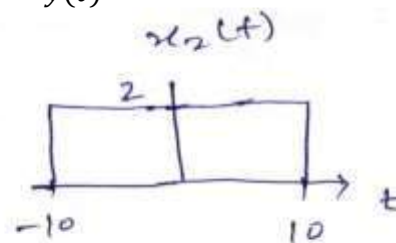
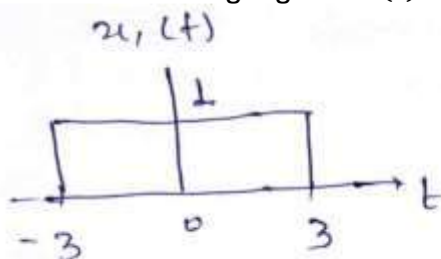
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Solve Any Four****16**

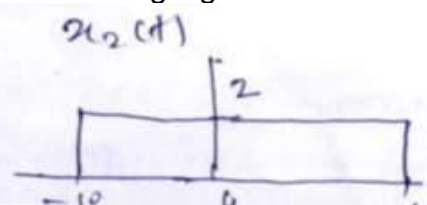
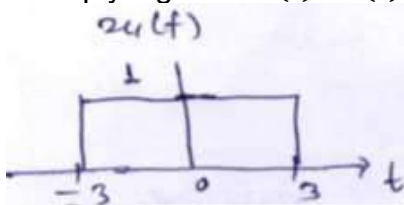
- a) Explain different types of signals.  
 b) Find Even and Odd signal for following signal



- c) Subtract following signal  $x_1(t) - x_2(t) = y(t)$



- d) Multiply signals  $x_1(t) \cdot x_2(t) = y(t)$  for following signal.

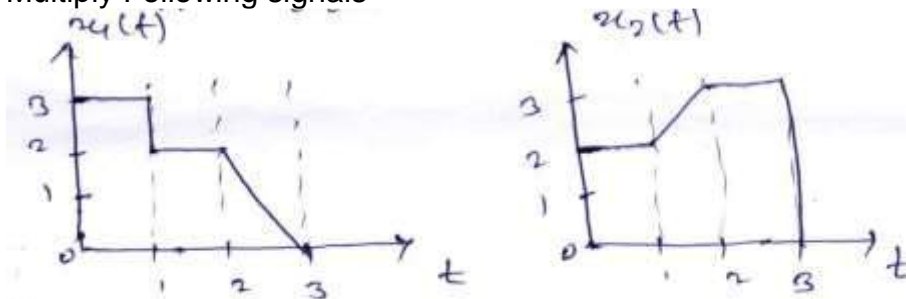


- e) Draw following Discrete time signal in Graphical form -  
 $x(-3) = -1, x(-2) = 2, x(-1) = 0, x(0) = 1, x(1) = 2, x(2) = 3, x(3) = 2$

12

**Q.3 Solve Any Two**

- a) Determine the power and energy of the signal  $A \sin(\omega_0 t + \varphi) = x(t)$   
 b) Multiply Following signals



- c) Check given signal is Linear or Non- Linear.

$$\frac{d^2 y(+)}{dt^2} + 3ty(t) = t^2 x(t)$$

**Section – II****Q.4 Solve Any Four**

16

- a) Explain following properties for Continuous Time Fourier Transform.  
 i) Linearity  
 ii) Frequency shifting  
 iii) Time shifting  
 iv) Time scaling  
 b) Find magnitude and phase spectrum for  $x(t) = \delta(t)$   
 c) Find Z transform and ROC for signal  $x[n] = b^n u[-n - 1]$   
 d) Explain Linearity and Time shifting Property for Z transform  
 e) Give the Property of Region of Conversion

**Q.5 Solve Any Two**

12

- a) Find Z transform & ROC of  $x[n] = \sin(\omega_0 n)u[n]$   
 b) Explain magnitude and phase spectrum for Fourier transform  
 c) Determine Fourier Transform of Gaussian pulse  $x(t) = e^{-b^2 t^2}$



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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Signals and Systems**

Day & Date: Wednesday 22-02-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) ROC of Z-transform is \_\_\_\_\_ in Z-plane centered at \_\_\_\_\_.  
 a) Circular Disk, Origin                      b) Concentric ring, one  
 c) Circular Disk, infinity                      d) Concentric ring, infinity
- 2) ROC of LT1 stable system contains \_\_\_\_\_.  
 a) Circle                                              b) Unit circle  
 c) Square                                              d) None
- 3) Parseval's theorem states that, \_\_\_\_\_ of signal may be defined in terms of its Fourier Series coefficients.  
 a) Energy                                              b) Strength  
 c) Power                                              d) All
- 4) The Z transform of Discrete Time sequence  $x[n]$  is \_\_\_\_\_.  
 a)  $x[z] = \sum_{n=0}^{\infty} x[n].z^n$                       b)  $x[z] = x[n].z^n$   
 c)  $x[z] = \sum_{n=-\infty}^{\infty} x[n].z^{-n}$                       d)  $x[z] = \sum_{n=-\infty}^{\infty} x[n].z^n$
- 5) The signals  $x(t) = e^{-5t}$  \_\_\_\_\_.  
 a) Odd                                              b) Even  
 c) Neither odd nor even                      d) Both
- 6) Which mathematical notation specifies the condition of periodicity for a continuous time signal?  
 a)  $x(t) = x(t + T_0)$                       b)  $x(n) = x(n + N)$   
 c)  $x(t) = e^{-\alpha t}$                       d) None of the above
- 7) The signal  $x(t) = \sin 5t u(t)$  is \_\_\_\_\_.  
 a) Casual                                              b) Non casual  
 c) Anti-casual                                              d) None

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Set **R**

**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Signals and Systems**

Day & Date: Wednesday 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

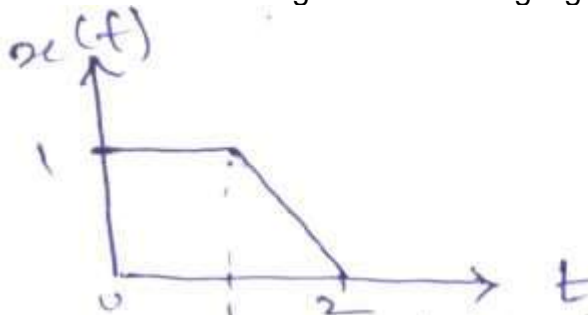
**Instructions:** 1) All questions are compulsory.  
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**Section – I**

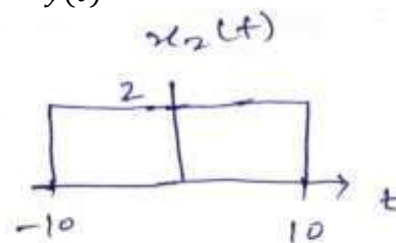
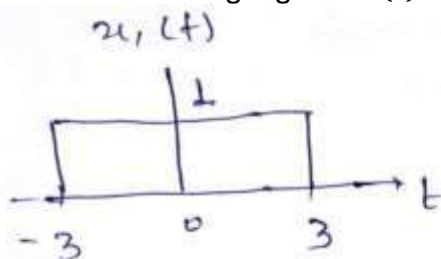
**Q.2 Solve Any Four**

16

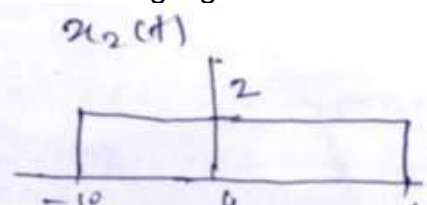
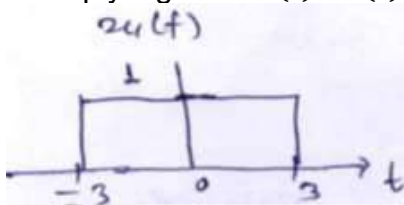
- a) Explain different types of signals.  
 b) Find Even and Odd signal for following signal



- c) Subtract following signal  $x_1(t) - x_2(t) = y(t)$



- d) Multiply signals  $x_1(t) \cdot x_2(t) = y(t)$  for following signal.

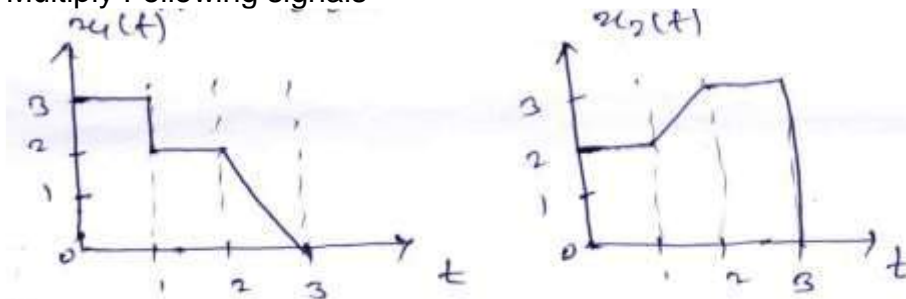


- e) Draw following Discrete time signal in Graphical form -  
 $x(-3) = -1, x(-2) = 2, x(-1) = 0, x(0) = 1, x(1) = 2, x(2) = 3, x(3) = 2$

12

**Q.3 Solve Any Two**

- a) Determine the power and energy of the signal  $A \sin(\omega_0 t + \varphi) = x(t)$   
 b) Multiply Following signals



- c) Check given signal is Linear or Non- Linear.

$$\frac{d^2 y(+)}{dt^2} + 3ty(t) = t^2 x(t)$$

**Section – II****Q.4 Solve Any Four**

16

- a) Explain following properties for Continuous Time Fourier Transform.  
 i) Linearity  
 ii) Frequency shifting  
 iii) Time shifting  
 iv) Time scaling  
 b) Find magnitude and phase spectrum for  $x(t) = \delta(t)$   
 c) Find Z transform and ROC for signal  $x[n] = b^n u[-n - 1]$   
 d) Explain Linearity and Time shifting Property for Z transform  
 e) Give the Property of Region of Conversion

**Q.5 Solve Any Two**

12

- a) Find Z transform & ROC of  $x[n] = \sin(\omega_0 n)u[n]$   
 b) Explain magnitude and phase spectrum for Fourier transform  
 c) Determine Fourier Transform of Gaussian pulse  $x(t) = e^{-b^2 t^2}$

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# ELECTRICAL ENGINEERING

Max. Marks: 70

3) Figures to the right indicates full marks.

## Marks:14

14

- Page 13 of 16

- 9) The Z transform of Discrete Time sequence  $x[n]$  is \_\_\_\_\_.  
 a)  $x[z] = \sum_{n=0}^{\infty} x[n].z^n$       b)  $x[z] = x[n].z^n$   
 c)  $x[z] = \sum_{n=-\infty}^{\infty} x[n].z^{-n}$       d)  $x[z] = \sum_{n=-\infty}^{\infty} x[n].z^n$
- 10) The signals  $x(t) = e^{-5t}$  \_\_\_\_\_.  
 a) Odd      b) Even  
 c) Neither odd nor even      d) Both
- 11) Which mathematical notation specifies the condition of periodicity for a continuous time signal?  
 a)  $x(t) = x(t + T_0)$       b)  $x(n) = x(n + N)$   
 c)  $x(t) = e^{-\alpha t}$       d) None of the above
- 12) The signal  $x(t) = \sin 5tu(t)$  is \_\_\_\_\_.  
 a) Casual      b) Non casual  
 c) Anti-casual      d) None
- 13) The systems  $y(t) = x(t - 4)$  is \_\_\_\_\_.  
 a) Static      b) Dynamic  
 c) Both a and b      d) None
- 14) The signal  $x(t) = \cos 3t$  is \_\_\_\_\_.  
 a) Causal      b) Non causal  
 c) Anti causal      d) None

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**T.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Signals and Systems**

Day & Date: Wednesday 22-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

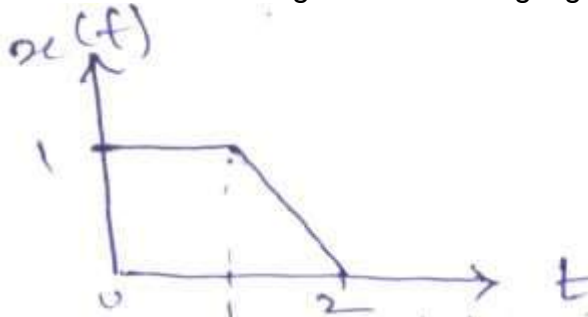
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

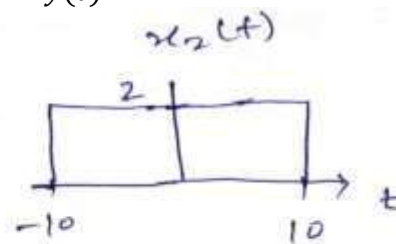
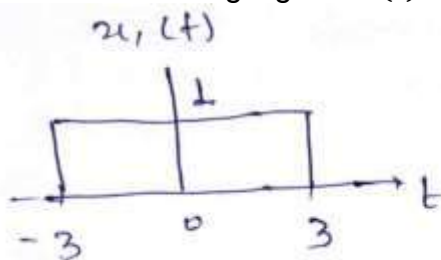
**Q.2 Solve Any Four**

**16**

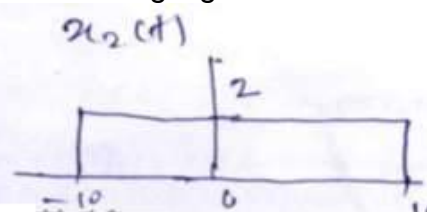
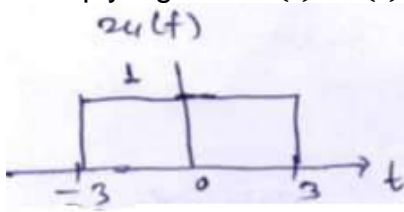
- a) Explain different types of signals.  
 b) Find Even and Odd signal for following signal



- c) Subtract following signal  $x_1(t) - x_2(t) = y(t)$



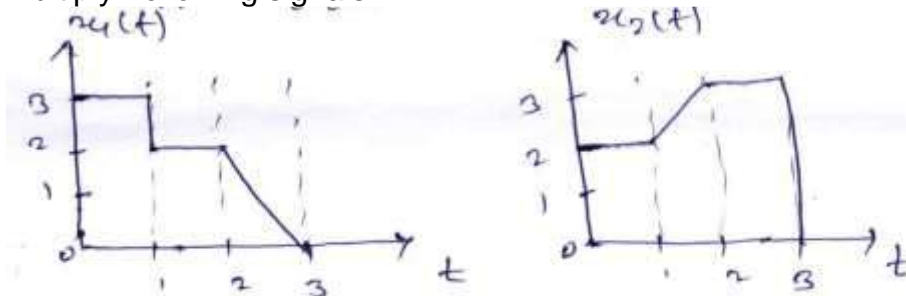
- d) Multiply signals  $x_1(t) \cdot x_2(t) = y(t)$  for following signal.



- e) Draw following Discrete time signal in Graphical form -  
 $x(-3) = -1, x(-2) = 2, x(-1) = 0, x(0) = 1, x(1) = 2, x(2) = 3, x(3) = 2$

**Q.3 Solve Any Two**

- a) Determine the power and energy of the signal  $A \sin(\omega_0 t + \varphi) = x(t)$   
 b) Multiply Following signals



- c) Check given signal is Linear or Non-Linear.

$$\frac{d^2 y(+)}{dt^2} + 3ty(t) = t^2 x(t)$$

**Section – II****Q.4 Solve Any Four**

- a) Explain following properties for Continuous Time Fourier Transform.  
 i) Linearity  
 ii) Frequency shifting  
 iii) Time shifting  
 iv) Time scaling  
 b) Find magnitude and phase spectrum for  $x(t) = \delta(t)$   
 c) Find Z transform and ROC for signal  $x[n] = b^n u[-n - 1]$   
 d) Explain Linearity and Time shifting Property for Z transform  
 e) Give the Property of Region of Conversion

**Q.5 Solve Any Two**

- a) Find Z transform & ROC of  $x[n] = \sin(\omega_0 n)u[n]$   
 b) Explain magnitude and phase spectrum for Fourier transform  
 c) Determine Fourier Transform of Gaussian pulse  $x(t) = e^{-b^2 t^2}$



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**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced control System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The right hand plane of s-plane, when mapped into z-plane
  - a) Covers the entire portion of inside of the unit circle
  - b) Covers the entire portion of Outside of the unit circle
  - c) It falls on the unit circle
  - d) It covers the entire portion except the unit circle
- 2) Lag compensation network normally consists of \_\_\_\_\_.
  - a) R and L elements
  - b) L and C elements
  - c) R and C elements
  - d) R, L and C elements
- 3) Leading compensator network is \_\_\_\_\_.
  - a) Equalizer
  - b) high pass filter
  - c) low pass filter
  - d) None of above
- 4) The transfer function of a lead compensator is  $G_C(s) = \frac{1+0.12s}{1+0.04s}$   
 The maximum phase shift that can be obtained from this compensator is \_\_\_\_\_.
  - a)  $60^\circ$
  - b)  $45^\circ$
  - c)  $30^\circ$
  - d)  $15^\circ$
- 5) \_\_\_\_\_ is used for improving both transient and steady state responses of the control system.
  - a) Integrator
  - b) Comparator
  - c) lag-lead compensator
  - d) None of these
- 6) In bode plot the gain cross over frequency is the frequency at which \_\_\_\_\_.
  - a)  $|(G(j\omega)H(j\omega))| = 1$
  - b)  $|(G(j\omega)H(j\omega))| = 0$
  - c)  $|(G(j\omega)H(j\omega))| = \infty$
  - d)  $\frac{1}{|(G(j\omega)H(j\omega))|} = K$
- 7) The system matrix of a discrete system is given by  $A = \begin{bmatrix} 0 & 1 \\ -3 & -5 \end{bmatrix}$ . The characteristic equation is given by
  - a)  $z^2 + 5z + 3 = 0$
  - b)  $z^2 - 3z - 5 = 0$
  - c)  $z^2 + 3z + 5 = 0$
  - d)  $z^2 + z + 2 = 0$

- Page 2 of 16

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| Set | P |
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**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced control System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- Explain realization of lag compensator.
- Consider the system having transfer function  $G(s) = k / s(s + 8)$  with unity feedback. Design a lead compensator to meet following specifications.
  - Damping ratio = 0.6
  - Natural frequency of oscillation  $\omega_n = 12$  rad/sec
  - $K_v \geq 10$
- Obtain state model for the system described in phase variable form.  

$$d^3y / d t^3 - 6 d^2y / d t^2 + 11 \frac{dy}{dt} + 6y + u(t) = 0$$
- Write the properties of state transition matrix.
- A system is represented by the following state and output equations find Transfer function of the system.

$$\dot{x}(t) = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} x(t) + \begin{bmatrix} 3 \\ 5 \end{bmatrix} U(t)$$

$$Y = [1 \quad 1] x(t)$$

**Q.3 Attempt any Two of the following question. 12**

- Obtain state Transition matrix whose system matrix is given by  $\begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$
- Test the controllability & observability of the system whose state space representation is given as

$$\dot{x}(t) = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} x(t) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} U(t)$$

$$Y = [1 \quad 2] x(t)$$

- Explain the Limitations of Transfer function Approach and advantages of state variable Analysis.

**Section – II**

**Q.4 Solve any four. 16**

- Explain common physical nonlinearities.
- Derive pulse transfer function of cascaded elements.
- Derive describing function of saturation.
- Determine the type of the singularity for the differential equation.  

$$y'' + 3y' + 2y = 0$$
- Explain Jump resonance phenomenon in nonlinear systems.

**Q.5 Solve any two.**

- a) Examine the stability of the system given by equation by Jury's test

$$Z^4 - 1.2 Z^3 + 0.07 Z^2 + 0.3 Z - 0.08 = 0$$

- b) Explain in short mapping between s-plane and z-plane.

- c) Consider the system  $\dot{x} = Ax, y = Cx$

$$A = \begin{bmatrix} -1 & 1 \\ 1 & 2 \end{bmatrix}$$

$$\text{And } C = [1 \quad 0]$$

Design a full order observer. The desired pole locations for the observer matrix are at -5, -5.

**Seat  
No.**

Max. Marks: 70

Marks: 14

1) The phase-lead network function  $G_C(s) = \frac{s + \frac{1}{T}}{s + \frac{1}{aT}}$ , where  $a < 1$  would

provide maximum phase –lead at a frequency of  $\omega_1$

- a)  $\frac{1}{T}$
- b)  $\frac{1}{aT}$
- c)  $\frac{1}{T\sqrt{a}}$
- d)  $\frac{1}{a\sqrt{T}}$

**2)** Observable matrix is given by

- $$\begin{array}{ll} \text{a)} & \begin{bmatrix} B \\ BA \\ \vdots \\ BA^{n-1} \end{bmatrix} \\ \text{b)} & \begin{bmatrix} A \\ AC \\ \vdots \\ AC^{n-1} \end{bmatrix} \\ \text{c)} & \begin{bmatrix} C \\ CA \\ \vdots \\ CA^{n-1} \end{bmatrix} \\ \text{d)} & \begin{bmatrix} D \\ DA \\ \vdots \\ DA^{n-1} \end{bmatrix} \end{array}$$

3) The state model of a linear time invariant system is given by  $\dot{X}(t) = AX(t) + BU(t)$  and  $Y(t) = CX(t) + DU(t)$ . The expression for transfer function of the system is \_\_\_\_\_.

- $C(sI - A)^{-1}BU(s) + D$
- $(sI - A)^{-1}BU(s) + D$
- $(sI - A)^{-1}BU(s)$
- $C(sI - A)^{-1}B$

4) Non-linearity caused by servo motor is \_\_\_\_\_.

- a) static friction                      b) back lash  
c) saturation                              d) none of these

- Page 6 of 16

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**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced control System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- Explain realization of lag compensator.
- Consider the system having transfer function  $G(s) = k / s(s + 8)$  with unity feedback. Design a lead compensator to meet following specifications.
  - Damping ratio = 0.6
  - Natural frequency of oscillation  $\omega_n = 12$  rad/sec
  - $K_v \geq 10$
- Obtain state model for the system described in phase variable form.  

$$d^3y / d t^3 - 6 d^2y / d t^2 + 11 \frac{dy}{dt} + 6y + u(t) = 0$$
- Write the properties of state transition matrix.
- A system is represented by the following state and output equations find Transfer function of the system.

$$\dot{x}(t) = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} x(t) + \begin{bmatrix} 3 \\ 5 \end{bmatrix} U(t)$$

$$Y = [1 \quad 1] x(t)$$

**Q.3 Attempt any Two of the following question. 12**

- Obtain state Transition matrix whose system matrix is given by  $\begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$
- Test the controllability & observability of the system whose state space representation is given as

$$\dot{x}(t) = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} x(t) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} U(t)$$

$$Y = [1 \quad 2] x(t)$$

- Explain the Limitations of Transfer function Approach and advantages of state variable Analysis.

**Section – II**

**Q.4 Solve any four. 16**

- Explain common physical nonlinearities.
- Derive pulse transfer function of cascaded elements.
- Derive describing function of saturation.
- Determine the type of the singularity for the differential equation.  

$$y'' + 3y' + 2y = 0$$
- Explain Jump resonance phenomenon in nonlinear systems.

**Q.5 Solve any two.**

- a) Examine the stability of the system given by equation by Jury's test

$$Z^4 - 1.2 Z^3 + 0.07 Z^2 + 0.3 Z - 0.08 = 0$$

- b) Explain in short mapping between s-plane and z-plane.

- c) Consider the system  $\dot{x} = Ax, y = Cx$

$$A = \begin{bmatrix} -1 & 1 \\ 1 & 2 \end{bmatrix}$$

$$\text{And } C = [1 \quad 0]$$

Design a full order observer. The desired pole locations for the observer matrix are at -5, -5.



**Seat  
No.**

| Set | R |
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Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

1) Non-linearity caused by servo motor is \_\_\_\_\_.

- a) static friction                      b) back lash  
c) saturation                          d) none of these
- In non-linear control system limit cycle is self-sustained oscillations of \_\_\_\_.
- a) Variable amplitude                      b) variable frequency  
c) fixed frequency                          d) fixed frequency and amplitude
- The information contained in a signal is preserved in the sampled version if \_\_\_\_.
- a)  $\omega_s = \omega_m$                           b)  $\omega_s = 0.5 \omega_m$   
c)  $\omega_s = 0.1 \omega_m$                       d)  $\omega_s \geq 2\omega_m$

4) The transfer function of zero order hold is \_\_\_\_\_.

- a)  $\frac{1 - e^{Ts}}{s}$       b)  $\frac{1 - e^{-Ts}}{s}$   
 c)  $\frac{1 - e^{Ts}}{s}$       d)  $\frac{1 - e^{-Ts}}{s}$

**5)** The right hand plane of s-plane, when mapped into z-plane

- a) Covers the entire portion of inside of the unit circle
- b) Covers the entire portion of Outside of the unit circle
- c) It falls on the unit circle
- d) It covers the entire portion except the unit circle

**6)** Lag compensation network normally consists of \_\_\_\_\_.

- a) R and L elements                      b) L and C elements  
c) R and C elements                      d) R, L and C elements

7) Leading compensator network is \_\_\_\_\_.

- a) Equalizer                      b) high pass filter  
c) low pass filter                d) None of above

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Set **R**

**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced control System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All questions are compulsory.

**Section – I****Q.2 Attempt any Four of the following question.****16**

- Explain realization of lag compensator.
- Consider the system having transfer function  $G(s) = k / s(s + 8)$  with unity feedback. Design a lead compensator to meet following specifications.
  - Damping ratio = 0.6
  - Natural frequency of oscillation  $\omega_n = 12$  rad/sec
  - $K_v \geq 10$
- Obtain state model for the system described in phase variable form.  

$$d^3y / d t^3 - 6 d^2y / d t^2 + 11 \frac{dy}{dt} + 6y + u(t) = 0$$
- Write the properties of state transition matrix.
- A system is represented by the following state and output equations find Transfer function of the system.

$$\dot{x}(t) = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} x(t) + \begin{bmatrix} 3 \\ 5 \end{bmatrix} U(t)$$

$$Y = [1 \quad 1] x(t)$$

**Q.3 Attempt any Two of the following question.****12**

- Obtain state Transition matrix whose system matrix is given by  $\begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$
- Test the controllability & observability of the system whose state space representation is given as

$$\dot{x}(t) = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} x(t) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} U(t)$$

$$Y = [1 \quad 2] x(t)$$

- Explain the Limitations of Transfer function Approach and advantages of state variable Analysis.

**Section – II****Q.4 Solve any four.****16**

- Explain common physical nonlinearities.
- Derive pulse transfer function of cascaded elements.
- Derive describing function of saturation.
- Determine the type of the singularity for the differential equation.  

$$y'' + 3y' + 2y = 0$$
- Explain Jump resonance phenomenon in nonlinear systems.

**Q.5 Solve any two.**

- a) Examine the stability of the system given by equation by Jury's test

$$Z^4 - 1.2 Z^3 + 0.07 Z^2 + 0.3 Z - 0.08 = 0$$

- b) Explain in short mapping between s-plane and z-plane.

- c) Consider the system  $\dot{x} = Ax, y = Cx$

$$A = \begin{bmatrix} -1 & 1 \\ 1 & 2 \end{bmatrix}$$

$$\text{And } C = [1 \quad 0]$$

Design a full order observer. The desired pole locations for the observer matrix are at -5, -5.

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**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced control System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) In bode plot the gain cross over frequency is the frequency at which \_\_\_\_.

- a)  $|(G(j\omega)H(j\omega))| = 1$       b)  $|(G(j\omega)H(j\omega))| = 0$   
 c)  $|(G(j\omega)H(j\omega))| = \infty$       d)  $\frac{1}{|(G(j\omega)H(j\omega))|} = K$

- 2) The system matrix of a discrete system is given by  $A = \begin{bmatrix} 0 & 1 \\ -3 & -5 \end{bmatrix}$ . The characteristic equation is given by

- a)  $z^2 + 5z + 3 = 0$       b)  $z^2 - 3z - 5 = 0$   
 c)  $z^2 + 3z + 5 = 0$       d)  $z^2 + z + 2 = 0$

- 3) The phase-lead network function  $G_C(s) = \frac{s + \frac{1}{T}}{s + \frac{1}{aT}}$ , where  $a < 1$  would provide maximum phase –lead at a frequency of

- a)  $\frac{1}{T}$       b)  $\frac{1}{aT}$   
 c)  $\frac{1}{T\sqrt{a}}$       d)  $\frac{1}{a\sqrt{T}}$

- 4) Observable matrix is given by

- a)  $\begin{bmatrix} B \\ BA \\ \vdots \\ BA^{n-1} \end{bmatrix}$       b)  $\begin{bmatrix} A \\ AC \\ \vdots \\ AC^{n-1} \end{bmatrix}$   
 c)  $\begin{bmatrix} C \\ CA \\ \vdots \\ CA^{n-1} \end{bmatrix}$       d)  $\begin{bmatrix} D \\ DA \\ \vdots \\ DA^{n-1} \end{bmatrix}$

- 5) The state model of a linear time invariant system is given by  $\dot{X}(t) = AX(t) + BU(t)$  and  $Y(t) = CX(t) + DU(t)$ . The expression for transfer function of the system is \_\_\_\_\_.  
 a)  $C(sI - A)^{-1}BU(s) + D$   
 b)  $(sI - A)^{-1}BU(s) + D$   
 c)  $(sI - A)^{-1}BU(s)$   
 d)  $C(sI - A)^{-1}B$
- 6) Non-linearity caused by servo motor is \_\_\_\_\_.  
 a) static friction  
 b) back lash  
 c) saturation  
 d) none of these
- 7) In non-linear control system limit cycle is self-sustained oscillations of \_\_\_\_\_.  
 a) Variable amplitude  
 b) variable frequency  
 c) fixed frequency  
 d) fixed frequency and amplitude
- 8) The information contained in a signal is preserved in the sampled version if \_\_\_\_\_.  
 a)  $\omega_s = \omega_m$   
 b)  $\omega_s = 0.5 \omega_m$   
 c)  $\omega_s = 0.1 \omega_m$   
 d)  $\omega_s \geq 2\omega_m$
- 9) The transfer function of zero order hold is \_\_\_\_\_.  
 a)  $1 - e^{Ts}$   
 b)  $1 - e^{-Ts}$   
 c)  $\frac{1 - e^{Ts}}{s}$   
 d)  $\frac{1 - e^{-Ts}}{s}$
- 10) The right hand plane of s-plane, when mapped into z-plane  
 a) Covers the entire portion of inside of the unit circle  
 b) Covers the entire portion of Outside of the unit circle  
 c) It falls on the unit circle  
 d) It covers the entire portion except the unit circle
- 11) Lag compensation network normally consists of \_\_\_\_\_.  
 a) R and L elements  
 b) L and C elements  
 c) R and C elements  
 d) R, L and C elements
- 12) Leading compensator network is \_\_\_\_\_.  
 a) Equalizer  
 b) high pass filter  
 c) low pass filter  
 d) None of above
- 13) The transfer function of a lead compensator is  $G_C(s) = \frac{1+0.12s}{1+0.04s}$   
 The maximum phase shift that can be obtained from this compensator is \_\_\_\_\_.  
 a)  $60^\circ$   
 b)  $45^\circ$   
 c)  $30^\circ$   
 d)  $15^\circ$
- 14) \_\_\_\_\_ is used for improving both transient and steady state responses of the control system.  
 a) Integrator  
 b) Comparator  
 c) lag-lead compensator  
 d) None of these

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Set **S**

**T. Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Advanced control System**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four of the following question. 16**

- Explain realization of lag compensator.
- Consider the system having transfer function  $G(s) = k / s(s + 8)$  with unity feedback. Design a lead compensator to meet following specifications.
  - Damping ratio = 0.6
  - Natural frequency of oscillation  $\omega_n = 12$  rad/sec
  - $K_v \geq 10$
- Obtain state model for the system described in phase variable form.  

$$d^3y / d t^3 - 6 d^2y / d t^2 + 11 \frac{dy}{dx} + 6y + u(t) = 0$$
- Write the properties of state transition matrix.
- A system is represented by the following state and output equations find Transfer function of the system.

$$\dot{x}(t) = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} x(t) + \begin{bmatrix} 3 \\ 5 \end{bmatrix} U(t)$$

$$Y = [1 \quad 1] x(t)$$

**Q.3 Attempt any Two of the following question. 12**

- Obtain state Transition matrix whose system matrix is given by  $\begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$
- Test the controllability & observability of the system whose state space representation is given as

$$\dot{x}(t) = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} x(t) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} U(t)$$

$$Y = [1 \quad 2] x(t)$$

- Explain the Limitations of Transfer function Approach and advantages of state variable Analysis.

**Section – II**

**Q.4 Solve any four. 16**

- Explain common physical nonlinearities.
- Derive pulse transfer function of cascaded elements.
- Derive describing function of saturation.
- Determine the type of the singularity for the differential equation.  

$$y'' + 3y' + 2y = 0$$
- Explain Jump resonance phenomenon in nonlinear systems.

**Q.5 Solve any two.**

- a) Examine the stability of the system given by equation by Jury's test

$$Z^4 - 1.2 Z^3 + 0.07 Z^2 + 0.3 Z - 0.08 = 0$$

- b) Explain in short mapping between s-plane and z-plane.

- c) Consider the system  $\dot{x} = Ax, y = Cx$

$$A = \begin{bmatrix} -1 & 1 \\ 1 & 2 \end{bmatrix}$$

$$\text{And } C = [1 \quad 0]$$

Design a full order observer. The desired pole locations for the observer matrix are at -5, -5.



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P

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Index grading may be achieved through the \_\_\_\_\_ of mobile ions across the core cladding interface within molten glass.
  - a) Doping
  - b) Diffusion
  - c) Separation
  - d) Combination
- 2) N.A is useful measure of
  - a) Light scattering ability
  - b) Dispersion
  - c) Attenuation
  - d) Light gathering capability
- 3) Multimode graded index fibers have \_\_\_\_\_ core diameters than multimode step index fibers.
  - a) Large
  - b) Varying
  - c) Smaller
  - d) Constant
- 4) Meridional ray is the ray which passes through \_\_\_\_\_ of the fiber core.
  - a) All angles
  - b) The axis
  - c) N.A.
  - d) Structure
- 5) The principle determining factor for the link designers to consider are the transmission distance, required bit rate and the \_\_\_\_\_.
  - a) Coupler
  - b) Fiber used
  - c) Data Rate
  - d) SNR
- 6) Electrical devices in optical network are basically used for \_\_\_\_\_.
  - a) Signal degradation
  - b) Node transfer
  - c) Signal control
  - d) Amplification
- 7) \_\_\_\_\_ is a multiplexing technique used to combine optical signals.
  - a) WDM
  - b) FDM
  - c) TDM
  - d) None of these

- 8) The rainbow pattern seen on a CD is an example of
  - a) Reflection
  - b) Refraction
  - c) Diffraction
  - d) None
- 9) OTDM stand for
  - a) Orthogonal Time Duplex Multiplexing
  - b) Orthogonal Time Division Multiplexing
  - c) Orthogonal Time Division Multiplexing
  - d) Optical Time Division Multiplexing
- 10) The requirement of detector is
  - a) High Fidelity
  - b) Large size
  - c) More N.A.
  - d) All
- 11) Impact ionization phenomenon occur in \_\_\_\_\_ Photodiode.
  - a) PN
  - b) Avalanche
  - c) PIN
  - d) None
- 12) LASER is \_\_\_\_\_ type of optical output power.
  - a) Coherent
  - b) Incoherent
  - c) Spontaneous type
  - d) Both a & b
- 13) Injection laser will generally supply \_\_\_\_\_ of optical output power.
  - a) Lower
  - b) Higher
  - c) Same
  - d) None
- 14) Attenuation per Km expressed in
  - a) Db per km
  - b) Ampere
  - c) Watt
  - d) None

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.

**SECTION – I**

**Q.2 Attempt any Four.** **16**

- a) Using simple ray theory, describe the mechanism for the transmission of light within an optical fiber.
- b) Explain the different type of rays in optical fiber.
- c) Explain intrinsic and extrinsic absorption mechanism in fiber optics.
- d) Explain the principle operation/concept of double heterojunction LED.
- e) With suitable sketches explain working principle of LASER.

**Q.3 Attempt any two.** **12**

- a) A long single mode optical fiber has an attenuation of  $0.5 \text{ dB km}^{-1}$  when operating at a wavelength of  $1.3 \mu\text{m}$ . The fiber core diameter is  $6\mu\text{m}$  and laser source bandwidth is 600 MHz. Compare the threshold optical powers for stimulated Brillouin and Raman scattering within the fiber at the wavelength specified.
- b) An optical fiber has a core refractive index of 1.50 and a cladding refractive index of 1.47 Determine a. Critical angle at the core cladding interface b. NA for the fiber c. Acceptance angle.
- c) Explain fiber alignment and joint loss with Fresnel reflection.

**SECTION – II**

**Q.4 Attempt any four.** **16**

- a) Explain Quantum Efficiency & Responsivity.
- b) Explain the principle of p-i-n photodiode.
- c) Write a short note on OTDM.
- d) Write a short note on Li-Fi
- e) Explain SONET and SDH networks.

**Q.5 Attempt any two.** **12**

- a) Explain in detail the receiver design for optical communication.
- b) Explain types of Optical Amplifiers.
- c) Explain the various parameters effecting the speed of response of detectors.

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The rainbow pattern seen on a CD is an example of
  - a) Reflection
  - b) Refraction
  - c) Diffraction
  - d) None
- 2) OTDM stand for
  - a) Orthogonal Time Duplex Multiplexing
  - b) Orthogonal Time Division Multiplexing
  - c) Orthogonal Time Division Multiplexing
  - d) Optical Time Division Multiplexing
- 3) The requirement of detector is
  - a) High Fidelity
  - b) Large size
  - c) More N.A.
  - d) All
- 4) Impact ionization phenomenon occur in \_\_\_\_\_ Photodiode.
  - a) PN
  - b) Avalanche
  - c) PIN
  - d) None
- 5) LASER is \_\_\_\_\_ type of optical output power.
  - a) Coherent
  - b) Incoherent
  - c) Spontaneous type
  - d) Both a & b
- 6) Injection laser will generally supply \_\_\_\_\_ of optical output power.
  - a) Lower
  - b) Higher
  - c) Same
  - d) None
- 7) Attenuation per Km expressed in
  - a) Db per km
  - b) Ampere
  - c) Watt
  - d) None
- 8) Index grading may be achieved through the \_\_\_\_\_ of mobile ions across the core cladding interface within molten glass.
  - a) Doping
  - b) Diffusion
  - c) Separation
  - d) Combination

- 9) N.A is useful measure of  
a) Light scattering ability                      b) Dispersion  
c) Attenuation                                      d) Light gathering capability
- 10) Multimode graded index fibers have \_\_\_\_\_ core diameters than multimode step index fibers.  
a) Large                                              b) Varying  
c) Smaller                                          d) Constant
- 11) Meridional ray is the ray which passes through \_\_\_\_\_ of the fiber core.  
a) All angles                                      b) The axis  
c) N.A.                                              d) Structure
- 12) The principle determining factor for the link designers to consider are the transmission distance, required bit rate and the\_\_\_\_\_  
a) Coupler                                          b) Fiber used  
c) Data Rate                                      d) SNR
- 13) Electrical devices in optical network are basically used for\_\_\_\_\_  
a) Signal degradation                      b) Node transfer  
c) Signal control                              d) Amplification
- 14) \_\_\_\_\_ is a multiplexing technique used to combine optical signals.  
a) WDM                                          b) FDM  
c) TDM                                          d) None of these

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Set **Q**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Optical Communication**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.

**SECTION – I****Q.2 Attempt any Four. 16**

- Using simple ray theory, describe the mechanism for the transmission of light within an optical fiber.
- Explain the different type of rays in optical fiber.
- Explain intrinsic and extrinsic absorption mechanism in fiber optics.
- Explain the principle operation/concept of double heterojunction LED.
- With suitable sketches explain working principle of LASER.

**Q.3 Attempt any two. 12**

- A long single mode optical fiber has an attenuation of  $0.5 \text{ dB km}^{-1}$  when operating at a wavelength of  $1.3 \mu\text{m}$ . The fiber core diameter is  $6\mu\text{m}$  and laser source bandwidth is 600 MHz. Compare the threshold optical powers for stimulated Brillouin and Raman scattering within the fiber at the wavelength specified.
- An optical fiber has a core refractive index of 1.50 and a cladding refractive index of 1.47 Determinea. Critical angle at the core cladding interface b.NA for the fiberc. Acceptance angle.
- Explain fiber alignment and joint loss with Fresnel reflection.

**SECTION – II****Q.4 Attempt any four. 16**

- Explain Quantum Efficiency & Responsivity.
- Explain the principle of p-i-n photodiode.
- Write a short note on OTDM.
- Write a short note on Li-Fi
- Explain SONET and SDH networks.

**Q.5 Attempt any two. 12**

- Explain in detail the receiver design for optical communication.
- Explain types of Optical Amplifiers.
- Explain the various parameters effecting the speed of response of detectors.

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Impact ionization phenomenon occur in \_\_\_\_\_ Photodiode.
  - a) PN
  - b) Avalanche
  - c) PIN
  - d) None
- 2) LASER is \_\_\_\_\_ type of optical output power.
  - a) Coherent
  - b) Incoherent
  - c) Spontaneous type
  - d) Both a & b
- 3) Injection laser will generally supply \_\_\_\_\_ of optical output power.
  - a) Lower
  - b) Higher
  - c) Same
  - d) None
- 4) Attenuation per Km expressed in
  - a) Db per km
  - b) Ampere
  - c) Watt
  - d) None
- 5) Index grading may be achieved through the \_\_\_\_\_ of mobile ions across the core cladding interface within molten glass.
  - a) Doping
  - b) Diffusion
  - c) Separation
  - d) Combination
- 6) N.A is useful measure of
  - a) Light scattering ability
  - b) Dispersion
  - c) Attenuation
  - d) Light gathering capability
- 7) Multimode graded index fibers have \_\_\_\_\_ core diameters than multimode step index fibers.
  - a) Large
  - b) Varying
  - c) Smaller
  - d) Constant
- 8) Meridional ray is the ray which passes through \_\_\_\_\_ of the fiber core.
  - a) All angles
  - b) The axis
  - c) N.A.
  - d) Structure

- 9) The principle determining factor for the link designers to consider are the transmission distance, required bit rate and the\_\_\_\_\_
- a) Coupler
  - b) Fiber used
  - c) Data Rate
  - d) SNR
- 10) Electrical devices in optical network are basically used for\_\_\_\_\_
- a) Signal degradation
  - b) Node transfer
  - c) Signal control
  - d) Amplification
- 11) \_\_\_\_\_is a multiplexing technique used to combine optical signals.
- a) WDM
  - b) FDM
  - c) TDM
  - d) None of these
- 12) The rainbow pattern seen on a CD is an example of
- a) Reflection
  - b) Refraction
  - c) Diffraction
  - d) None
- 13) OTDM stand for
- a) Orthogonal Time Duplex Multiplexing
  - b) Orthogonal Time Division Multiplexing
  - c) Orthogonal Time Division Multiplexing
  - d) Optical Time Division Multiplexing
- 14) The requirement of detector is
- a) High Fidelity
  - b) Large size
  - c) More N.A.
  - d) All



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Set **R**

**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Optical Communication**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.

**SECTION – I****Q.2 Attempt any Four. 16**

- Using simple ray theory, describe the mechanism for the transmission of light within an optical fiber.
- Explain the different type of rays in optical fiber.
- Explain intrinsic and extrinsic absorption mechanism in fiber optics.
- Explain the principle operation/concept of double heterojunction LED.
- With suitable sketches explain working principle of LASER.

**Q.3 Attempt any two. 12**

- A long single mode optical fiber has an attenuation of  $0.5 \text{ dB km}^{-1}$  when operating at a wavelength of  $1.3 \mu\text{m}$ . The fiber core diameter is  $6 \mu\text{m}$  and laser source bandwidth is 600 MHz. Compare the threshold optical powers for stimulated Brillouin and Raman scattering within the fiber at the wavelength specified.
- An optical fiber has a core refractive index of 1.50 and a cladding refractive index of 1.47 Determinea. Critical angle at the core cladding interface b.NA for the fiberc. Acceptance angle.
- Explain fiber alignment and joint loss with Fresnel reflection.

**SECTION – II****Q.4 Attempt any four. 16**

- Explain Quantum Efficiency & Responsivity.
- Explain the principle of p-i-n photodiode.
- Write a short note on OTDM.
- Write a short note on Li-Fi
- Explain SONET and SDH networks.

**Q.5 Attempt any two. 12**

- Explain in detail the receiver design for optical communication.
- Explain types of Optical Amplifiers.
- Explain the various parameters effecting the speed of response of detectors.

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Optical Communication**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Electrical devices in optical network are basically used for \_\_\_\_\_  
 a) Signal degradation                      b) Node transfer  
 c) Signal control                              d) Amplification
- 2) \_\_\_\_\_ is a multiplexing technique used to combine optical signals.  
 a) WDM                                              b) FDM  
 c) TDM                                              d) None of these
- 3) The rainbow pattern seen on a CD is an example of  
 a) Reflection                                      b) Refraction  
 c) Diffraction                                      d) None
- 4) OTDM stand for  
 a) Orthogonal Time Duplex Multiplexing  
 b) Orthogonal Time Division Multiplexing  
 c) Orthogonal Time Division Multiplexing  
 d) Optical Time Division Multiplexing
- 5) The requirement of detector is  
 a) High Fidelity                                      b) Large size  
 c) More N.A.                                              d) All
- 6) Impact ionization phenomenon occur in \_\_\_\_\_ Photodiode.  
 a) PN                                                      b) Avalanche  
 c) PIN                                                      d) None
- 7) LASER is \_\_\_\_\_ type of optical output power.  
 a) Coherent                                              b) Incoherent  
 c) Spontaneous type                                      d) Both a & b
- 8) Injection laser will generally supply \_\_\_\_\_ of optical output power.  
 a) Lower                                                      b) Higher  
 c) Same                                                      d) None
- 9) Attenuation per Km expressed in  
 a) Db per km                                              b) Ampere  
 c) Watt                                                      d) None

- 10)** Index grading may be achieved through the \_\_\_\_\_ of mobile ions across the core cladding interface within molten glass.
- a) Doping
  - b) Diffusion
  - c) Separation
  - d) Combination
- 11)** N.A is useful measure of
- a) Light scattering ability
  - b) Dispersion
  - c) Attenuation
  - d) Light gathering capability
- 12)** Multimode graded index fibers have \_\_\_\_\_ core diameters than multimode step index fibers.
- a) Large
  - b) Varying
  - c) Smaller
  - d) Constant
- 13)** Meridional ray is the ray which passes through \_\_\_\_\_ of the fiber core.
- a) All angles
  - b) The axis
  - c) N.A.
  - d) Structure
- 14)** The principle determining factor for the link designers to consider are the transmission distance, required bit rate and the\_\_\_\_\_
- a) Coupler
  - b) Fiber used
  - c) Data Rated
  - d) SNR

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**T.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Optical Communication**

Day &amp; Date: Friday, 24-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever needed and mention it clearly.

**SECTION – I****Q.2 Attempt any Four. 16**

- Using simple ray theory, describe the mechanism for the transmission of light within an optical fiber.
- Explain the different type of rays in optical fiber.
- Explain intrinsic and extrinsic absorption mechanism in fiber optics.
- Explain the principle operation/concept of double heterojunction LED.
- With suitable sketches explain working principle of LASER.

**Q.3 Attempt any two. 12**

- A long single mode optical fiber has an attenuation of  $0.5 \text{ dB km}^{-1}$  when operating at a wavelength of  $1.3 \mu\text{m}$ . The fiber core diameter is  $6 \mu\text{m}$  and laser source bandwidth is 600 MHz. Compare the threshold optical powers for stimulated Brillouin and Raman scattering within the fiber at the wavelength specified.
- An optical fiber has a core refractive index of 1.50 and a cladding refractive index of 1.47 Determine a. Critical angle at the core cladding interface b. NA for the fiber c. Acceptance angle.
- Explain fiber alignment and joint loss with Fresnel reflection.

**SECTION – II****Q.4 Attempt any four. 16**

- Explain Quantum Efficiency & Responsivity.
- Explain the principle of p-i-n photodiode.
- Write a short note on OTDM.
- Write a short note on Li-Fi
- Explain SONET and SDH networks.

**Q.5 Attempt any two. 12**

- Explain in detail the receiver design for optical communication.
- Explain types of Optical Amplifiers.
- Explain the various parameters effecting the speed of response of detectors.

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Solve All MCQ Questions.**

**14**

- 1) Dead zone of an instrument is \_\_\_\_\_.
  - a) The largest change of input quantity for which there is no output of the instrument.
  - b) The time required by an instrument to begin to respond to a change in measurand.
  - c) The unmeasured quantity which exceeds the maximum range of the instrument.
  - d) The time required by an instrument to warm up initial.
- 2) The sensors are classified on the basis of \_\_\_\_\_.
  - a) Functions
  - b) Performance
  - c) Output
  - d) All of the above
- 3) Which of the following represents the output of Hall Effect transducer?
  - a) Hall potential
  - b) Emf
  - c) Applied voltage
  - d) Lorentz Voltage
- 4) Piezoelectric effect is when materials produce electric charges when \_\_\_\_\_.
  - a) Voltage is applied
  - b) Mechanical Stress is applied
  - c) Electric field is applied
  - d) Magnetic field is applied
- 5) The smallest change which a sensor can detect is termed \_\_\_\_\_.
  - a) Accuracy
  - b) Precision
  - c) Resolution
  - d) Scale
- 6) What is signal conditioning?
  - a) To analyse any signal
  - b) Conversion or modification is referred to as conditioning
  - c) Conversion from analog to digital is signal conditioning
  - d) Conversion from digital to analog is signal conditioning



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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt Any Four** **16**

- 1) Define and explain the sensor with one example.
- 2) Explain the principle of working of Hall effect sensor.
- 3) State and explain the methods of data transmission.
- 4) Explain with neat sketch thermal expansion property of material.
- 5) What is a voltage follower? Give a practical use of a voltage follower.
- 6) Give classification of sensor and explain active and passive sensor.

**Q.3 Attempt Any Two** **12**

- 1) Define the temperature and explain the thermal properties of material.
- 2) State characteristics of sensor and explain the transfer function characteristics.
- 3) Explain the basic concept of analog to digital converter. Also explain the V/F Analog to digital converter.

**Section – II**

**Q.4 Attempt Any Four** **16**

- 1) State the different types of pressure sensor and explain any one of them.
- 2) State the different types of temperature sensor and explain any one of them.
- 3) With neat sketch explain spin casting method of surface processing.
- 4) Explain the wet etching MEMS Technology.
- 5) State and explain the principle of operation of Electrical actuators.
- 6) Write the Selection criteria of Actuators.

**Q.5 Attempt Any Two** **12**

- 1) State the sensors used for Velocity and Acceleration application and explain any one of them.
- 2) State the different types of material used for fabrication of sensor and explain any one of them.
- 3) State and explain the principle of operation of micro and nano actuator with advantages and disadvantages.

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Solve All MCQ Questions.**

**14**

- 1) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.  
 a) Mutual Inductance  
 b) Self Inductance  
 c) Variable Resistance Transduction  
 d) Hall Effect
- 2) Proximity sensor is a \_\_\_\_\_ type of position sensor.  
 a) Contact  
 b) Non - contact  
 c) Eddy current  
 d) Resistive
- 3) In wet etching material is removed by \_\_\_\_\_.  
 a) Absorption  
 b) Sublimation  
 c) Chemical reaction  
 d) The force exerted due to flow of solvent
- 4) What is the main principle of electroplating?  
 a) Hydrolysis  
 b) Neutralization  
 c) Esterification  
 d) Saturation
- 5) The force developed in hydraulic systems is high due to \_\_\_\_\_.  
 a) High pressure  
 b) More oil  
 c) Less pressure  
 d) Less oil
- 6) In which type of system does power transmission takes place through compressed air?  
 a) Fluid power system  
 b) Hydraulic system  
 c) Pneumatic system  
 d) stepper motors
- 7) The direction control valve controls \_\_\_\_\_.  
 a) Direction of flow  
 b) Rate of flow  
 c) Moisture  
 d) Force and motion



- 8) Dead zone of an instrument is \_\_\_\_\_.  
a) The largest change of input quantity for which there is no output of the instrument.  
b) The time required by an instrument to begin to respond to a change in measurand.  
c) The unmeasured quantity which exceeds the maximum range of the instrument.  
d) The time required by an instrument to warm up initial.
- 9) The sensors are classified on the basis of \_\_\_\_\_.  
a) Functions  
b) Performance  
c) Output  
d) All of the above
- 10) Which of the following represents the output of Hall Effect transducer?  
a) Hall potential  
b) Emf  
c) Applied voltage  
d) Lorentz Voltage
- 11) Piezoelectric effect is when materials produce electric charges when \_\_\_\_\_.  
a) Voltage is applied  
b) Mechanical Stress is applied  
c) Electric field is applied  
d) Magnetic field is applied
- 12) The smallest change which a sensor can detect is termed \_\_\_\_\_.  
a) Accuracy  
b) Precision  
c) Resolution  
d) Scale
- 13) What is signal conditioning?  
a) To analyse any signal  
b) Conversion or modification is referred to as conditioning  
c) Conversion from analog to digital is signal conditioning  
d) Conversion from digital to analog is signal conditioning
- 14) Dynamic range of ADC is depended on \_\_\_\_\_.  
a) Resolution  
b) Linearity  
c) Accuracy  
d) All of the mentioned

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt Any Four** **16**

- 1) Define and explain the sensor with one example.
- 2) Explain the principle of working of Hall effect sensor.
- 3) State and explain the methods of data transmission.
- 4) Explain with neat sketch thermal expansion property of material.
- 5) What is a voltage follower? Give a practical use of a voltage follower.
- 6) Give classification of sensor and explain active and passive sensor.

**Q.3 Attempt Any Two** **12**

- 1) Define the temperature and explain the thermal properties of material.
- 2) State characteristics of sensor and explain the transfer function characteristics.
- 3) Explain the basic concept of analog to digital converter. Also explain the V/F Analog to digital converter.

**Section – II**

**Q.4 Attempt Any Four** **16**

- 1) State the different types of pressure sensor and explain any one of them.
- 2) State the different types of temperature sensor and explain any one of them.
- 3) With neat sketch explain spin casting method of surface processing.
- 4) Explain the wet etching MEMS Technology.
- 5) State and explain the principle of operation of Electrical actuators.
- 6) Write the Selection criteria of Actuators.

**Q.5 Attempt Any Two** **12**

- 1) State the sensors used for Velocity and Acceleration application and explain any one of them.
- 2) State the different types of material used for fabrication of sensor and explain any one of them.
- 3) State and explain the principle of operation of micro and nano actuator with advantages and disadvantages.

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Solve All MCQ Questions.**

**14**

- 1) What is the main principle of electroplating?
  - a) Hydrolysis
  - b) Neutralization
  - c) Esterification
  - d) Saturation
- 2) The force developed in hydraulic systems is high due to \_\_\_\_\_.
  - a) High pressure
  - b) More oil
  - c) Less pressure
  - d) Less oil
- 3) In which type of system does power transmission takes place through compressed air?
  - a) Fluid power system
  - b) Hydraulic system
  - c) Pneumatic system
  - d) stepper motors
- 4) The direction control valve controls \_\_\_\_\_.
  - a) Direction of flow
  - b) Rate of flow
  - c) Moisture
  - d) Force and motion
- 5) Dead zone of an instrument is \_\_\_\_\_.
  - a) The largest change of input quantity for which there is no output of the instrument.
  - b) The time required by an instrument to begin to respond to a change in measurand.
  - c) The unmeasured quantity which exceeds the maximum range of the instrument.
  - d) The time required by an instrument to warm up initial.
- 6) The sensors are classified on the basis of \_\_\_\_\_.
  - a) Functions
  - b) Performance
  - c) Output
  - d) All of the above
- 7) Which of the following represents the output of Hall Effect transducer?
  - a) Hall potential
  - b) Emf
  - c) Applied voltage
  - d) Lorentz Voltage

- 8) Piezoelectric effect is when materials produce electric charges when \_\_\_\_\_.  
a) Voltage is applied                      b) Mechanical Stress is applied  
c) Electric field is applied                d) Magnetic field is applied
- 9) The smallest change which a sensor can detect is termed \_\_\_\_\_.  
a) Accuracy                                    b) Precision  
c) Resolution                                  d) Scale
- 10) What is signal conditioning?  
a) To analyse any signal  
b) Conversion or modification is referred to as conditioning  
c) Conversion from analog to digital is signal conditioning  
d) Conversion from digital to analog is signal conditioning
- 11) Dynamic range of ADC is depended on \_\_\_\_\_.  
a) Resolution                                  b) Linearity  
c) Accuracy                                    d) All of the mentioned
- 12) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.  
a) Mutual Inductance  
b) Self Inductance  
c) Variable Resistance Transduction  
d) Hall Effect
- 13) Proximity sensor is a \_\_\_\_\_ type of position sensor.  
a) Contact                                        b) Non - contact  
c) Eddy current                                d) Resistive
- 14) In wet etching material is removed by \_\_\_\_\_.  
a) Absorption                                  b) Sublimation  
c) Chemical reaction                        d) The force exerted due to flow of solvent

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt Any Four** **16**

- 1) Define and explain the sensor with one example.
- 2) Explain the principle of working of Hall effect sensor.
- 3) State and explain the methods of data transmission.
- 4) Explain with neat sketch thermal expansion property of material.
- 5) What is a voltage follower? Give a practical use of a voltage follower.
- 6) Give classification of sensor and explain active and passive sensor.

**Q.3 Attempt Any Two** **12**

- 1) Define the temperature and explain the thermal properties of material.
- 2) State characteristics of sensor and explain the transfer function characteristics.
- 3) Explain the basic concept of analog to digital converter. Also explain the V/F Analog to digital converter.

**Section – II**

**Q.4 Attempt Any Four** **16**

- 1) State the different types of pressure sensor and explain any one of them.
- 2) State the different types of temperature sensor and explain any one of them.
- 3) With neat sketch explain spin casting method of surface processing.
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- 5) State and explain the principle of operation of Electrical actuators.
- 6) Write the Selection criteria of Actuators.

**Q.5 Attempt Any Two** **12**

- 1) State the sensors used for Velocity and Acceleration application and explain any one of them.
- 2) State the different types of material used for fabrication of sensor and explain any one of them.
- 3) State and explain the principle of operation of micro and nano actuator with advantages and disadvantages.

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Solve All MCQ Questions.**

**14**

- 1) What is signal conditioning?
  - a) To analyse any signal
  - b) Conversion or modification is referred to as conditioning
  - c) Conversion from analog to digital is signal conditioning
  - d) Conversion from digital to analog is signal conditioning
- 2) Dynamic range of ADC is depended on \_\_\_\_\_.
  - a) Resolution
  - b) Linearity
  - c) Accuracy
  - d) All of the mentioned
- 3) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.
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  - c) Variable Resistance Transduction
  - d) Hall Effect
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  - b) Non - contact
  - c) Eddy current
  - d) Resistive
- 5) In wet etching material is removed by \_\_\_\_\_.
  - a) Absorption
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  - c) Chemical reaction
  - d) The force exerted due to flow of solvent
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  - a) High pressure
  - b) More oil
  - c) Less pressure
  - d) Less oil
- 8) In which type of system does power transmission takes place through compressed air?
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- 9) The direction control valve controls \_\_\_\_\_.  
a) Direction of flow  
b) Rate of flow  
c) Moisture  
d) Force and motion
- 10) Dead zone of an instrument is \_\_\_\_\_.  
a) The largest change of input quantity for which there is no output of the instrument.  
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b) Performance  
c) Output  
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- 12) Which of the following represents the output of Hall Effect transducer?  
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c) Applied voltage  
d) Lorentz Voltage
- 13) Piezoelectric effect is when materials produce electric charges when \_\_\_\_\_.  
a) Voltage is applied  
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c) Electric field is applied  
d) Magnetic field is applied
- 14) The smallest change which a sensor can detect is termed \_\_\_\_\_.  
a) Accuracy  
b) Precision  
c) Resolution  
d) Scale

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**T.Y. (B.Tech.) (Sem – II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Sensors & Applications**

Day & Date: Friday, 24-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt Any Four** **16**

- 1) Define and explain the sensor with one example.
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**Q.3 Attempt Any Two** **12**

- 1) Define the temperature and explain the thermal properties of material.
- 2) State characteristics of sensor and explain the transfer function characteristics.
- 3) Explain the basic concept of analog to digital converter. Also explain the V/F Analog to digital converter.

**Section – II**

**Q.4 Attempt Any Four** **16**

- 1) State the different types of pressure sensor and explain any one of them.
- 2) State the different types of temperature sensor and explain any one of them.
- 3) With neat sketch explain spin casting method of surface processing.
- 4) Explain the wet etching MEMS Technology.
- 5) State and explain the principle of operation of Electrical actuators.
- 6) Write the Selection criteria of Actuators.

**Q.5 Attempt Any Two** **12**

- 1) State the sensors used for Velocity and Acceleration application and explain any one of them.
- 2) State the different types of material used for fabrication of sensor and explain any one of them.
- 3) State and explain the principle of operation of micro and nano actuator with advantages and disadvantages.



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Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks: 10

10

- Page 1 of 12

- 8) Construction of BLDC is exactly similar to the \_\_\_\_\_
- a) Conventional DC motor
  - b) Induction motor
  - c) Permanent magnet synchronous motor
  - d) Totally different construction
- 9) Typical brush less motor doesn't have \_\_\_\_\_
- a) Commutator
  - b) Permanent magnet
  - c) Electronic controller
  - d) Fixed armature
- 10) BLDC can be used instead \_\_\_\_\_
- a) Synchronous motor
  - b) Normal brushed DC motor
  - c) Induction motor
  - d) Air motor

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Special Purpose Machines**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FOUR questions from Q.No.2.  
2) Figures to the right indicate full marks.

**Q.2 Attempt any Four.**

**40**

- a) Explain with phasor diagram torque speed characteristics of synchronous reluctance motor.
- b) Explain with neat sketch Constructional feature, Principle of operation permanent magnet DC Motor.
- c) Explain with neat sketch operation of single stack variable reluctance stepper motor.
- d) Derive voltage and torque equation of switched reluctance motor.
- e) Explain with neat sketch static and dynamic characteristics of stepper motor.
- f) Explain with neat sketch construction and operating principle of synchronous reluctance motor.

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Special Purpose Machines**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which of the following is not an advantage of BLDC motor over conventional DC motor?
 

|                         |              |
|-------------------------|--------------|
| a) Less maintenance     | b) Long life |
| c) No risk of explosion | d) Low cost  |
- 2) In BLDC motor driver module, we do not require \_\_\_\_\_.
 

|         |                      |
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| a) SCRs | b) Power transistors |
| c) FETs | d) Transistors       |
- 3) Construction of BLDC is exactly similar to the \_\_\_\_\_.
 

|                                       |
|---------------------------------------|
| a) Conventional DC motor              |
| b) Induction motor                    |
| c) Permanent magnet synchronous motor |
| d) Totally different construction     |
- 4) Typical brush less motor doesn't have \_\_\_\_\_.
 

|                          |                     |
|--------------------------|---------------------|
| a) Commutator            | b) Permanent magnet |
| c) Electronic controller | d) Fixed armature   |
- 5) BLDC can be used instead \_\_\_\_\_.
 

|                      |                            |
|----------------------|----------------------------|
| a) Synchronous motor | b) Normal brushed DC motor |
| c) Induction motor   | d) Air motor               |
- 6) In a three-stack 12/8-pole VR motor, the rotor pole pitch is \_\_\_\_\_.
 

|        |        |
|--------|--------|
| a) 15° | b) 30° |
| c) 45° | d) 60° |
- 7) For a reluctance motor, the maximum average torque occurs when  $\delta =$  \_\_\_\_
 

|        |         |
|--------|---------|
| a) 45° | b) 90°  |
| c) 0°  | d) 180° |
- 8) If a hybrid stepper motor has a rotor pitch of 36° and a step angle of 9°, the number of its phases must be \_\_\_\_\_.
 

|      |      |
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| a) 4 | b) 2 |
| c) 3 | d) 6 |

- 9)** Reluctance motor can produce torque at \_\_\_\_\_
- a) any speed less than synchronous speed
  - b) synchronous speed only
  - c) any speed greater than synchronous speed
  - d) any of the mentioned
- 10)** A stepper motor may be considered as a \_\_\_\_\_ converter.
- a) Dc to dc
  - b) Ac to ac
  - c) Dc to ac
  - d) Digital-to-analogue

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Special Purpose Machines**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FOUR questions from Q.No.2.  
2) Figures to the right indicate full marks.

**Q.2 Attempt any Four.**

**40**

- a) Explain with phasor diagram torque speed characteristics of synchronous reluctance motor.
- b) Explain with neat sketch Constructional feature, Principle of operation permanent magnet DC Motor.
- c) Explain with neat sketch operation of single stack variable reluctance stepper motor.
- d) Derive voltage and torque equation of switched reluctance motor.
- e) Explain with neat sketch static and dynamic characteristics of stepper motor.
- f) Explain with neat sketch construction and operating principle of synchronous reluctance motor.

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Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks: 10

10

- Page 7 of 12

- 10)** Construction of BLDC is exactly similar to the \_\_\_\_\_
- a) Conventional DC motor
  - b) Induction motor
  - c) Permanent magnet synchronous motor
  - d) Totally different construction



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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Special Purpose Machines**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FOUR questions from Q.No.2.  
2) Figures to the right indicate full marks.

**Q.2 Attempt any Four.**

**40**

- a) Explain with phasor diagram torque speed characteristics of synchronous reluctance motor.
- b) Explain with neat sketch Constructional feature, Principle of operation permanent magnet DC Motor.
- c) Explain with neat sketch operation of single stack variable reluctance stepper motor.
- d) Derive voltage and torque equation of switched reluctance motor.
- e) Explain with neat sketch static and dynamic characteristics of stepper motor.
- f) Explain with neat sketch construction and operating principle of synchronous reluctance motor.

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Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicate full marks.

Marks: 10

## 10

- Page 10 of 12

- 9)** In a three-stack 12/8-pole VR motor, the rotor pole pitch is \_\_\_\_\_
- |               |               |
|---------------|---------------|
| a) $15^\circ$ | b) $30^\circ$ |
| c) $45^\circ$ | d) $60^\circ$ |
- 10)** For a reluctance motor, the maximum average torque occurs when  $\delta =$ \_\_
- |               |                |
|---------------|----------------|
| a) $45^\circ$ | b) $90^\circ$  |
| c) $0^\circ$  | d) $180^\circ$ |

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Special Purpose Machines**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FOUR questions from Q.No.2.  
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**40**

- a) Explain with phasor diagram torque speed characteristics of synchronous reluctance motor.
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- e) Explain with neat sketch static and dynamic characteristics of stepper motor.
- f) Explain with neat sketch construction and operating principle of synchronous reluctance motor.

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Safety**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No.1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) If electric wires and appliances are overheated due to high voltage of electric current, they can
 

|               |                 |
|---------------|-----------------|
| a) catch fire | b) burn         |
| c) freeze     | d) both a and b |
- 2) Do not use appliances, if
 

|                     |                  |
|---------------------|------------------|
| a) damaged          | b) wires exposed |
| c) working properly | d) both a and b  |
- 3) A short thin piece of wire which is heated up and melt by the flowing of electric current in it, is called
 

|            |             |
|------------|-------------|
| a) circuit | b) fuse     |
| c) cell    | d) resistor |
- 4) Electricity flows through any
 

|              |                    |
|--------------|--------------------|
| a) material  | b) insulator       |
| c) conductor | d) state of matter |
- 5) Safety Electrical One Line Diagram should be used to \_\_\_\_\_ all sources of electrical energy.
 

|             |              |
|-------------|--------------|
| a) Identify | b) Castigate |
| c) Evaluate | d) Modify    |
- 6) Work performed on an electrical system within reaching distance of energized components is \_\_\_\_\_ work.
 

|              |                |
|--------------|----------------|
| a) Energized | b) Essential   |
| c) Safe      | d) Unavoidable |
- 7) The secondary of a current transformer must never be \_\_\_\_\_ while energized.
 

|             |              |
|-------------|--------------|
| a) Grounded | b) Opened    |
| c) Examined | d) Shortened |
- 8) One of the three generally recognized hazards of electrical work is \_\_\_\_\_
 

|          |               |
|----------|---------------|
| a) Arc   | b) Cuts       |
| c) Falls | d) Concussion |

- 9)** Electrical injuries are commonly caused by:
- a) Unsafe equipment or installations
  - b) An unsafe environment
  - c) Unsafe work practices
  - d) All of the above
- 10)** A person qualified to perform electrical work must possess:
- a) Skills/techniques to distinguish live parts from other parts of electrical equipment.
  - b) Skills and techniques to determine the normal voltage of exposed live parts.
  - c) Knowledge on the use of PPE, insulating and shielding materials and insulated tools.
  - d) All of the above

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Safety**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any FIVE questions from Q.No.2.  
2) Figures to the right indicate full marks

**Q.2 Attempt any FIVE.**

**40**

- 1) Write the safety precautions to be taken during the operation and maintenance of electrical equipment.
- 2) Explain in brief types of fire extinguisher.
- 3) State and explain method of artificial respiration.
- 4) Explain the effect of electrical shock on human body.
- 5) Explain the procedure of permit to do the work on electrical equipment.
- 6) State safety procedure during erection phase, commissioning phase and maintenance phase.

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Safety**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No.1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Work performed on an electrical system within reaching distance of energized components is \_\_\_\_\_ work.
 

|              |                |
|--------------|----------------|
| a) Energized | b) Essential   |
| c) Safe      | d) Unavoidable |
- 2) The secondary of a current transformer must never be \_\_\_\_\_ while energized.
 

|             |              |
|-------------|--------------|
| a) Grounded | b) Opened    |
| c) Examined | d) Shortened |
- 3) One of the three generally recognized hazards of electrical work is \_\_\_\_\_.
 

|          |               |
|----------|---------------|
| a) Arc   | b) Cuts       |
| c) Falls | d) Concussion |
- 4) Electrical injuries are commonly caused by:
 

|                                      |
|--------------------------------------|
| a) Unsafe equipment or installations |
| b) An unsafe environment             |
| c) Unsafe work practices             |
| d) All of the above                  |
- 5) A person qualified to perform electrical work must possess:
 

|                                                                                          |
|------------------------------------------------------------------------------------------|
| a) Skills/techniques to distinguish live parts from other parts of electrical equipment. |
| b) Skills and techniques to determine the normal voltage of exposed live parts.          |
| c) Knowledge on the use of PPE, insulating and shielding materials and insulated tools.  |
| d) All of the above                                                                      |
- 6) If electric wires and appliances are overheated due to high voltage of electric current, they can
 

|               |                 |
|---------------|-----------------|
| a) catch fire | b) burn         |
| c) freeze     | d) both a and b |
- 7) Do not use appliances, if
 

|                     |                  |
|---------------------|------------------|
| a) damaged          | b) wires exposed |
| c) working properly | d) both a and b  |



- 8)** A short thin piece of wire which is heated up and melt by the flowing of electric current in it, is called
- |            |             |
|------------|-------------|
| a) circuit | b) fuse     |
| c) cell    | d) resistor |
- 9)** Electricity flows through any
- |              |                    |
|--------------|--------------------|
| a) material  | b) insulator       |
| c) conductor | d) state of matter |
- 10)** Safety Electrical One Line Diagram should be used to \_\_\_\_\_ all sources of electrical energy.
- |             |              |
|-------------|--------------|
| a) Identify | b) Castigate |
| c) Evaluate | d) Modify    |

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Safety**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any FIVE questions from Q.No.2.

2) Figures to the right indicate full marks

**Q.2 Attempt any FIVE.**

**40**

- 1) Write the safety precautions to be taken during the operation and maintenance of electrical equipment.
- 2) Explain in brief types of fire extinguisher.
- 3) State and explain method of artificial respiration.
- 4) Explain the effect of electrical shock on human body.
- 5) Explain the procedure of permit to do the work on electrical equipment.
- 6) State safety procedure during erection phase, commissioning phase and maintenance phase.

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Safety**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No.1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Electrical injuries are commonly caused by:
  - a) Unsafe equipment or installations
  - b) An unsafe environment
  - c) Unsafe work practices
  - d) All of the above
- 2) A person qualified to perform electrical work must possess:
  - a) Skills/techniques to distinguish live parts from other parts of electrical equipment.
  - b) Skills and techniques to determine the normal voltage of exposed live parts.
  - c) Knowledge on the use of PPE, insulating and shielding materials and insulated tools.
  - d) All of the above
- 3) If electric wires and appliances are overheated due to high voltage of electric current, they can
 

|               |                 |
|---------------|-----------------|
| a) catch fire | b) burn         |
| c) freeze     | d) both a and b |
- 4) Do not use appliances, if
 

|                     |                  |
|---------------------|------------------|
| a) damaged          | b) wires exposed |
| c) working properly | d) both a and b  |
- 5) A short thin piece of wire which is heated up and melt by the flowing of electric current in it, is called
 

|            |             |
|------------|-------------|
| a) circuit | b) fuse     |
| c) cell    | d) resistor |
- 6) Electricity flows through any
 

|              |                    |
|--------------|--------------------|
| a) material  | b) insulator       |
| c) conductor | d) state of matter |
- 7) Safety Electrical One Line Diagram should be used to \_\_\_\_\_ all sources of electrical energy.
 

|             |              |
|-------------|--------------|
| a) Identify | b) Castigate |
| c) Evaluate | d) Modify    |

- 8)** Work performed on an electrical system within reaching distance of energized components is \_\_\_\_\_ work.
- |              |                |
|--------------|----------------|
| a) Energized | b) Essential   |
| c) Safe      | d) Unavoidable |
- 9)** The secondary of a current transformer must never be \_\_\_\_\_ while energized.
- |             |              |
|-------------|--------------|
| a) Grounded | b) Opened    |
| c) Examined | d) Shortened |
- 10)** One of the three generally recognized hazards of electrical work is \_\_\_\_\_
- |          |               |
|----------|---------------|
| a) Arc   | b) Cuts       |
| c) Falls | d) Concussion |

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Safety**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any FIVE questions from Q.No.2.  
2) Figures to the right indicate full marks

**Q.2 Attempt any FIVE.**

**40**

- 1) Write the safety precautions to be taken during the operation and maintenance of electrical equipment.
- 2) Explain in brief types of fire extinguisher.
- 3) State and explain method of artificial respiration.
- 4) Explain the effect of electrical shock on human body.
- 5) Explain the procedure of permit to do the work on electrical equipment.
- 6) State safety procedure during erection phase, commissioning phase and maintenance phase.

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Safety**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No.1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options. 10**

- 1) A short thin piece of wire which is heated up and melt by the flowing of electric current in it, is called
 

|            |             |
|------------|-------------|
| a) circuit | b) fuse     |
| c) cell    | d) resistor |
- 2) Electricity flows through any
 

|              |                    |
|--------------|--------------------|
| a) material  | b) insulator       |
| c) conductor | d) state of matter |
- 3) Safety Electrical One Line Diagram should be used to \_\_\_\_\_ all sources of electrical energy.
 

|             |              |
|-------------|--------------|
| a) Identify | b) Castigate |
| c) Evaluate | d) Modify    |
- 4) Work performed on an electrical system within reaching distance of energized components is \_\_\_\_\_ work.
 

|              |                |
|--------------|----------------|
| a) Energized | b) Essential   |
| c) Safe      | d) Unavoidable |
- 5) The secondary of a current transformer must never be \_\_\_\_\_ while energized.
 

|             |              |
|-------------|--------------|
| a) Grounded | b) Opened    |
| c) Examined | d) Shortened |
- 6) One of the three generally recognized hazards of electrical work is \_\_\_\_\_.
 

|          |               |
|----------|---------------|
| a) Arc   | b) Cuts       |
| c) Falls | d) Concussion |
- 7) Electrical injuries are commonly caused by:
 

|                                      |
|--------------------------------------|
| a) Unsafe equipment or installations |
| b) An unsafe environment             |
| c) Unsafe work practices             |
| d) All of the above                  |

- 8)** A person qualified to perform electrical work must possess:
- a) Skills/techniques to distinguish live parts from other parts of electrical equipment.
  - b) Skills and techniques to determine the normal voltage of exposed live parts.
  - c) Knowledge on the use of PPE, insulating and shielding materials and insulated tools.
  - d) All of the above
- 9)** If electric wires and appliances are overheated due to high voltage of electric current, they can
- |               |                 |
|---------------|-----------------|
| a) catch fire | b) burn         |
| c) freeze     | d) both a and b |
- 10)** Do not use appliances, if
- |                     |                  |
|---------------------|------------------|
| a) damaged          | b) wires exposed |
| c) working properly | d) both a and b  |

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**T. Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Safety**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Attempt any FIVE questions from Q.No.2.

2) Figures to the right indicate full marks

**Q.2 Attempt any FIVE.**

**40**

- 1) Write the safety precautions to be taken during the operation and maintenance of electrical equipment.
- 2) Explain in brief types of fire extinguisher.
- 3) State and explain method of artificial respiration.
- 4) Explain the effect of electrical shock on human body.
- 5) Explain the procedure of permit to do the work on electrical equipment.
- 6) State safety procedure during erection phase, commissioning phase and maintenance phase.



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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Solar Photovoltaic System Design & Installation**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which of the following is a main disadvantage of a solar PV system?
 

|                     |                    |
|---------------------|--------------------|
| a) Capital cost     | b) Operation cost  |
| c) Maintenance cost | d) Life cycle cost |
- 2) In India PV panel should be \_\_\_\_\_.
 

|                 |                          |
|-----------------|--------------------------|
| a) North Facing | b) North and East facing |
| c) East facing  | d) South facing          |
- 3) Which is not a part of Site feasibility study?
 

|                 |                               |
|-----------------|-------------------------------|
| a) Soil quality | b) Population of nearest city |
| c) Wind speed   | d) Location                   |
- 4) In a residential roof-top PV system, which is not taken in to the consideration?
 

|                              |                              |
|------------------------------|------------------------------|
| a) Nearest transmission grid | b) Load & load flow analysis |
| c) Roof area                 | d) Back up Hours             |
- 5) In Solar PV system, what does PR stands for \_\_\_\_\_.
 

|                      |                       |
|----------------------|-----------------------|
| a) Project Report    | b) Project Review     |
| c) Performance ratio | d) Performance review |
- 6) Efficiency of practically used solar cell is approximately \_\_\_\_\_.
 

|        |        |
|--------|--------|
| a) 25% | b) 15% |
| c) 40% | d) 20% |
- 7) Battery bank should not be installed in a location?
 

|                      |                             |
|----------------------|-----------------------------|
| a) Near PV array     | b) Well ventilated room     |
| c) Near control room | d) At high temperature area |
- 8) If the orientation of PV module changes from horizontal to vertical, Tilt angle will?
 

|            |                |
|------------|----------------|
| a) Change  | b) Remain same |
| c) Depends | d) Can't say   |

- 9)** Which is the key of efficiency in PV plant?
- a) Well design
  - b) Proper Cleaning & maintenance
  - c) Procurement
  - d) All of the above
- 10)** MPPT Stands for?
- a) Maximum Power Point Temperature
  - b) Maximum Power Produce Temperature
  - c) Maximum Power Point Tracker
  - d) Minimum Power Produce Temperature

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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022****ELECTRICAL ENGINEERING****Solar Photovoltaic System Design & Installation**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any Four questions from Q.No.2 to Q.No.6.  
2) Figures to the right indicates full marks.

- Q.2 Answer the following questions. 10**  
a) Explain the basic concept of Solar Energy.  
b) Write advantages of Renewable Energy.
- Q.3 Answer the following questions. 10**  
a) Explain PV module name plate specifications.  
b) Explain factors affecting output of PV module.
- Q.4 Answer the following questions. 10**  
a) Explain stand alone, Grid & Hybrid configurations of PV power system.  
b) Explain different components of PV system.
- Q.5 Answer the following questions. 10**  
a) Explain installation process of solar power plant.  
b) Explain inverter, its types and operation in solar PV system.
- Q.6 Answer the following questions. 10**  
a) Explain steps involved in PV system sizing.  
b) Explain different types of batteries used in solar PV system.

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# Solar Photovoltaic System Design & Installation

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 10

10

- 1) Efficiency of practically used solar cell is approximately \_\_\_\_\_.  
a) 25%                                      b) 15%  
c) 40%                                      d) 20%
- 2) Battery bank should not be installed in a location?  
a) Near PV array                          b) Well ventilated room  
c) Near control room                    d) At high temperature area
- 3) If the orientation of PV module changes from horizontal to vertical, Tilt angle will?  
a) Change                                      b) Remain same  
c) Depends                                    d) Can't say
- 4) Which is the key of efficiency in PV plant?  
a) Well design  
b) Proper Cleaning & maintenance  
c) Procurement  
d) All of the above
- 5) MPPT Stands for?  
a) Maximum Power Point Temperature  
b) Maximum Power Produce Temperature  
c) Maximum Power Point Tracker  
d) Minimum Power Produce Temperature
- 6) Which of the following is a main disadvantage of a solar PV system?  
a) Capital cost                                b) Operation cost  
c) Maintenance cost                        d) Life cycle cost
- 7) In India PV panel should be \_\_\_\_\_.  
a) North Facing                                b) North and East facing  
c) East facing                                    d) South facing
- 8) Which is not a part of Site feasibility study?  
a) Soil quality                                    b) Population of nearest city  
c) Wind speed                                    d) Location

- 9)** In a residential roof-top PV system, which is not taken in to the consideration?
- |                              |                              |
|------------------------------|------------------------------|
| a) Nearest transmission grid | b) Load & load flow analysis |
| c) Roof area                 | d) Back up Hours             |
- 10)** In Solar PV system, what does PR stands for \_\_\_\_\_.
- |                      |                       |
|----------------------|-----------------------|
| a) Project Report    | b) Project Review     |
| c) Performance ratio | d) Performance review |

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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Solar Photovoltaic System Design & Installation**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any Four questions from Q.No.2 to Q.No.6.  
2) Figures to the right indicates full marks.

- Q.2 Answer the following questions. 10**  
a) Explain the basic concept of Solar Energy.  
b) Write advantages of Renewable Energy.
- Q.3 Answer the following questions. 10**  
a) Explain PV module name plate specifications.  
b) Explain factors affecting output of PV module.
- Q.4 Answer the following questions. 10**  
a) Explain stand alone, Grid & Hybrid configurations of PV power system.  
b) Explain different components of PV system.
- Q.5 Answer the following questions. 10**  
a) Explain installation process of solar power plant.  
b) Explain inverter, its types and operation in solar PV system.
- Q.6 Answer the following questions. 10**  
a) Explain steps involved in PV system sizing.  
b) Explain different types of batteries used in solar PV system.

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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Solar Photovoltaic System Design & Installation**

Day & Date: Monday, 27-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which is the key of efficiency in PV plant?
  - a) Well design
  - b) Proper Cleaning & maintenance
  - c) Procurement
  - d) All of the above
- 2) MPPT Stands for?
  - a) Maximum Power Point Temperature
  - b) Maximum Power Produce Temperature
  - c) Maximum Power Point Tracker
  - d) Minimum Power Produce Temperature
- 3) Which of the following is a main disadvantage of a solar PV system?
  - a) Capital cost
  - b) Operation cost
  - c) Maintenance cost
  - d) Life cycle cost
- 4) In India PV panel should be \_\_\_\_\_.
  - a) North Facing
  - b) North and East facing
  - c) East facing
  - d) South facing
- 5) Which is not a part of Site feasibility study?
  - a) Soil quality
  - b) Population of nearest city
  - c) Wind speed
  - d) Location
- 6) In a residential roof-top PV system, which is not taken in to the consideration?
  - a) Nearest transmission grid
  - b) Load & load flow analysis
  - c) Roof area
  - d) Back up Hours
- 7) In Solar PV system, what does PR stands for \_\_\_\_\_.
  - a) Project Report
  - b) Project Review
  - c) Performance ratio
  - d) Performance review
- 8) Efficiency of practically used solar cell is approximately \_\_\_\_\_.
  - a) 25%
  - b) 15%
  - c) 40%
  - d) 20%

- 9)** Battery bank should not be installed in a location?
- |                      |                             |
|----------------------|-----------------------------|
| a) Near PV array     | b) Well ventilated room     |
| c) Near control room | d) At high temperature area |
- 10)** If the orientation of PV module changes from horizontal to vertical, Tilt angle will?
- |            |                |
|------------|----------------|
| a) Change  | b) Remain same |
| c) Depends | d) Can't say   |



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| Set | R |
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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Solar Photovoltaic System Design & Installation**

Day & Date: Monday, 27-02-2023

Max. Marks: 40

Time: 10:00 AM To 12:00 PM

**Instructions:** 1) Solve any Four questions from Q.No.2 to Q.No.6.  
 2) Figures to the right indicates full marks.

- Q.2 Answer the following questions. 10**  
 a) Explain the basic concept of Solar Energy.  
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- Q.3 Answer the following questions. 10**  
 a) Explain PV module name plate specifications.  
 b) Explain factors affecting output of PV module.
- Q.4 Answer the following questions. 10**  
 a) Explain stand alone, Grid & Hybrid configurations of PV power system.  
 b) Explain different components of PV system.
- Q.5 Answer the following questions. 10**  
 a) Explain installation process of solar power plant.  
 b) Explain inverter, its types and operation in solar PV system.
- Q.6 Answer the following questions. 10**  
 a) Explain steps involved in PV system sizing.  
 b) Explain different types of batteries used in solar PV system.

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S

**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Solar Photovoltaic System Design & Installation**

Day &amp; Date: Monday, 27-02-2023

Max. Marks: 50

Time: 10:00 AM To 12:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options.**

**10**

- 1) Which is not a part of Site feasibility study?
  - a) Soil quality
  - b) Population of nearest city
  - c) Wind speed
  - d) Location
- 2) In a residential roof-top PV system, which is not taken in to the consideration?
  - a) Nearest transmission grid
  - b) Load & load flow analysis
  - c) Roof area
  - d) Back up Hours
- 3) In Solar PV system, what does PR stands for \_\_\_\_\_.
  - a) Project Report
  - b) Project Review
  - c) Performance ratio
  - d) Performance review
- 4) Efficiency of practically used solar cell is approximately \_\_\_\_\_.
  - a) 25%
  - b) 15%
  - c) 40%
  - d) 20%
- 5) Battery bank should not be installed in a location?
  - a) Near PV array
  - b) Well ventilated room
  - c) Near control room
  - d) At high temperature area
- 6) If the orientation of PV module changes from horizontal to vertical, Tilt angle will?
  - a) Change
  - b) Remain same
  - c) Depends
  - d) Can't say
- 7) Which is the key of efficiency in PV plant?
  - a) Well design
  - b) Proper Cleaning & maintenance
  - c) Procurement
  - d) All of the above
- 8) MPPT Stands for?
  - a) Maximum Power Point Temperature
  - b) Maximum Power Produce Temperature
  - c) Maximum Power Point Tracker
  - d) Minimum Power Produce Temperature

- 9)** Which of the following is a main disadvantage of a solar PV system?
- |                     |                    |
|---------------------|--------------------|
| a) Capital cost     | b) Operation cost  |
| c) Maintenance cost | d) Life cycle cost |
- 10)** In India PV panel should be \_\_\_\_\_.
- |                 |                          |
|-----------------|--------------------------|
| a) North Facing | b) North and East facing |
| c) East facing  | d) South facing          |

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**T.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Solar Photovoltaic System Design & Installation**

Day & Date: Monday, 27-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Solve any Four questions from Q.No.2 to Q.No.6.  
2) Figures to the right indicates full marks.

- Q.2 Answer the following questions. 10**  
a) Explain the basic concept of Solar Energy.  
b) Write advantages of Renewable Energy.
- Q.3 Answer the following questions. 10**  
a) Explain PV module name plate specifications.  
b) Explain factors affecting output of PV module.
- Q.4 Answer the following questions. 10**  
a) Explain stand alone, Grid & Hybrid configurations of PV power system.  
b) Explain different components of PV system.
- Q.5 Answer the following questions. 10**  
a) Explain installation process of solar power plant.  
b) Explain inverter, its types and operation in solar PV system.
- Q.6 Answer the following questions. 10**  
a) Explain steps involved in PV system sizing.  
b) Explain different types of batteries used in solar PV system.

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Industrial Drives Control**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) A synchronous motor is a useful industrial machine due to its property of
  - a) Improving the power factor
  - b) Speed is constant
  - c) Can always be adjusted to operate at unity power factor
  - d) All of the above
- 2) When load on a synchronous motor is increased, its armature currents in increased provided it
  - a) Normally-Excited
  - b) Over-Excited
  - c) Under-Excited
  - d) All of the above
- 3) A synchronous motor can be started by
  - a) Pony Motor
  - b) D.C. compound winding
  - c) Providing damper winding
  - d) None of the above
- 4) The motor normally used for crane travel is
  - a) AC slip ring motor
  - b) Ward Leonard controlled DC shunt motor
  - c) Synchronous motor
  - d) DC differentially compound motor
- 5) The maximum horse power up to which 440 V electric motors are used, is
  - a) 200 HP
  - b) 50 HP
  - c) 20 HP
  - d) 10 HP.
- 6) Pole changing method of speed control is used in
  - a) Slip ring induction motor
  - b) DC shunt motor
  - c) DC series motor
  - d) Squirrel cage induction motor

- 7) Rotor resistance speed control is used in  
a) Squirrel cage induction motor  
b) Synchronous motor  
c) Slip ring induction motor  
d) DC shunt motor
- 8) Which electromagnet is preferred for noiseless operation?  
a) DC operated  
b) AC Operated  
c) Any of the above  
d) None of the above
- 9) For high frequency choppers the device that is preferred is  
a) Thyristor  
b) TRIAC  
c) Transistor  
d) GTO
- 10) Ward-Leonard controlled dc drives are generally used for  
a) Light duty excavators  
b) Medium duty excavators  
c) Heavy duty Excavators  
d) All of the above
- 11) The equilibrium speed of a motor load system is obtained  
a) When motor torque equals the load torque  
b) When motor torque is less than the load torque  
c) When motor torque is more than the load torque  
d) None of these
- 12) In a constant power type load  
a) Torque is proportional to speed  
b) Torque is proportional to square of speed  
c) Torque is inversely proportional to speed  
d) Torque is independent to speed.
- 13) According to fan laws  
a)  $V_1 / V_2 = (d_1 / d_2) (RPM_1 / RPM_2)$   
b)  $V_1 / V_2 = (d_1 / d_2)^2 (RPM_1 / RPM_2)$   
c)  $V_1 / V_2 = (d_1 / d_2)^3 (RPM_1 / RPM_2)$   
d) None of these
- 14) \_\_\_\_\_ duty cycle consists of frequent on load and off-load period.  
a) Continuous Duty with constant Load  
b) Continuous Duty With the variable load  
c) Short Time duty  
d) Intermittent duty

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**Set P**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Industrial Drives Control**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figure to right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Draw the block diagram of electrical drive system and explain.
- b) Explain the closed loop control of electrical drives.
- c) Explain the multi quadrant operation with neat diagram.
- d) Draw and explain single phase half controlled rectifier fed separately excited D.C. motor.
- e) Write the classification of drives with examples.

**Q.3 Solve the following.** **12**

- a) Explain the chopper control DC separately excited motor in motoring and regenerative braking modes.

**OR**

- a) For D.C series motor and shunt motor draw & explain
  - i) Speed load characteristics
  - ii) Speed torque characteristics
- c) Explain Regenerative braking of DC series motor

**Section - II**

**Q.4 Solve any four of the following.** **16**

- a) Explain the operation of slip ring IM by static rotor resistance control.
- b) Explain Stepper motor drives operation & converter circuit.
- c) Explain the converter circuit for battery operated drives.
- d) Explain the converter circuit for switched reluctance motor drives.
- e) Discuss the speed control of AC motors by using three phase AC Voltage regulators.

**Q.5 Solve any two of the following.** **12**

- a) Explain the static Kramer method and static schrebius method of speed control of three phase induction motor.
- b) What are the different types of stepper motors are there? Explain their operation.
- c) Explain the V/f control method of AC drive with neat sketches.

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Industrial Drives Control**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which electromagnet is preferred for noiseless operation?
  - a) DC operated
  - b) AC Operated
  - c) Any of the above
  - d) None of the above
- 2) For high frequency choppers the device that is preferred is
  - a) Thyristor
  - b) TRIAC
  - c) Transistor
  - d) GTO
- 3) Ward-Leonard controlled dc drives are generally used for
  - a) Light duty excavators
  - b) Medium duty excavators
  - c) Heavy duty Excavators
  - d) All of the above
- 4) The equilibrium speed of a motor load system is obtained
  - a) When motor torque equals the load torque
  - b) When motor torque is less than the load torque
  - c) When motor torque is more than the load torque
  - d) None of these
- 5) In a constant power type load
  - a) Torque is proportional to speed
  - b) Torque is proportional to square of speed
  - c) Torque is inversely proportional to speed
  - d) Torque is independent to speed.
- 6) According to fan laws
  - a)  $V_1 / V_2 = (d_1 / d_2) (RPM_1 / RPM_2)$
  - b)  $V_1 / V_2 = (d_1 / d_2)^2 (RPM_1 / RPM_2)$
  - c)  $V_1 / V_2 = (d_1 / d_2)^3 (RPM_1 / RPM_2)$
  - d) None of these



- 7) \_\_\_\_\_ duty cycle consists of frequent on load and off-load period.
- a) Continuous Duty with constant Load
  - b) Continuous Duty With the variable load
  - c) Short Time duty
  - d) Intermittent duty
- 8) A synchronous motor is a useful industrial machine due to its property of
- a) Improving the power factor
  - b) Speed is constant
  - c) Can always be adjusted to operate at unity power factor
  - d) All of the above
- 9) When load on a synchronous motor is increased, its armature currents in increased provided it
- a) Normally-Excited
  - b) Over-Excited
  - c) Under-Excited
  - d) All of the above
- 10) A synchronous motor can be started by
- a) Pony Motor
  - b) D.C. compound winding
  - c) Providing damper winding
  - d) None of the above
- 11) The motor normally used for crane travel is
- a) AC slip ring motor
  - b) Ward Leonard controlled DC shunt motor
  - c) Synchronous motor
  - d) DC differentially compound motor
- 12) The maximum horse power up to which 440 V electric motors are used, is
- a) 200 HP
  - b) 50 HP
  - c) 20 HP
  - d) 10 HP.
- 13) Pole changing method of speed control is used in
- a) Slip ring induction motor
  - b) DC shunt motor
  - c) DC series motor
  - d) Squirrel cage induction motor
- 14) Rotor resistance speed control is used in
- a) Squirrel cage induction motor
  - b) Synchronous motor
  - c) Slip ring induction motor
  - d) DC shunt motor

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**Set Q**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Industrial Drives Control**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figure to right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Draw the block diagram of electrical drive system and explain.
- b) Explain the closed loop control of electrical drives.
- c) Explain the multi quadrant operation with neat diagram.
- d) Draw and explain single phase half controlled rectifier fed separately excited D.C. motor.
- e) Write the classification of drives with examples.

**Q.3 Solve the following.** **12**

- a) Explain the chopper control DC separately excited motor in motoring and regenerative braking modes.

**OR**

- a) For D.C series motor and shunt motor draw & explain
  - i) Speed load characteristics
  - ii) Speed torque characteristics
- c) Explain Regenerative braking of DC series motor

**Section - II**

**Q.4 Solve any four of the following.** **16**

- a) Explain the operation of slip ring IM by static rotor resistance control.
- b) Explain Stepper motor drives operation & converter circuit.
- c) Explain the converter circuit for battery operated drives.
- d) Explain the converter circuit for switched reluctance motor drives.
- e) Discuss the speed control of AC motors by using three phase AC Voltage regulators.

**Q.5 Solve any two of the following.** **12**

- a) Explain the static Kramer method and static schrebius method of speed control of three phase induction motor.
- b) What are the different types of stepper motors are there? Explain their operation.
- c) Explain the V/f control method of AC drive with neat sketches.

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Industrial Drives Control**

Day & Date: Wednesday, 25-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
 2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The equilibrium speed of a motor load system is obtained
  - a) When motor torque equals the load torque
  - b) When motor torque is less than the load torque
  - c) When motor torque is more than the load torque
  - d) None of these
- 2) In a constant power type load
  - a) Torque is proportional to speed
  - b) Torque is proportional to square of speed
  - c) Torque is inversely proportional to speed
  - d) Torque is independent to speed.
- 3) According to fan laws
  - a)  $V_1 / V_2 = (d_1 / d_2) (RPM_1 / RPM_2)$
  - b)  $V_1 / V_2 = (d_1 / d_2)^2 (RPM_1 / RPM_2)$
  - c)  $V_1 / V_2 = (d_1 / d_2)^3 (RPM_1 / RPM_2)$
  - d) None of these
- 4) \_\_\_\_\_ duty cycle consists of frequent on load and off-load period.
  - a) Continuous Duty with constant Load
  - b) Continuous Duty With the variable load
  - c) Short Time duty
  - d) Intermittent duty
- 5) A synchronous motor is a useful industrial machine due to its property of
  - a) Improving the power factor
  - b) Speed is constant
  - c) Can always be adjusted to operate at unity power factor
  - d) All of the above

- 6) When load on a synchronous motor is increased, its armature currents in increased provided it
- a) Normally-Excited
  - b) Over-Excited
  - c) Under-Excited
  - d) All of the above
- 7) A synchronous motor can be started by
- a) Pony Motor
  - b) D.C. compound winding
  - c) Providing damper winding
  - d) None of the above
- 8) The motor normally used for crane travel is
- a) AC slip ring motor
  - b) Ward Leonard controlled DC shunt motor
  - c) Synchronous motor
  - d) DC differentially compound motor
- 9) The maximum horse power up to which 440 V electric motors are used, is
- a) 200 HP
  - b) 50 HP
  - c) 20 HP
  - d) 10 HP.
- 10) Pole changing method of speed control is used in
- a) Slip ring induction motor
  - b) DC shunt motor
  - c) DC series motor
  - d) Squirrel cage induction motor
- 11) Rotor resistance speed control is used in
- a) Squirrel cage induction motor
  - b) Synchronous motor
  - c) Slip ring induction motor
  - d) DC shunt motor
- 12) Which electromagnet is preferred for noiseless operation?
- a) DC operated
  - b) AC Operated
  - c) Any of the above
  - d) None of the above
- 13) For high frequency choppers the device that is preferred is
- a) Thyristor
  - b) TRIAC
  - c) Transistor
  - d) GTO
- 14) Ward-Leonard controlled dc drives are generally used for
- a) Light duty excavators
  - b) Medium duty excavators
  - c) Heavy duty Excavators
  - d) All of the above

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**Set R**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Industrial Drives Control**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figure to right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Draw the block diagram of electrical drive system and explain.
- b) Explain the closed loop control of electrical drives.
- c) Explain the multi quadrant operation with neat diagram.
- d) Draw and explain single phase half controlled rectifier fed separately excited D.C. motor.
- e) Write the classification of drives with examples.

**Q.3 Solve the following.** **12**

- a) Explain the chopper control DC separately excited motor in motoring and regenerative braking modes.

**OR**

- a) For D.C series motor and shunt motor draw & explain
  - i) Speed load characteristics
  - ii) Speed torque characteristics
- c) Explain Regenerative braking of DC series motor

**Section - II**

**Q.4 Solve any four of the following.** **16**

- a) Explain the operation of slip ring IM by static rotor resistance control.
- b) Explain Stepper motor drives operation & converter circuit.
- c) Explain the converter circuit for battery operated drives.
- d) Explain the converter circuit for switched reluctance motor drives.
- e) Discuss the speed control of AC motors by using three phase AC Voltage regulators.

**Q.5 Solve any two of the following.** **12**

- a) Explain the static Kramer method and static schrebius method of speed control of three phase induction motor.
- b) What are the different types of stepper motors are there? Explain their operation.
- c) Explain the V/f control method of AC drive with neat sketches.

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Industrial Drives Control**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory it should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book) Each question carries one mark.  
2) Don't forget to mention the question paper Set (P/Q/R/S) at the top of the Same page.  
3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Pole changing method of speed control is used in
  - a) Slip ring induction motor
  - b) DC shunt motor
  - c) DC series motor
  - d) Squirrel cage induction motor
- 2) Rotor resistance speed control is used in
  - a) Squirrel cage induction motor
  - b) Synchronous motor
  - c) Slip ring induction motor
  - d) DC shunt motor
- 3) Which electromagnet is preferred for noiseless operation?
  - a) DC operated
  - b) AC Operated
  - c) Any of the above
  - d) None of the above
- 4) For high frequency choppers the device that is preferred is
  - a) Thyristor
  - b) TRIAC
  - c) Transistor
  - d) GTO
- 5) Ward-Leonard controlled dc drives are generally used for
  - a) Light duty excavators
  - b) Medium duty excavators
  - c) Heavy duty Excavators
  - d) All of the above
- 6) The equilibrium speed of a motor load system is obtained
  - a) When motor torque equals the load torque
  - b) When motor torque is less than the load torque
  - c) When motor torque is more than the load torque
  - d) None of these
- 7) In a constant power type load
  - a) Torque is proportional to speed
  - b) Torque is proportional to square of speed
  - c) Torque is inversely proportional to speed
  - d) Torque is independent to speed.

- 8) According to fan laws
- a)  $V_1 / V_2 = (d_1 / d_2) (RPM_1 / RPM_2)$
  - b)  $V_1 / V_2 = (d_1 / d_2)^2 (RPM_1 / RPM_2)$
  - c)  $V_1 / V_2 = (d_1 / d_2)^3 (RPM_1 / RPM_2)$
  - d) None of these
- 9) \_\_\_\_\_ duty cycle consists of frequent on load and off-load period.
- a) Continuous Duty with constant Load
  - b) Continuous Duty With the variable load
  - c) Short Time duty
  - d) Intermittent duty
- 10) A synchronous motor is a useful industrial machine due to its property of
- a) Improving the power factor
  - b) Speed is constant
  - c) Can always be adjusted to operate at unity power factor
  - d) All of the above
- 11) When load on a synchronous motor is increased, its armature currents in increased provided it
- a) Normally-Excited
  - b) Over-Excited
  - c) Under-Excited
  - d) All of the above
- 12) A synchronous motor can be started by
- a) Pony Motor
  - b) D.C. compound winding
  - c) Providing damper winding
  - d) None of the above
- 13) The motor normally used for crane travel is
- a) AC slip ring motor
  - b) Ward Leonard controlled DC shunt motor
  - c) Synchronous motor
  - d) DC differentially compound motor
- 14) The maximum horse power up to which 440 V electric motors are used, is
- a) 200 HP
  - b) 50 HP
  - c) 20 HP
  - d) 10 HP.

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**Set S**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Industrial Drives Control**

Day & Date: Wednesday, 25-01-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figure to right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Draw the block diagram of electrical drive system and explain.
- b) Explain the closed loop control of electrical drives.
- c) Explain the multi quadrant operation with neat diagram.
- d) Draw and explain single phase half controlled rectifier fed separately excited D.C. motor.
- e) Write the classification of drives with examples.

**Q.3 Solve the following.** **12**

- a) Explain the chopper control DC separately excited motor in motoring and regenerative braking modes.

**OR**

- a) For D.C series motor and shunt motor draw & explain
  - i) Speed load characteristics
  - ii) Speed torque characteristics
- c) Explain Regenerative braking of DC series motor

**Section - II**

**Q.4 Solve any four of the following.** **16**

- a) Explain the operation of slip ring IM by static rotor resistance control.
- b) Explain Stepper motor drives operation & converter circuit.
- c) Explain the converter circuit for battery operated drives.
- d) Explain the converter circuit for switched reluctance motor drives.
- e) Discuss the speed control of AC motors by using three phase AC Voltage regulators.

**Q.5 Solve any two of the following.** **12**

- a) Explain the static Kramer method and static schrebius method of speed control of three phase induction motor.
- b) What are the different types of stepper motors are there? Explain their operation.
- c) Explain the V/f control method of AC drive with neat sketches.



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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System and Operation Control**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Multiple choice questions.**

**14**

- 1) Economic dispatch problem \_\_\_\_\_.  
 a) To minimize the operating cost  
 b) To minimize fuel cost only  
 c) To minimize the load demand  
 d) To minimize the cost of transportation
- 2) Heat rate is defined as \_\_\_\_\_.  
 a) Ratio of fuel input to the corresponding power output  
 b) Ratio of fuel output to the corresponding power output  
 c) Ratio of heat input to the corresponding power output  
 d) Ratio of heat output to the corresponding power input
- 3) What will be the penalty factor for a unit, if the generating station is located very close to load Centre?  
 a) Zero  
 b) Almost equal to unity  
 c) The penalty factor is negative  
 d) The value is very high
- 4) What is the unit of transmission loss coefficient?  
 a) MW  
 b)  $(MW)^{-1}$   
 c) Unit less  
 d)  $(MW)^2$
- 5) The units for heat rate are \_\_\_\_\_.  
 a) Kcal/KWh  
 b) KWh/kcal  
 c) Kcal/hour  
 d) KW
- 6) In dynamic programming method the cost function  $F_N(y)$  represents  
 a) Cost of generation of N MW by y number of unit  
 b) Cost of generation of y MW by N number of unit  
 c) Cost of generation of y MW by  $N^{th}$  unit  
 d) Cost of generation of N MW by  $y^{th}$  unit
- 7) The one of unit commitment solution method \_\_\_\_\_.  
 a) Priority list method  
 b) Dynamic programming method  
 c) Lagrange relaxation method  
 d) All of these

- 8) To commit the generating unit is \_\_\_\_\_.  
a) To bring it up to the speed  
b) To synchronize to the system  
c) To connect it so that it can deliver the power to the network  
d) All of these
- 9) The frequency controlled from both side is known as \_\_\_\_\_.  
a) Parallel frequency control  
b) Flat frequency control  
c) Selective frequency control  
d) flat tie line control
- 10) What is the condition for uncontrolled case in two area system?  
a)  $\Delta P_{c1} = 0$   
b)  $\Delta P_{c2} = 0$   
c)  $\Delta P_{c1} = \Delta P_{c2} = 0$   
d) None
- 11) Load frequency control uses \_\_\_\_\_.  
a) Proportional integral controller  
b) Proportional derivative control  
c) Both proportional derivative & Integral controller  
d) Either proportional or integral
- 12) The unit of speed regulation of governor is \_\_\_\_\_.  
a) Hz  
b) Hz/MVA  
c) Hz/MW  
d) None
- 13) Energy Management System contains \_\_\_\_\_.  
a) Secure  
b) Correctable Emergency  
c) Restoration  
d) All of the above
- 14) Security assessment involves \_\_\_\_\_.  
a) System monitoring  
b) Contingency analysis  
c) Both of above  
d) Not divided

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Set **P**

**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System and Operation Control**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain the following
  - i) Incremental fuel cost
  - ii) Incremental production cost
- b) Explain with mathematical formulation the economic load dispatch including transmission losses and penalty factor.
- c) What is mean by unit commitment? Explain the necessity of it.
- d) Write a short note on spinning reserve.
- e) Explain the thermal unit constraint.

**Q.3 Solve any Two** **12**

- a) What are the different methods of unit commitment? Explain the priority list method for unit commitment with suitable example.
- b) Explain the load frequency control of single area system with neat diagram.
- c) The fuel cost of two units are given by

$$C_1 = 0.1 P_{G_1}^2 + 25 P_{G_1} + 1.6 \text{ Rs/hr}$$

$$C_2 = 0.1 P_{G_2}^2 + 32 P_{G_2} + 2.1 \text{ Rs/hr}$$

If the total demand on the generators is 250 MW, find the economical load distribution of the two units

**Section – II**

**Q.4 Solve any four** **16**

- a) Explain the different methods of improving voltage stability.
- b) What is mean by load compensation? Explain briefly.
- c) Explain system state classification with neat diagram.
- d) Give the difference between voltage angle and voltage stability.
- e) Explain specifications of Load compensator.

**Q.5 Solve any Two** **12**

- a) Explain compensation of reactive power in power system in detail.
- b) Give the advantages and dis-advantages of different types of compensating equipment for the transmission system.
- c) Explain the necessity of power system security.

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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System and Operation Control**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Multiple choice questions.**

**14**

- 1) To commit the generating unit is \_\_\_\_\_.
  - a) To bring it up to the speed
  - b) To synchronize to the system
  - c) To connect it so that it can deliver the power to the network
  - d) All of these
- 2) The frequency controlled from both side is known as \_\_\_\_\_.
  - a) Parallel frequency control
  - b) Flat frequency control
  - c) Selective frequency control
  - d) flat tie line control
- 3) What is the condition for uncontrolled case in two area system?
 

|                                        |                        |
|----------------------------------------|------------------------|
| a) $\Delta P_{c1} = 0$                 | b) $\Delta P_{c2} = 0$ |
| c) $\Delta P_{c1} = \Delta P_{c2} = 0$ | d) None                |
- 4) Load frequency control uses \_\_\_\_\_.
  - a) Proportional integral controller
  - b) Proportional derivative control
  - c) Both proportional derivative & Integral controller
  - d) Either proportional or integral
- 5) The unit of speed regulation of governor is \_\_\_\_\_.
 

|          |           |
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| a) Hz    | b) Hz/MVA |
| c) Hz/MW | d) None   |
- 6) Energy Management System contains \_\_\_\_\_.
  - a) Secure
  - b) Correctable Emergency
  - c) Restoration
  - d) All of the above
- 7) Security assessment involves \_\_\_\_\_.
 

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| a) System monitoring | b) Contingency analysis |
| c) Both of above     | d) Not divided          |

- 8) Economic dispatch problem \_\_\_\_\_.  
a) To minimize the operating cost  
b) To minimize fuel cost only  
c) To minimize the load demand  
d) To minimize the cost of transportation
- 9) Heat rate is defined as \_\_\_\_\_.  
a) Ratio of fuel input to the corresponding power output  
b) Ratio of fuel output to the corresponding power output  
c) Ratio of heat input to the corresponding power output  
d) Ratio of heat output to the corresponding power input
- 10) What will be the penalty factor for a unit, if the generating station is located very close to load Centre?  
a) Zero  
b) Almost equal to unity  
c) The penalty factor is negative  
d) The value is very high
- 11) What is the unit of transmission loss coefficient?  
a) MW  
b)  $(MW)^{-1}$   
c) Unit less  
d)  $(MW)^2$
- 12) The units for heat rate are \_\_\_\_\_.  
a) Kcal/KWh  
b) KWh/kcal  
c) Kcal/hour  
d) KW
- 13) In dynamic programming method the cost function  $F_N(y)$  represents  
a) Cost of generation of N MW by y number of unit  
b) Cost of generation of y MW by N number of unit  
c) Cost of generation of y MW by  $N^{th}$  unit  
d) Cost of generation of N MW by  $y^{th}$  unit
- 14) The one of unit commitment solution method \_\_\_\_\_.  
a) Priority list method  
b) Dynamic programming method  
c) Lagrange relaxation method  
d) All of these

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Set **Q**

**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System and Operation Control**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain the following
  - i) Incremental fuel cost
  - ii) Incremental production cost
- b) Explain with mathematical formulation the economic load dispatch including transmission losses and penalty factor.
- c) What is mean by unit commitment? Explain the necessity of it.
- d) Write a short note on spinning reserve.
- e) Explain the thermal unit constraint.

**Q.3 Solve any Two** **12**

- a) What are the different methods of unit commitment? Explain the priority list method for unit commitment with suitable example.
- b) Explain the load frequency control of single area system with neat diagram.
- c) The fuel cost of two units are given by

$$C_1 = 0.1 P_{G_1}^2 + 25 P_{G_1} + 1.6 \text{ Rs/hr}$$

$$C_2 = 0.1 P_{G_2}^2 + 32 P_{G_2} + 2.1 \text{ Rs/hr}$$

If the total demand on the generators is 250 MW, find the economical load distribution of the two units

**Section – II**

**Q.4 Solve any four** **16**

- a) Explain the different methods of improving voltage stability.
- b) What is mean by load compensation? Explain briefly.
- c) Explain system state classification with neat diagram.
- d) Give the difference between voltage angle and voltage stability.
- e) Explain specifications of Load compensator.

**Q.5 Solve any Two** **12**

- a) Explain compensation of reactive power in power system in detail.
- b) Give the advantages and dis-advantages of different types of compensating equipment for the transmission system.
- c) Explain the necessity of power system security.

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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System and Operation Control**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Multiple choice questions.**

**14**

- 1) Load frequency control uses \_\_\_\_\_.  
 a) Proportional integral controller  
 b) Proportional derivative control  
 c) Both proportional derivative & Integral controller  
 d) Either proportional or integral
- 2) The unit of speed regulation of governor is \_\_\_\_\_.  
 a) Hz  
 b) Hz/MVA  
 c) Hz/MW  
 d) None
- 3) Energy Management System contains \_\_\_\_\_.  
 a) Secure  
 b) Correctable Emergency  
 c) Restoration  
 d) All of the above
- 4) Security assessment involves \_\_\_\_\_.  
 a) System monitoring  
 b) Contingency analysis  
 c) Both of above  
 d) Not divided
- 5) Economic dispatch problem \_\_\_\_\_.  
 a) To minimize the operating cost  
 b) To minimize fuel cost only  
 c) To minimize the load demand  
 d) To minimize the cost of transportation
- 6) Heat rate is defined as \_\_\_\_\_.  
 a) Ratio of fuel input to the corresponding power output  
 b) Ratio of fuel output to the corresponding power output  
 c) Ratio of heat input to the corresponding power output  
 d) Ratio of heat output to the corresponding power input
- 7) What will be the penalty factor for a unit, if the generating station is located very close to load Centre?  
 a) Zero  
 b) Almost equal to unity  
 c) The penalty factor is negative  
 d) The value is very high

- 8) What is the unit of transmission loss coefficient?  
a) MW  
b)  $(MW)^{-1}$   
c) Unit less  
d)  $(MW)^2$
- 9) The units for heat rate are \_\_\_\_\_.  
a) Kcal/KWh  
b) KWh/kcal  
c) Kcal/hour  
d) KW
- 10) In dynamic programming method the cost function  $F_N(y)$  represents  
a) Cost of generation of N MW by y number of unit  
b) Cost of generation of y MW by N number of unit  
c) Cost of generation of y MW by  $N^{th}$  unit  
d) Cost of generation of N MW by  $y^{th}$  unit
- 11) The one of unit commitment solution method \_\_\_\_\_.  
a) Priority list method  
b) Dynamic programming method  
c) Lagrange relaxation method  
d) All of these
- 12) To commit the generating unit is \_\_\_\_\_.  
a) To bring it up to the speed  
b) To synchronize to the system  
c) To connect it so that it can deliver the power to the network  
d) All of these
- 13) The frequency controlled from both side is known as \_\_\_\_\_.  
a) Parallel frequency control  
b) Flat frequency control  
c) Selective frequency control  
d) flat tie line control
- 14) What is the condition for uncontrolled case in two area system?  
a)  $\Delta P_{c1} = 0$   
b)  $\Delta P_{c2} = 0$   
c)  $\Delta P_{c1} = \Delta P_{c2} = 0$   
d) None



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Set **R**

**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**

**Power System and Operation Control**

Day &amp; Date: Tuesday, 31-01-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain the following
  - i) Incremental fuel cost
  - ii) Incremental production cost
- b) Explain with mathematical formulation the economic load dispatch including transmission losses and penalty factor.
- c) What is mean by unit commitment? Explain the necessity of it.
- d) Write a short note on spinning reserve.
- e) Explain the thermal unit constraint.

**Q.3 Solve any Two** **12**

- a) What are the different methods of unit commitment? Explain the priority list method for unit commitment with suitable example.
- b) Explain the load frequency control of single area system with neat diagram.
- c) The fuel cost of two units are given by

$$C_1 = 0.1 P_{G_1}^2 + 25 P_{G_1} + 1.6 \text{ Rs/hr}$$

$$C_2 = 0.1 P_{G_2}^2 + 32 P_{G_2} + 2.1 \text{ Rs/hr}$$

If the total demand on the generators is 250 MW, find the economical load distribution of the two units

**Section – II**

**Q.4 Solve any four** **16**

- a) Explain the different methods of improving voltage stability.
- b) What is mean by load compensation? Explain briefly.
- c) Explain system state classification with neat diagram.
- d) Give the difference between voltage angle and voltage stability.
- e) Explain specifications of Load compensator.

**Q.5 Solve any Two** **12**

- a) Explain compensation of reactive power in power system in detail.
- b) Give the advantages and dis-advantages of different types of compensating equipment for the transmission system.
- c) Explain the necessity of power system security.

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**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System and Operation Control**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Multiple choice questions.**

**14**

- 1) In dynamic programming method the cost function  $F_N(y)$  represents
  - a) Cost of generation of N MW by y number of unit
  - b) Cost of generation of y MW by N number of unit
  - c) Cost of generation of y MW by  $N^{\text{th}}$  unit
  - d) Cost of generation of N MW by  $y^{\text{th}}$  unit
- 2) The one of unit commitment solution method \_\_\_\_\_.
  - a) Priority list method
  - b) Dynamic programming method
  - c) Lagrange relaxation method
  - d) All of these
- 3) To commit the generating unit is \_\_\_\_\_.
  - a) To bring it up to the speed
  - b) To synchronize to the system
  - c) To connect it so that it can deliver the power to the network
  - d) All of these
- 4) The frequency controlled from both side is known as \_\_\_\_\_.
  - a) Parallel frequency control
  - b) Flat frequency control
  - c) Selective frequency control
  - d) flat tie line control
- 5) What is the condition for uncontrolled case in two area system?
  - a)  $\Delta P_{c1} = 0$
  - b)  $\Delta P_{c2} = 0$
  - c)  $\Delta P_{c1} = \Delta P_{c2} = 0$
  - d) None
- 6) Load frequency control uses \_\_\_\_\_.
  - a) Proportional integral controller
  - b) Proportional derivative control
  - c) Both proportional derivative & Integral controller
  - d) Either proportional or integral
- 7) The unit of speed regulation of governor is \_\_\_\_\_.
  - a) Hz
  - b) Hz/MVA
  - c) Hz/MW
  - d) None

- 8) Energy Management System contains \_\_\_\_\_.  
a) Secure  
b) Correctable Emergency  
c) Restoration  
d) All of the above
- 9) Security assessment involves \_\_\_\_\_.  
a) System monitoring  
b) Contingency analysis  
c) Both of above  
d) Not divided
- 10) Economic dispatch problem \_\_\_\_\_.  
a) To minimize the operating cost  
b) To minimize fuel cost only  
c) To minimize the load demand  
d) To minimize the cost of transportation
- 11) Heat rate is defined as \_\_\_\_\_.  
a) Ratio of fuel input to the corresponding power output  
b) Ratio of fuel output to the corresponding power output  
c) Ratio of heat input to the corresponding power output  
d) Ratio of heat output to the corresponding power input
- 12) What will be the penalty factor for a unit, if the generating station is located very close to load Centre?  
a) Zero  
b) Almost equal to unity  
c) The penalty factor is negative  
d) The value is very high
- 13) What is the unit of transmission loss coefficient?  
a) MW  
b)  $(MW)^{-1}$   
c) Unit less  
d)  $(MW)^2$
- 14) The units for heat rate are \_\_\_\_\_.  
a) Kcal/KWh  
b) KWh/kcal  
c) Kcal/hour  
d) KW

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Set **S**

**Fourth Year (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System and Operation Control**

Day & Date: Tuesday, 31-01-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain the following
  - i) Incremental fuel cost
  - ii) Incremental production cost
- b) Explain with mathematical formulation the economic load dispatch including transmission losses and penalty factor.
- c) What is mean by unit commitment? Explain the necessity of it.
- d) Write a short note on spinning reserve.
- e) Explain the thermal unit constraint.

**Q.3 Solve any Two** **12**

- a) What are the different methods of unit commitment? Explain the priority list method for unit commitment with suitable example.
- b) Explain the load frequency control of single area system with neat diagram.
- c) The fuel cost of two units are given by

$$C_1 = 0.1 P_{G_1}^2 + 25 P_{G_1} + 1.6 \text{ Rs/hr}$$

$$C_2 = 0.1 P_{G_2}^2 + 32 P_{G_2} + 2.1 \text{ Rs/hr}$$

If the total demand on the generators is 250 MW, find the economical load distribution of the two units

**Section – II**

**Q.4 Solve any four** **16**

- a) Explain the different methods of improving voltage stability.
- b) What is mean by load compensation? Explain briefly.
- c) Explain system state classification with neat diagram.
- d) Give the difference between voltage angle and voltage stability.
- e) Explain specifications of Load compensator.

**Q.5 Solve any Two** **12**

- a) Explain compensation of reactive power in power system in detail.
- b) Give the advantages and dis-advantages of different types of compensating equipment for the transmission system.
- c) Explain the necessity of power system security.

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**Fourth Year (B. Tech) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which Process is responsible for production of energy in the sun?
  - a) Nuclear fission reaction
  - b) Nuclear fusion reaction
  - c) Exothermal chemical reaction
  - d) All of the above
- 2) The charge carrier available in a semi-conductor material has \_\_\_\_\_.
  - a) Free electrons & holes
  - b) Only electrons
  - c) Only holes
  - d) Positively charged ions
- 3) The concentration-type solar collector \_\_\_\_\_.
  - a) First absorbs the radiation and then increases its concentration
  - b) Increases the density of solar radiation before absorbing it
  - c) Dilutes the density of solar radiation before absorbing it
  - d) Increases the intensity of solar radiation and then reflects it back
- 4) What does FPC stand for in solar energy?
  - a) Fluid plate circuit
  - b) Fixed plate collectors
  - c) Flat plate collectors
  - d) None of the above
- 5) Which of the following methods can be called passive solar energy collection?
  - a) Using heat absorbing construction materials
  - b) Rooftop solar panels
  - c) Photovoltaic cells
  - d) Rooftop flat plate solar collectors
- 6) Solar represents a minuscule portion of U.S. energy production because of \_\_\_\_\_.
  - a) Technological limitations
  - b) Lack of investment
  - c) Lack of scientific interest
  - d) Poor outlook for potential for this energy source
- 7) The wind speed is measured using an instrument called
  - a) Pyranometer
  - b) Manometer
  - c) Anemometer
  - d) Wind vane

- 8) Turbines blades have \_\_\_\_\_ type cross-section to extract energy from wind.
- |                |                     |
|----------------|---------------------|
| a) Aero foil   | b) Elliptical       |
| c) Rectangular | d) All of the above |
- 9) \_\_\_\_\_ is called as the bio gas.
- |                |                |
|----------------|----------------|
| a) Bio ethanol | b) Bio methane |
| c) Bio diesel  | d) Bio butanol |
- 10) The production of bio ethanol is by fermenting the \_\_\_\_\_ and starch components.
- |          |            |
|----------|------------|
| a) Acid  | b) Milk    |
| c) Sugar | d) Alcohol |
- 11) The geothermal energy is the \_\_\_\_\_ from the earth.
- |            |            |
|------------|------------|
| a) Heat    | b) Light   |
| c) Photons | d) Protons |
- 12) Flash geothermal power plants turns the high-pressure hot water into \_\_\_\_\_.
- |                            |                             |
|----------------------------|-----------------------------|
| a) Low pressure hot water  | b) Low pressure cool water  |
| c) High pressure hot water | d) High pressure cool water |
- 13) OTEC stands for \_\_\_\_\_.
- |                                          |
|------------------------------------------|
| a) Ocean Thermal Energy Conversion       |
| b) Ocean Thermal Energy Component        |
| c) Ocean Thermodynamic Energy Conversion |
| d) Ocean Thermodynamic Energy Component  |
- 14) The use of propeller turbine is desirable for the conditions of \_\_\_\_\_.
- |                                 |
|---------------------------------|
| a) Low head and high discharge  |
| b) High head and low discharge  |
| c) High head and high discharge |
| d) Low head and low discharge   |

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**Set P**

**Fourth Year (B. Tech) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Write short note on role and potential of new and renewable sources.
- b) Write a note on solar radiation data.
- c) What are the advantages and disadvantages of flat plate collector?
- d) Draw and Explain Advanced Solar Collector.
- e) Write short note on solar distillation system.
- f) Write a note on sensible heat storage & Latent heat storage.

**Q.3 Solve any two** **12**

- a) Define the terms:
  - 1) Tip speed ratio
  - 2) Swept area
  - 3) Solidity
  - 4) Cut-in speed
  - 5) Cut- out speed
  - 6) Rated speed
- b) Draw the neat diagrams of Savonious and Darrieus Wind Mills and explain their working.
- c) Describe solar Photovoltaic Technology with diagram.

**Section – II**

**Q.4 Solve any four** **16**

- a) What are the different sources of Biomass?
- b) With the help of block diagram explain utilization of biogas for cooking.
- c) Write short note on potential of geothermal resources in India.
- d) Write short note on Types of Geothermal wells.
- e) Explain the need for DEC.
- f) Explain tidal and wave energy.

**Q.5 Solve any two** **12**

- a) Draw and describe the working of Hybrid cycle OTEC system.
- b) Explain Carnot cycle and What are the limitations of DEC.
- c) Explain Tidal Energy Conversion System with proper diagram.

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Set **Q**

**Fourth Year (B. Tech) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Turbines blades have \_\_\_\_\_ type cross-section to extract energy from wind.
  - a) Aero foil
  - b) Elliptical
  - c) Rectangular
  - d) All of the above
- 2) \_\_\_\_\_ is called as the bio gas.
  - a) Bio ethanol
  - b) Bio methane
  - c) Bio diesel
  - d) Bio butanol
- 3) The production of bio ethanol is by fermenting the \_\_\_\_\_ and starch components.
  - a) Acid
  - b) Milk
  - c) Sugar
  - d) Alcohol
- 4) The geothermal energy is the \_\_\_\_\_ from the earth.
  - a) Heat
  - b) Light
  - c) Photons
  - d) Protons
- 5) Flash geothermal power plants turns the high-pressure hot water into \_\_\_\_\_.
  - a) Low pressure hot water
  - b) Low pressure cool water
  - c) High pressure hot water
  - d) High pressure cool water
- 6) OTEC stands for \_\_\_\_\_.
  - a) Ocean Thermal Energy Conversion
  - b) Ocean Thermal Energy Component
  - c) Ocean Thermodynamic Energy Conversion
  - d) Ocean Thermodynamic Energy Component
- 7) The use of propeller turbine is desirable for the conditions of \_\_\_\_\_.
  - a) Low head and high discharge
  - b) High head and low discharge
  - c) High head and high discharge
  - d) Low head and low discharge
- 8) Which Process is responsible for production of energy in the sun?
  - a) Nuclear fission reaction
  - b) Nuclear fusion reaction
  - c) Exothermal chemical reaction
  - d) All of the above



- 9) The charge carrier available in a semi-conductor material has \_\_\_\_\_.  
a) Free electrons & holes                      b) Only electrons  
c) Only holes                                      d) Positively charged ions
- 10) The concentration-type solar collector \_\_\_\_\_.  
a) First absorbs the radiation and then increases its concentration  
b) Increases the density of solar radiation before absorbing it  
c) Dilutes the density of solar radiation before absorbing it  
d) Increases the intensity of solar radiation and then reflects it back
- 11) What does FPC stand for in solar energy?  
a) Fluid plate circuit                              b) Fixed plate collectors  
c) Flat plate collectors                              d) None of the above
- 12) Which of the following methods can be called passive solar energy collection?  
a) Using heat absorbing construction materials  
b) Rooftop solar panels  
c) Photovoltaic cells  
d) Rooftop flat plate solar collectors
- 13) Solar represents a minuscule portion of U.S. energy production because of \_\_\_\_\_.  
a) Technological limitations  
b) Lack of investment  
c) Lack of scientific interest  
d) Poor outlook for potential for this energy source
- 14) The wind speed is measured using an instrument called  
a) Pyranometer                                      b) Manometer  
c) Anemometer                                      d) Wind vane

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**Set Q**

**Fourth Year (B. Tech) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Write short note on role and potential of new and renewable sources.
- b) Write a note on solar radiation data.
- c) What are the advantages and disadvantages of flat plate collector?
- d) Draw and Explain Advanced Solar Collector.
- e) Write short note on solar distillation system.
- f) Write a note on sensible heat storage & Latent heat storage.

**Q.3 Solve any two** **12**

- a) Define the terms:
  - 1) Tip speed ratio
  - 2) Swept area
  - 3) Solidity
  - 4) Cut-in speed
  - 5) Cut- out speed
  - 6) Rated speed
- b) Draw the neat diagrams of Savonious and Darrieus Wind Mills and explain their working.
- c) Describe solar Photovoltaic Technology with diagram.

**Section – II**

**Q.4 Solve any four** **16**

- a) What are the different sources of Biomass?
- b) With the help of block diagram explain utilization of biogas for cooking.
- c) Write short note on potential of geothermal resources in India.
- d) Write short note on Types of Geothermal wells.
- e) Explain the need for DEC.
- f) Explain tidal and wave energy.

**Q.5 Solve any two** **12**

- a) Draw and describe the working of Hybrid cycle OTEC system.
- b) Explain Carnot cycle and What are the limitations of DEC.
- c) Explain Tidal Energy Conversion System with proper diagram.

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Set **R**

**Fourth Year (B. Tech) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) The geothermal energy is the \_\_\_\_\_ from the earth.
  - a) Heat
  - b) Light
  - c) Photons
  - d) Protons
- 2) Flash geothermal power plants turns the high-pressure hot water into \_\_\_\_\_.
  - a) Low pressure hot water
  - b) Low pressure cool water
  - c) High pressure hot water
  - d) High pressure cool water
- 3) OTEC stands for \_\_\_\_\_.
  - a) Ocean Thermal Energy Conversion
  - b) Ocean Thermal Energy Component
  - c) Ocean Thermodynamic Energy Conversion
  - d) Ocean Thermodynamic Energy Component
- 4) The use of propeller turbine is desirable for the conditions of \_\_\_\_\_.
  - a) Low head and high discharge
  - b) High head and low discharge
  - c) High head and high discharge
  - d) Low head and low discharge
- 5) Which Process is responsible for production of energy in the sun?
  - a) Nuclear fission reaction
  - b) Nuclear fusion reaction
  - c) Exothermal chemical reaction
  - d) All of the above
- 6) The charge carrier available in a semi-conductor material has \_\_\_\_\_.
  - a) Free electrons & holes
  - b) Only electrons
  - c) Only holes
  - d) Positively charged ions
- 7) The concentration-type solar collector \_\_\_\_\_.
  - a) First absorbs the radiation and then increases its concentration
  - b) Increases the density of solar radiation before absorbing it
  - c) Dilutes the density of solar radiation before absorbing it
  - d) Increases the intensity of solar radiation and then reflects it back
- 8) What does FPC stand for in solar energy?
  - a) Fluid plate circuit
  - b) Fixed plate collectors
  - c) Flat plate collectors
  - d) None of the above

- 9) Which of the following methods can be called passive solar energy collection?
- a) Using heat absorbing construction materials
  - b) Rooftop solar panels
  - c) Photovoltaic cells
  - d) Rooftop flat plate solar collectors
- 10) Solar represents a minuscule portion of U.S. energy production because of \_\_\_\_.
- a) Technological limitations
  - b) Lack of investment
  - c) Lack of scientific interest
  - d) Poor outlook for potential for this energy source
- 11) The wind speed is measured using an instrument called
- a) Pyranometer
  - b) Manometer
  - c) Anemometer
  - d) Wind vane
- 12) Turbines blades have \_\_\_\_\_ type cross-section to extract energy from wind.
- a) Aero foil
  - b) Elliptical
  - c) Rectangular
  - d) All of the above
- 13) \_\_\_\_\_ is called as the bio gas.
- a) Bio ethanol
  - b) Bio methane
  - c) Bio diesel
  - d) Bio butanol
- 14) The production of bio ethanol is by fermenting the \_\_\_\_\_ and starch components.
- a) Acid
  - b) Milk
  - c) Sugar
  - d) Alcohol

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**Set R**

**Fourth Year (B. Tech) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Write short note on role and potential of new and renewable sources.
- b) Write a note on solar radiation data.
- c) What are the advantages and disadvantages of flat plate collector?
- d) Draw and Explain Advanced Solar Collector.
- e) Write short note on solar distillation system.
- f) Write a note on sensible heat storage & Latent heat storage.

**Q.3 Solve any two** **12**

- a) Define the terms:
  - 1) Tip speed ratio
  - 2) Swept area
  - 3) Solidity
  - 4) Cut-in speed
  - 5) Cut- out speed
  - 6) Rated speed
- b) Draw the neat diagrams of Savonious and Darrieus Wind Mills and explain their working.
- c) Describe solar Photovoltaic Technology with diagram.

**Section – II**

**Q.4 Solve any four** **16**

- a) What are the different sources of Biomass?
- b) With the help of block diagram explain utilization of biogas for cooking.
- c) Write short note on potential of geothermal resources in India.
- d) Write short note on Types of Geothermal wells.
- e) Explain the need for DEC.
- f) Explain tidal and wave energy.

**Q.5 Solve any two** **12**

- a) Draw and describe the working of Hybrid cycle OTEC system.
- b) Explain Carnot cycle and What are the limitations of DEC.
- c) Explain Tidal Energy Conversion System with proper diagram.

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Set **S**

**Fourth Year (B. Tech) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Friday, 17-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Solar represents a minuscule portion of U.S. energy production because of \_\_\_\_\_.  
 a) Technological limitations  
 b) Lack of investment  
 c) Lack of scientific interest  
 d) Poor outlook for potential for this energy source
- 2) The wind speed is measured using an instrument called  
 a) Pyranometer  
 b) Manometer  
 c) Anemometer  
 d) Wind vane
- 3) Turbines blades have \_\_\_\_\_ type cross-section to extract energy from wind.  
 a) Aero foil  
 b) Elliptical  
 c) Rectangular  
 d) All of the above
- 4) \_\_\_\_\_ is called as the bio gas.  
 a) Bio ethanol  
 b) Bio methane  
 c) Bio diesel  
 d) Bio butanol
- 5) The production of bio ethanol is by fermenting the \_\_\_\_\_ and starch components.  
 a) Acid  
 b) Milk  
 c) Sugar  
 d) Alcohol
- 6) The geothermal energy is the \_\_\_\_\_ from the earth.  
 a) Heat  
 b) Light  
 c) Photons  
 d) Protons
- 7) Flash geothermal power plants turns the high-pressure hot water into \_\_\_\_\_.  
 a) Low pressure hot water  
 b) Low pressure cool water  
 c) High pressure hot water  
 d) High pressure cool water

- 8) OTEC stands for \_\_\_\_\_.  
a) Ocean Thermal Energy Conversion  
b) Ocean Thermal Energy Component  
c) Ocean Thermodynamic Energy Conversion  
d) Ocean Thermodynamic Energy Component
- 9) The use of propeller turbine is desirable for the conditions of \_\_\_\_\_.  
a) Low head and high discharge  
b) High head and low discharge  
c) High head and high discharge  
d) Low head and low discharge
- 10) Which Process is responsible for production of energy in the sun?  
a) Nuclear fission reaction                      b) Nuclear fusion reaction  
c) Exothermal chemical reaction              d) All of the above
- 11) The charge carrier available in a semi-conductor material has \_\_\_\_\_.  
a) Free electrons & holes                      b) Only electrons  
c) Only holes                                      d) Positively charged ions
- 12) The concentration-type solar collector \_\_\_\_\_.  
a) First absorbs the radiation and then increases its concentration  
b) Increases the density of solar radiation before absorbing it  
c) Dilutes the density of solar radiation before absorbing it  
d) Increases the intensity of solar radiation and then reflects it back
- 13) What does FPC stand for in solar energy?  
a) Fluid plate circuit                              b) Fixed plate collectors  
c) Flat plate collectors                              d) None of the above
- 14) Which of the following methods can be called passive solar energy collection?  
a) Using heat absorbing construction materials  
b) Rooftop solar panels  
c) Photovoltaic cells  
d) Rooftop flat plate solar collectors

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**Fourth Year (B. Tech) (Sem -I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Friday, 17-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Both Section are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Write short note on role and potential of new and renewable sources.
- b) Write a note on solar radiation data.
- c) What are the advantages and disadvantages of flat plate collector?
- d) Draw and Explain Advanced Solar Collector.
- e) Write short note on solar distillation system.
- f) Write a note on sensible heat storage & Latent heat storage.

**Q.3 Solve any two** **12**

- a) Define the terms:
  - 1) Tip speed ratio
  - 2) Swept area
  - 3) Solidity
  - 4) Cut-in speed
  - 5) Cut- out speed
  - 6) Rated speed
- b) Draw the neat diagrams of Savonious and Darrieus Wind Mills and explain their working.
- c) Describe solar Photovoltaic Technology with diagram.

**Section – II**

**Q.4 Solve any four** **16**

- a) What are the different sources of Biomass?
- b) With the help of block diagram explain utilization of biogas for cooking.
- c) Write short note on potential of geothermal resources in India.
- d) Write short note on Types of Geothermal wells.
- e) Explain the need for DEC.
- f) Explain tidal and wave energy.

**Q.5 Solve any two** **12**

- a) Draw and describe the working of Hybrid cycle OTEC system.
- b) Explain Carnot cycle and What are the limitations of DEC.
- c) Explain Tidal Energy Conversion System with proper diagram.



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**Fourth Y. (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Switchgear & Protection**

Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The most efficient torque producing actuating structure for the induction type relays is
  - a) Shaded pole structure
  - b) Watt hour meter structure
  - c) Induction cup structure
  - d) Single induction loop structure
- 2) What is the purpose of back up protection?
  - a) To increase the speed
  - b) To increase the reach
  - c) To leave no blind spot
  - d) To guard against failure of primary
- 3) Interruption of large currents by relay require
  - a) Arc suppressing blow out coils
  - b) Wide separation of the opened contacts
  - c) High speed opening of contacts
  - d) All of the above
- 4) Plug setting of an electromagnetic relay can be altered by varying
  - a) Number of ampere turns
  - b) Air gap of magnetic path
  - c) Adjustable back stop
  - d) None of these
- 5) The material used for fuse must have
  - a) Low melting point and high resistance
  - b) Low melting point and low resistance
  - c) High melting point and low resistance
  - d) Low melting point and any resistance
- 6) The relay best suited for phase fault relaying for medium transmission lines is:
  - a) Mho relay
  - b) Reactance relay
  - c) Impedance relay
  - d) None of the above
- 7) A differential relay measures the vector difference between
  - a) Two currents
  - b) Two voltages
  - c) Two or more similar electrical quantities
  - d) None of the above



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Set **P**

**Fourth Y. (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Switchgear & Protection**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four (4x4=16) 16**

- State the desirable qualities of protective scheme?
- Explain static overcurrent relay with neat diagram.
- What are the different types of fuse? Explain construction and operation of HRC fuse with neat diagram.
- Explain the following terms
  - Pick up current
  - Current Setting
  - Plug setting Multiplier
  - Time setting multiplier
- Explain how impedance relay is used for distance protection? Draw its characteristics on R-X diagram.
- Describe microprocessor based impedance relay with block diagram.

**Q.3 Solve any two (6x2=12) 12**

- Determine the time of operation of an IDMT relay rating 5A and having setting of 125% and TSM=0.5. The relay is connected through C.T. of 400/5A. The fault current is 4000A. The operating time for PSM of 8 is 3.2 Second.
- With a neat sketch explain electromagnetic attraction relay.
- Explain how admittance relay is used for distance protection? Draw its characteristics on R-X diagram.

**Section – II**

**Q.4 Solve any four (4x4=16) 16**

- Explain construction & operation of buchholz relay with neat diagram.
- Explain protection of generator against motoring action.
- Explain high resistance interruption method of arc in circuit breaker.
- Explain the following terms in case of circuit breaker
  - Restriking voltage
  - Recovery voltage
- With neat sketch explain construction & operation of air blast circuit breaker.
- With neat sketch explain metal oxide ZnO arrestors.

**Q.5 Solve any two (6x2=12) 12**

- Explain protection of induction motor for different faults.
- Explain construction, principle and operation of oil circuit breaker with neat diagram.
- Explain the phenomenon of current chopping in circuit breaker.

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Day & Date: Tuesday, 07-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

14

- 1) The delay fuses are used for the protection of \_\_\_\_\_.  
a) Motors  
b) Power outlet circuits  
c) Fluorescent lamps  
d) Light circuits
- 2) For which of the following protection from negative sequence currents is provided?  
a) Generators  
b) Motors  
c) Transmission line  
d) Transformers
- 3) Why is it difficult to interrupt a capacitive circuit?  
a) The current has a leading power factor  
b) The restriking voltage can be high  
c) Current magnitude is very small  
d) Stored energy in the capacitor is very high
- 4) By using low resistance method for arc extension what is the value of arc resistance?  
a) Arc resistance is zero  
b) Arc resistance is high  
c) Arc resistance is low  
d) Arc resistance is very high
- 5) What are the main disadvantages of using oil as the quenching medium in circuit breakers?  
a) Need periodical replacement.  
b) Risk of formation of explosive mixture with air  
c) Possibility of causing fire hazards  
d) All of the above
- 6) In axial blast type of CB, expansion of air takes place from \_\_\_\_\_.  
a) High pressure to low pressure  
b) Low pressure to high pressure  
c) Always in high pressure  
d) Always in low pressure



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Set **Q**

**Fourth Y. (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Switchgear & Protection**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four (4x4=16) 16**

- State the desirable qualities of protective scheme?
- Explain static overcurrent relay with neat diagram.
- What are the different types of fuse? Explain construction and operation of HRC fuse with neat diagram.
- Explain the following terms
  - Pick up current
  - Current Setting
  - Plug setting Multiplier
  - Time setting multiplier
- Explain how impedance relay is used for distance protection? Draw its characteristics on R-X diagram.
- Describe microprocessor based impedance relay with block diagram.

**Q.3 Solve any two (6x2=12) 12**

- Determine the time of operation of an IDMT relay rating 5A and having setting of 125% and TSM=0.5. The relay is connected through C.T. of 400/5A. The fault current is 4000A. The operating time for PSM of 8 is 3.2 Second.
- With a neat sketch explain electromagnetic attraction relay.
- Explain how admittance relay is used for distance protection? Draw its characteristics on R-X diagram.

**Section – II**

**Q.4 Solve any four (4x4=16) 16**

- Explain construction & operation of buchholz relay with neat diagram.
- Explain protection of generator against motoring action.
- Explain high resistance interruption method of arc in circuit breaker.
- Explain the following terms in case of circuit breaker
  - Restriking voltage
  - Recovery voltage
- With neat sketch explain construction & operation of air blast circuit breaker.
- With neat sketch explain metal oxide ZnO arrestors.

**Q.5 Solve any two (6x2=12) 12**

- Explain protection of induction motor for different faults.
- Explain construction, principle and operation of oil circuit breaker with neat diagram.
- Explain the phenomenon of current chopping in circuit breaker.

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**Fourth Y. (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Switchgear & Protection**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) By using low resistance method for arc extension what is the value of arc resistance?
  - a) Arc resistance is zero
  - b) Arc resistance is high
  - c) Arc resistance is low
  - d) Arc resistance is very high
- 2) What is are the main disadvantage of using oil as the quenching medium is the circuit breakers?
  - a) Need periodical replacement.
  - b) Risk of formation of explosive mixture with air
  - c) Possibility of causing fire hazards
  - d) All of the above
- 3) In axial blast type of CB, expansion of air takes place from .
  - a) High pressure to low pressure
  - b) Low pressure to high pressure
  - c) Always in high pressure
  - d) Always in low pressure
- 4) The over-voltage surges in power systems may be caused by
  - a) Lightning
  - b) Switching
  - c) Resonance
  - d) Any of the above.
- 5) The most efficient torque producing actuating structure for the induction type relays is
  - a) Shaded pole structure
  - b) Watt hour meter structure
  - c) Induction cup structure
  - d) Single induction loop structure
- 6) What is the purpose of back up protection?
  - a) To increase the speed
  - b) To increase the reach
  - c) To leave no blind spot
  - d) To guard against failure of primary
- 7) Interruption of large currents by relay require
  - a) Arc suppressing blow out coils
  - b) Wide separation of the opened contacts
  - c) High speed opening of contacts
  - d) All of the above

- 8) Plug setting of an electromagnetic relay can be altered by varying
- a) Number of ampere turns
  - b) Air gap of magnetic path
  - c) Adjustable back stop
  - d) None of these
- 9) The material used for fuse must have
- a) Low melting point and high resistance
  - b) Low melting point and low resistance
  - c) High melting point and low resistance
  - d) Low melting point and any resistance
- 10) The relay best suited for phase fault relaying for medium transmission lines is:
- a) Mho relay
  - b) Reactance relay
  - c) Impedance relay
  - d) None of the above
- 11) A differential relay measures the vector difference between
- a) Two currents
  - b) Two voltages
  - c) Two or more similar electrical quantities
  - d) None of the above
- 12) The delay fuses are used for the protection of \_\_\_\_.
- a) Motors
  - b) Power outlet circuits
  - c) Fluorescent lamps
  - d) Light circuits
- 13) For which of the following protection from negative sequence currents is provided?
- a) Generators
  - b) Motors
  - c) Transmission line
  - d) Transformers
- 14) Why is it difficult to interrupt a capacitive circuit?
- a) The current has a leading power factor
  - b) The restriking voltage can be high
  - c) Current magnitude is very small
  - d) Stored energy in the capacitor is very high



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Set **R**

**Fourth Y. (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Switchgear & Protection**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four (4x4=16) 16**

- State the desirable qualities of protective scheme?
- Explain static overcurrent relay with neat diagram.
- What are the different types of fuse? Explain construction and operation of HRC fuse with neat diagram.
- Explain the following terms
  - Pick up current
  - Current Setting
  - Plug setting Multiplier
  - Time setting multiplier
- Explain how impedance relay is used for distance protection? Draw its characteristics on R-X diagram.
- Describe microprocessor based impedance relay with block diagram.

**Q.3 Solve any two (6x2=12) 12**

- Determine the time of operation of an IDMT relay rating 5A and having setting of 125% and TSM=0.5. The relay is connected through C.T. of 400/5A. The fault current is 4000A. The operating time for PSM of 8 is 3.2 Second.
- With a neat sketch explain electromagnetic attraction relay.
- Explain how admittance relay is used for distance protection? Draw its characteristics on R-X diagram.

**Section – II**

**Q.4 Solve any four (4x4=16) 16**

- Explain construction & operation of buchholz relay with neat diagram.
- Explain protection of generator against motoring action.
- Explain high resistance interruption method of arc in circuit breaker.
- Explain the following terms in case of circuit breaker
  - Restriking voltage
  - Recovery voltage
- With neat sketch explain construction & operation of air blast circuit breaker.
- With neat sketch explain metal oxide ZnO arrestors.

**Q.5 Solve any two (6x2=12) 12**

- Explain protection of induction motor for different faults.
- Explain construction, principle and operation of oil circuit breaker with neat diagram.
- Explain the phenomenon of current chopping in circuit breaker.

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## Max. Marks: 70

Marks: 14

## 14

- Page 10 of 12

- 7) What are the main disadvantages of using oil as the quenching medium in circuit breakers?
- a) Need periodical replacement.
  - b) Risk of formation of explosive mixture with air
  - c) Possibility of causing fire hazards
  - d) All of the above
- 8) In axial blast type of CB, expansion of air takes place from .
- a) High pressure to low pressure
  - b) Low pressure to high pressure
  - c) Always in high pressure
  - d) Always in low pressure
- 9) The over-voltage surges in power systems may be caused by
- a) Lightning
  - b) Switching
  - c) Resonance
  - d) Any of the above.
- 10) The most efficient torque producing actuating structure for the induction type relays is
- a) Shaded pole structure
  - b) Watt hour meter structure
  - c) Induction cup structure
  - d) Single induction loop structure
- 11) What is the purpose of back up protection?
- a) To increase the speed
  - b) To increase the reach
  - c) To leave no blind spot
  - d) To guard against failure of primary
- 12) Interruption of large currents by relay requires
- a) Arc suppressing blow out coils
  - b) Wide separation of the opened contacts
  - c) High speed opening of contacts
  - d) All of the above
- 13) Plug setting of an electromagnetic relay can be altered by varying
- a) Number of ampere turns
  - b) Air gap of magnetic path
  - c) Adjustable back stop
  - d) None of these
- 14) The material used for fuse must have
- a) Low melting point and high resistance
  - b) Low melting point and low resistance
  - c) High melting point and low resistance
  - d) Low melting point and any resistance

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Set **S**

**Fourth Y. (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Switchgear & Protection**

Day & Date: Tuesday, 07-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four (4x4=16) 16**

- State the desirable qualities of protective scheme?
- Explain static overcurrent relay with neat diagram.
- What are the different types of fuse? Explain construction and operation of HRC fuse with neat diagram.
- Explain the following terms
  - Pick up current
  - Current Setting
  - Plug setting Multiplier
  - Time setting multiplier
- Explain how impedance relay is used for distance protection? Draw its characteristics on R-X diagram.
- Describe microprocessor based impedance relay with block diagram.

**Q.3 Solve any two (6x2=12) 12**

- Determine the time of operation of an IDMT relay rating 5A and having setting of 125% and TSM=0.5. The relay is connected through C.T. of 400/5A. The fault current is 4000A. The operating time for PSM of 8 is 3.2 Second.
- With a neat sketch explain electromagnetic attraction relay.
- Explain how admittance relay is used for distance protection? Draw its characteristics on R-X diagram.

**Section – II**

**Q.4 Solve any four (4x4=16) 16**

- Explain construction & operation of buchholz relay with neat diagram.
- Explain protection of generator against motoring action.
- Explain high resistance interruption method of arc in circuit breaker.
- Explain the following terms in case of circuit breaker
  - Restriking voltage
  - Recovery voltage
- With neat sketch explain construction & operation of air blast circuit breaker.
- With neat sketch explain metal oxide ZnO arrestors.

**Q.5 Solve any two (6x2=12) 12**

- Explain protection of induction motor for different faults.
- Explain construction, principle and operation of oil circuit breaker with neat diagram.
- Explain the phenomenon of current chopping in circuit breaker.

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Set **P**

**Fourth Year (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Energy Audit and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options.**

**14**

- 1) Infrared thermometer is used to measure \_\_\_\_\_.  
 a) Surface temperature                      b) Flame temperature  
 c) Flue gas temperature                      d) Hot water temperature
- 2) Phase advancers are used to improve the power factor of \_\_\_\_\_.  
 a) Induction motors                      b) Induction generators  
 c) Synchronous motors                      d) Synchronous generators
- 3) Reactive power is measured in terms of \_\_\_\_\_.  
 a) kW                      b) kVA  
 c) kVAR                      d) None of these
- 4) Sankey diagram is an useful tool to represent \_\_\_\_\_.  
 a) Financial strength of the company  
 b) management philosophy  
 c) Input and output energy flow  
 d) human resource strength of the company
- 5) Particles that participate in the strong nuclear interaction are called \_\_\_\_\_.  
 a) Neutrinos                      b) Hadrons  
 c) Leptons                      d) Electrons  
 e) Photons
- 6) Which one is a secondary form of energy?  
 a) Furnace oil                      b) natural gas  
 c) Electricity                      d) Coal
- 7) The objective of material and energy balance is to assess the \_\_\_\_\_.  
 a) input-output                      b) conversion efficiency  
 c) Losses                      d) all the above
- 8) Energy supplied by electricity, Q in kCal is equal to \_\_\_\_\_.  
 a) kWh x 8.6                      b) kWh x 86  
 c) kWh x 860                      d) None



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**Set P**

**Fourth Year (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Energy Audit and Management**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) What do you mean by energy security? Explain few strategies to ensure energy security of our country.
- b) Write the notes on force field analysis.
- c) With suitable examples explain various options available for load curve wave shaping in demand side management.
- d) Explain the role of automatic meter reading in utility energy management.
- e) Short note on SCADA.

**Q.3 Attempt any two.** **12**

- a) What is necessity of energy audit? Explain phases of energy audit.
- b) Explain working of automatic meter in utility energy management
- c) Discuss United Nations Framework Convention on Climate Change.

**Section - II**

**Q.4 Attempt any four.** **16**

- a) What are the principles of writing a report of energy audit?
- b) Enlist energy conservation opportunities in pumping system.
- c) What are the various costing techniques?
- d) Give the format of energy audit.
- e) Explain various energy conservation opportunities in diesel generator.

**Q.5 Attempt any two.** **12**

- a) What are the objectives of carrying out sensitivity analysis? And what are the different factors that are considered for the sensitivity analysis?
- b) Why it is important to reduce T and D losses? Discuss various methods for reducing technical losses
- c) Explain step wise procedure to carry out a detail energy audit.

**Fourth Year (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Energy Audit and Management**

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

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- 8) Infrared thermometer is used to measure \_\_\_\_\_.  
a) Surface temperature                      b) Flame temperature  
c) Flue gas temperature                      d) Hot water temperature
- 9) Phase advancers are used to improve the power factor of \_\_\_\_\_.  
a) Induction motors                      b) Induction generators  
c) Synchronous motors                      d) Synchronous generators
- 10) Reactive power is measured in terms of \_\_\_\_\_.  
a) kW                      b) kVA  
c) kVAR                      d) None of these
- 11) Sankey diagram is an useful tool to represent \_\_\_\_\_.  
a) Financial strength of the company  
b) management philosophy  
c) Input and output energy flow  
d) human resource strength of the company
- 12) Particles that participate in the strong nuclear interaction are called \_\_\_\_\_.  
a) Neutrinos                      b) Hadrons  
c) Leptons                      d) Electrons  
e) Photons
- 13) Which one is a secondary form of energy?  
a) Furnace oil                      b) natural gas  
c) Electricity                      d) Coal
- 14) The objective of material and energy balance is to assess the \_\_\_\_\_.  
a) input-output                      b) conversion efficiency  
c) Losses                      d) all the above

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**Set Q**

**Fourth Year (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Energy Audit and Management**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) What do you mean by energy security? Explain few strategies to ensure energy security of our country.
- b) Write the notes on force field analysis.
- c) With suitable examples explain various options available for load curve wave shaping in demand side management.
- d) Explain the role of automatic meter reading in utility energy management.
- e) Short note on SCADA.

**Q.3 Attempt any two.** **12**

- a) What is necessity of energy audit? Explain phases of energy audit.
- b) Explain working of automatic meter in utility energy management
- c) Discuss United Nations Framework Convention on Climate Change.

**Section - II**

**Q.4 Attempt any four.** **16**

- a) What are the principles of writing a report of energy audit?
- b) Enlist energy conservation opportunities in pumping system.
- c) What are the various costing techniques?
- d) Give the format of energy audit.
- e) Explain various energy conservation opportunities in diesel generator.

**Q.5 Attempt any two.** **12**

- a) What are the objectives of carrying out sensitivity analysis? And what are the different factors that are considered for the sensitivity analysis?
- b) Why it is important to reduce T and D losses? Discuss various methods for reducing technical losses
- c) Explain step wise procedure to carry out a detail energy audit.

**Fourth Year (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Energy Audit and Management**

Max. Marks: 70

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

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- 8) Sankey diagram is an useful tool to represent \_\_\_\_\_.  
a) Financial strength of the company  
b) management philosophy  
c) Input and output energy flow  
d) human resource strength of the company
- 9) Particles that participate in the strong nuclear interaction are called \_\_\_\_\_.  
a) Neutrinos  
b) Hadrons  
c) Leptons  
d) Electrons  
e) Photons
- 10) Which one is a secondary form of energy?  
a) Furnace oil  
b) natural gas  
c) Electricity  
d) Coal
- 11) The objective of material and energy balance is to assess the \_\_\_\_\_.  
a) input-output  
b) conversion efficiency  
c) Losses  
d) all the above
- 12) Energy supplied by electricity, Q in kCal is equal to \_\_\_\_\_.  
a) kWh x 8.6  
b) kWh x 86  
c) kWh x 860  
d) None
- 13) A moderator is used to slow \_\_\_\_\_.  
a) Proton  
b) Alpha particles  
c) Neutron  
d) Beta particle
- 14) The force field analysis in energy action planning deals with barrier having \_\_\_\_\_.  
a) Positive force only  
b) Negative force only  
c) Both negative and positive force  
d) No force

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**Set R**

**Fourth Year (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Energy Audit and Management**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) What do you mean by energy security? Explain few strategies to ensure energy security of our country.
- b) Write the notes on force field analysis.
- c) With suitable examples explain various options available for load curve wave shaping in demand side management.
- d) Explain the role of automatic meter reading in utility energy management.
- e) Short note on SCADA.

**Q.3 Attempt any two.** **12**

- a) What is necessity of energy audit? Explain phases of energy audit.
- b) Explain working of automatic meter in utility energy management
- c) Discuss United Nations Framework Convention on Climate Change.

**Section - II**

**Q.4 Attempt any four.** **16**

- a) What are the principles of writing a report of energy audit?
- b) Enlist energy conservation opportunities in pumping system.
- c) What are the various costing techniques?
- d) Give the format of energy audit.
- e) Explain various energy conservation opportunities in diesel generator.

**Q.5 Attempt any two.** **12**

- a) What are the objectives of carrying out sensitivity analysis? And what are the different factors that are considered for the sensitivity analysis?
- b) Why it is important to reduce T and D losses? Discuss various methods for reducing technical losses
- c) Explain step wise procedure to carry out a detail energy audit.

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Set **S**

**Fourth Year (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Energy Audit and Management**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the options.**

**14**

- 1) Which one is a secondary form of energy?
  - a) Furnace oil
  - b) natural gas
  - c) Electricity
  - d) Coal
- 2) The objective of material and energy balance is to assess the \_\_\_\_\_.
  - a) input-output
  - b) conversion efficiency
  - c) Losses
  - d) all the above
- 3) Energy supplied by electricity, Q in kCal is equal to \_\_\_\_\_.
  - a) kWh x 8.6
  - b) kWh x 86
  - c) kWh x 860
  - d) None
- 4) A moderator is used to slow \_\_\_\_\_.
  - a) Proton
  - b) Alpha particles
  - c) Neutron
  - d) Beta particle
- 5) The force field analysis in energy action planning deals with barrier having \_\_\_\_\_.
  - a) Positive force only
  - b) Negative force only
  - c) Both negative and positive force
  - d) No force
- 6) The various types of the instruments, which requires during audit need to be \_\_\_\_\_.
  - a) Easy to carry
  - b) easy to operate
  - c) Inexpensive
  - d) all a) to c)
- 7) The current flowing through the resistance is given by \_\_\_\_\_.
  - a)  $I \cos \phi$
  - b)  $I \sin \phi$
  - c)  $I \tan \phi$
  - d)  $I \cot \phi$
- 8) Acid rain is caused by the release of the following components from combustion of fuels \_\_\_\_\_.
  - a) SO<sub>x</sub> and NO<sub>x</sub>
  - b) SO<sub>x</sub> and CO<sub>2</sub>
  - c) CO<sub>2</sub> and NO<sub>x</sub>
  - d) H<sub>2</sub>O

- 9) Find out the 'odd' among the following choices for fuel substitution for industrial sector of India \_\_\_\_\_.  
a) LDO with LSHS  
b) Coal with rice husk  
c) Natural gas for fertilizer plant  
d) LPG for soft coke
- 10) Infrared thermometer is used to measure \_\_\_\_\_.  
a) Surface temperature  
b) Flame temperature  
c) Flue gas temperature  
d) Hot water temperature
- 11) Phase advancers are used to improve the power factor of \_\_\_\_\_.  
a) Induction motors  
b) Induction generators  
c) Synchronous motors  
d) Synchronous generators
- 12) Reactive power is measured in terms of \_\_\_\_\_.  
a) kW  
b) kVA  
c) kVAR  
d) None of these
- 13) Sankey diagram is an useful tool to represent \_\_\_\_\_.  
a) Financial strength of the company  
b) management philosophy  
c) Input and output energy flow  
d) human resource strength of the company
- 14) Particles that participate in the strong nuclear interaction are called \_\_\_\_\_.  
a) Neutrinos  
b) Hadrons  
c) Leptons  
d) Electrons  
e) Photons

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**Set S**

**Fourth Year (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Energy Audit and Management**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) What do you mean by energy security? Explain few strategies to ensure energy security of our country.
- b) Write the notes on force field analysis.
- c) With suitable examples explain various options available for load curve wave shaping in demand side management.
- d) Explain the role of automatic meter reading in utility energy management.
- e) Short note on SCADA.

**Q.3 Attempt any two.** **12**

- a) What is necessity of energy audit? Explain phases of energy audit.
- b) Explain working of automatic meter in utility energy management
- c) Discuss United Nations Framework Convention on Climate Change.

**Section - II**

**Q.4 Attempt any four.** **16**

- a) What are the principles of writing a report of energy audit?
- b) Enlist energy conservation opportunities in pumping system.
- c) What are the various costing techniques?
- d) Give the format of energy audit.
- e) Explain various energy conservation opportunities in diesel generator.

**Q.5 Attempt any two.** **12**

- a) What are the objectives of carrying out sensitivity analysis? And what are the different factors that are considered for the sensitivity analysis?
- b) Why it is important to reduce T and D losses? Discuss various methods for reducing technical losses
- c) Explain step wise procedure to carry out a detail energy audit.



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Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.

Marks: 14

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Digital Signal Processing**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four of the following. 16**

- a) What is the relation between DFT and z transform?
- b) Explain DFT as linear transformation.
- c) Discuss the properties of DFT.
- d) Compare DIT and DIF.
- e) Discuss the properties of Discrete wavelet Transform.

**Q.3 Attempt any two of the following. 12**

- a) Explain frequency analysis of signals using DFT.
- b) Explain Discrete wavelet Transform in detail.
- c) Explain DSP architecture.

**Section – II**

**Q.4 Attempt any four of the following. 16**

- a) What are the advantages of FIR filter?
- b) Why rectangular window are not used in FIR filter design using window method?
- c) What is Bilinear Transformation?
- d) Distinguish between FIR and IIR Filters.
- e) Compare Digital and analog filters.

**Q.5 Attempt any two of the following. 12**

- a) Explain LMS algorithm.
- b) Explain the method of design of IIR filters using bilinear transform method.
- c) Why Kaiser window is most used for designing FIR Filter?

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- 9) In DIT, the data  $x(n)$  is stored in \_\_\_\_\_ order.  
a) Reversed order                      b) Bit reversal  
c) Non-shuffled                        d) None
- 10) FFT algorithm calculates \_\_\_\_\_.  
a) DTFT                                      b) DFT  
c) DCT                                        d) DST
- 11) The number of multiplication needed in FFT calculation of 32 point sequence are \_\_\_\_\_.  
a) 80                                              b) 1024  
c) 32                                                d) 100
- 12) For DIF FFT algorithm \_\_\_\_\_.  
a) Input sequence is in natural order  
b) Input sequence is in bit reversal order  
c) Output sequence is in natural order  
d) Both a & c
- 13) The number of multiplications needed in DFT calculation of 64 point sequence is \_\_\_\_\_.  
a) 4096                                              b) 192  
c) 64                                                 d) 1000
- 14) The FFT becomes more efficient because of \_\_\_\_\_ property of twiddle factor \_\_\_\_\_.  
a) Symmetry                                      b) Periodicity  
c) Both                                                d) None

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Digital Signal Processing**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four of the following.** **16**

- a) What is the relation between DFT and z transform?
- b) Explain DFT as linear transformation.
- c) Discuss the properties of DFT.
- d) Compare DIT and DIF.
- e) Discuss the properties of Discrete wavelet Transform.

**Q.3 Attempt any two of the following.** **12**

- a) Explain frequency analysis of signals using DFT.
- b) Explain Discrete wavelet Transform in detail.
- c) Explain DSP architecture.

**Section – II**

**Q.4 Attempt any four of the following.** **16**

- a) What are the advantages of FIR filter?
- b) Why rectangular window are not used in FIR filter design using window method?
- c) What is Bilinear Transformation?
- d) Distinguish between FIR and IIR Filters.
- e) Compare Digital and analog filters.

**Q.5 Attempt any two of the following.** **12**

- a) Explain LMS algorithm.
- b) Explain the method of design of IIR filters using bilinear transform method.
- c) Why Kaiser window is most used for designing FIR Filter?

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Digital Signal Processing**

Day & Date: Thursday, 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) When analog Butterworth filter is converted to DT filter using impulse invariant technique then \_\_\_\_\_.  
 a) Aliasing can be eliminated  
 b) Aliasing is always present  
 c) Aliasing can be reduced by reducing T  
 d) Aliasing cannot be reduced by reducing T
- 2) Poles of Butterworth filter lies on \_\_\_\_\_.  
 a) Ellipse  
 b) Circle  
 c) Parabola  
 d) None
- 3) For same set of specifications \_\_\_\_\_.  
 a) FIR filter requires less filter coefficients than that of IIR filters  
 b) IIR filter requires less filter coefficients than that of FIR filter  
 c) Both require same filter coefficients  
 d) None of above
- 4) The linear phase realization structure is used to represent \_\_\_\_\_.  
 a) FIR System  
 b) IIR System  
 c) Both  
 d) None
- 5) DIT algorithm is related to \_\_\_\_\_.  
 a)  $X(k)$  shuffled  
 b)  $x(n)$  shuffled  
 c) Both  
 d) None of the above
- 6) In DIT, the data  $x(n)$  is stored in \_\_\_\_\_ order.  
 a) Reversed order  
 b) Bit reversal  
 c) Non-shuffled  
 d) None
- 7) FFT algorithm calculates \_\_\_\_\_.  
 a) DTFT  
 b) DFT  
 c) DCT  
 d) DST
- 8) The number of multiplication needed in FFT calculation of 32 point sequence are \_\_\_\_\_.  
 a) 80  
 b) 1024  
 c) 32  
 d) 100

- 9) For DIF FFT algorithm \_\_\_\_\_.
  - a) Input sequence is in natural order
  - b) Input sequence is in bit reversal order
  - c) Output sequence is in natural order
  - d) Both a & c
- 10) The number of multiplications needed in DFT calculation of 64 point sequence is \_\_\_\_\_.
  - a) 4096
  - b) 192
  - c) 64
  - d) 1000
- 11) The FFT becomes more efficient because of \_\_\_\_\_ property of twiddle factor \_\_\_\_\_.
  - a) Symmetry
  - b) Periodicity
  - c) Both
  - d) None
- 12) A casual and stable IIR filter cannot have linear phase.
  - a) True
  - b) False
- 13) In Butterworth filter transition band is \_\_\_\_\_.
  - a) High
  - b) Less
  - c) Can not be defined
  - d) None
- 14) IIR filter design is based on \_\_\_\_\_ filter design.
  - a) Analog
  - b) Discrete Time
  - c) Digital
  - d) None



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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Digital Signal Processing**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four of the following. 16**

- a) What is the relation between DFT and z transform?
- b) Explain DFT as linear transformation.
- c) Discuss the properties of DFT.
- d) Compare DIT and DIF.
- e) Discuss the properties of Discrete wavelet Transform.

**Q.3 Attempt any two of the following. 12**

- a) Explain frequency analysis of signals using DFT.
- b) Explain Discrete wavelet Transform in detail.
- c) Explain DSP architecture.

**Section – II**

**Q.4 Attempt any four of the following. 16**

- a) What are the advantages of FIR filter?
- b) Why rectangular window are not used in FIR filter design using window method?
- c) What is Bilinear Transformation?
- d) Distinguish between FIR and IIR Filters.
- e) Compare Digital and analog filters.

**Q.5 Attempt any two of the following. 12**

- a) Explain LMS algorithm.
- b) Explain the method of design of IIR filters using bilinear transform method.
- c) Why Kaiser window is most used for designing FIR Filter?

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## Max. Marks: 70

Marks: 14

## 14

- Page 10 of 12

- 9) The linear phase realization structure is used to represent \_\_\_\_\_.
  - a) FIR System
  - b) IIR System
  - c) Both
  - d) None
- 10) DIT algorithm is related to \_\_\_\_\_.
  - a)  $X(k)$  shuffled
  - b)  $x(n)$  shuffled
  - c) Both
  - d) None of the above
- 11) In DIT, the data  $x(n)$  is stored in \_\_\_\_\_ order.
  - a) Reversed order
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- 12) FFT algorithm calculates \_\_\_\_\_.
  - a) DTFT
  - b) DFT
  - c) DCT
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  - a) 80
  - b) 1024
  - c) 32
  - d) 100
- 14) For DIF FFT algorithm \_\_\_\_\_.
  - a) Input sequence is in natural order
  - b) Input sequence is in bit reversal order
  - c) Output sequence is in natural order
  - d) Both a & c

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**Fourth Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Digital Signal Processing**

Day & Date: Thursday, 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
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**Section – I**

**Q.2 Attempt any four of the following. 16**

- a) What is the relation between DFT and z transform?
- b) Explain DFT as linear transformation.
- c) Discuss the properties of DFT.
- d) Compare DIT and DIF.
- e) Discuss the properties of Discrete wavelet Transform.

**Q.3 Attempt any two of the following. 12**

- a) Explain frequency analysis of signals using DFT.
- b) Explain Discrete wavelet Transform in detail.
- c) Explain DSP architecture.

**Section – II**

**Q.4 Attempt any four of the following. 16**

- a) What are the advantages of FIR filter?
- b) Why rectangular window are not used in FIR filter design using window method?
- c) What is Bilinear Transformation?
- d) Distinguish between FIR and IIR Filters.
- e) Compare Digital and analog filters.

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- a) Explain LMS algorithm.
- b) Explain the method of design of IIR filters using bilinear transform method.
- c) Why Kaiser window is most used for designing FIR Filter?

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**Fourth. Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Programmable Logic Control and SCADA**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The PLC was invented by \_\_\_\_\_.
  - a) Bills Gates
  - b) Dick Morley
  - c) Bill Landis
  - d) Tod Cunningham
- 2) PLCs are designed for use in the control of a wide variety of manufacturing machines and systems \_\_\_\_\_.
  - a) Special-Purpose Industrial Computers
  - b) Personal computers
  - c) Electromechanical systems
  - d) All of the above
- 3) PLC stands for \_\_\_\_\_.
  - a) Programmable Logo Controller
  - b) Programmed Latching Circuit
  - c) Programmable Logic Controller
  - d) Pneumatic Latching Circuit
- 4) SCADA system is \_\_\_\_\_.
  - a) Software
  - b) Hardware
  - c) Combination of Software and Hardware
  - d) None of the above
- 5) The current generation of SCADA uses \_\_\_\_\_ architecture.
  - a) Networked
  - b) Monolithic
  - c) Distributed
  - d) All of the above
- 6) Data Collection and Data Transfer is the function of \_\_\_\_\_.
  - a) SCADA software
  - b) SCADA hardware
  - c) a) and b)
  - d) None of the above

The diagram shows a series circuit. It starts with a vertical line on the left labeled  $L_1$ . This line connects to a horizontal line. On this horizontal line, there is a switch labeled 'A' (represented by two parallel diagonal lines). To the right of switch 'A' is a segment of the wire labeled '1'. This segment leads to another switch labeled 'B' (also represented by two parallel diagonal lines). To the right of switch 'B' is a segment of the wire labeled '2'. This segment leads to a lamp, represented by a circle with a cross inside. Finally, the circuit completes by connecting to a vertical line on the right labeled  $L_2$ .

- Page 2 of 12

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**Fourth. Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Programmable Logic Control and SCADA**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) State and explain advantages and disadvantages of PLC.
- b) Explain Central Processing Unit of PLC.
- c) What is ladder diagram? How it is different than the normal circuit diagram?
- d) Explain scan cycle in detail.
- e) Write a short note on input module.
- f) Explain Variable Speed (Variable Frequency) AC motor drive.

**Q.3 Solve any two.** **12**

- a) What is tuning of PID controller? Explain PID tuning methods in detail.
- b) This is an alarm system. There are four hazard inputs to the alarm system A,B,C,D that go on as some operational malfunction occurs.  
The system operates as follow:
  - i) If any one inputs are ON, nothing happen.
  - ii) If any two inputs are ON, a red pilot light goes on.
  - iii) If any three inputs are ON, an alarm siren sounds.
  - iv) If all four are ON, the fire department is notified.Develop Gate Logic, PLC Ladder logic and Relay Logic for alarm system.
- c) Explain input on/off Switching devices & analog input devices.

**Section – II**

**Q.4 Solve any four.** **16**

- a) Explain Device Net Protocol in detail.
- b) Explain Profibus Protocol System.
- c) Explain IEC61850 layered architecture protocol.
- d) State advantages and disadvantages of SCADA System.
- e) Draw and explain SCADA architecture in detail.
- f) Explain:
  - 1) Human Machine Interface
  - 2) Master terminal Unit
  - 3) Remote Terminal Unit

**Q.5 Solve any two.** **12**

- a) Explain how SCADA system is used in electric power generation.
- b) Draw and explain SCADA system in water purification system.
- c) Explain seven layers of OSI model and their functions. Compare OSI Model with TCP/IP Model.

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Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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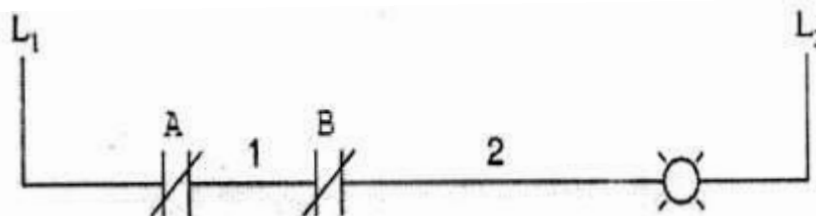
Marks: 14

14

- Page 4 of 12



- 9) PLCs are designed for use in the control of a wide variety of manufacturing machines and systems \_\_\_\_\_.  
 a) Special-Purpose Industrial Computers  
 b) Personal computers  
 c) Electromechanical systems  
 d) All of the above
- 10) PLC stands for \_\_\_\_\_.  
 a) Programmable Logo Controller  
 b) Programmed Latching Circuit  
 c) Programmable Logic Controller  
 d) Pneumatic Latching Circuit
- 11) SCADA system is \_\_\_\_\_.  
 a) Software  
 b) Hardware  
 c) Combination of Software and Hardware  
 d) None of the above
- 12) The current generation of SCADA uses \_\_\_\_\_ architecture.  
 a) Networked  
 b) Monolithic  
 c) Distributed  
 d) All of the above
- 13) Data Collection and Data Transfer is the function of \_\_\_\_\_.  
 a) SCADA software  
 b) SCADA hardware  
 c) a) and b)  
 d) None of the above
- 14) Figure shows the ladder logic for \_\_\_\_\_.



- a) NOR Gate  
 b) EX-NOR Gate  
 c) EX-OR Gate  
 d) NAND Gate

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**Fourth. Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Programmable Logic Control and SCADA**

Day & Date: Thursday 09-02-2023  
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Max. Marks: 56

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**Section – I**

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  - ii) If any two inputs are ON, a red pilot light goes on.
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  - iv) If all four are ON, the fire department is notified.
 Develop Gate Logic, PLC Ladder logic and Relay Logic for alarm system.
- c) Explain input on/off Switching devices & analog input devices.

**Section – II**

**Q.4 Solve any four.** **16**

- a) Explain Device Net Protocol in detail.
- b) Explain Profibus Protocol System.
- c) Explain IEC61850 layered architecture protocol.
- d) State advantages and disadvantages of SCADA System.
- e) Draw and explain SCADA architecture in detail.
- f) Explain:
  - 1) Human Machine Interface
  - 2) Master terminal Unit
  - 3) Remote Terminal Unit

**Q.5 Solve any two.** **12**

- a) Explain how SCADA system is used in electric power generation.
- b) Draw and explain SCADA system in water purification system.
- c) Explain seven layers of OSI model and their functions. Compare OSI Model with TCP/IP Model.

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**Fourth. Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Programmable Logic Control and SCADA**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

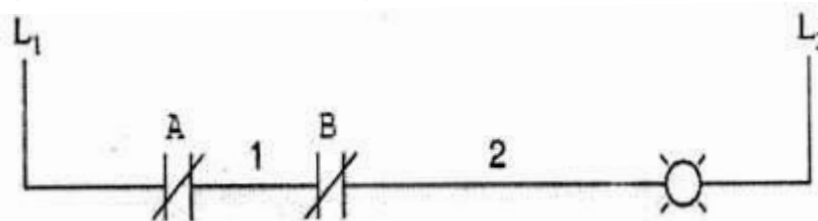
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The integral control \_\_\_\_\_.
  - a) Increases the steady state error
  - b) Decreases the steady state error
  - c) Increases the noise and stability
  - d) Decreases the damping coefficient
- 2) In TCP/IP model layer No. 2 consist of \_\_\_\_\_.
  - a) Application
  - b) Transport
  - c) Internet
  - d) Network Access
- 3) The important function of SCADA is \_\_\_\_\_.
  - a) Data Acquisition
  - b) Alarm processing
  - c) Information Display
  - d) All the above
- 4) \_\_\_\_\_ who monitor the SCADA system and perform supervisory control functions for the remote plant.
  - a) Operator
  - b) MTU
  - c) RTU
  - d) Communications
- 5) The PLC was invented by \_\_\_\_\_.
  - a) Bills Gates
  - b) Dick Morley
  - c) Bill Landis
  - d) Tod Cunningham
- 6) PLCs are designed for use in the control of a wide variety of manufacturing machines and systems \_\_\_\_\_.
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 a) Software  
 b) Hardware  
 c) Combination of Software and Hardware  
 d) None of the above
- 9) The current generation of SCADA uses \_\_\_\_\_ architecture.  
 a) Networked  
 b) Monolithic  
 c) Distributed  
 d) All of the above
- 10) Data Collection and Data Transfer is the function of \_\_\_\_\_.  
 a) SCADA software  
 b) SCADA hardware  
 c) a) and b)  
 d) None of the above
- 11) Figure shows the ladder logic for \_\_\_\_\_.



- a) NOR Gate  
 b) EX-NOR Gate  
 c) EX-OR Gate  
 d) NAND Gate
- 12) Which layer 4 protocols is used for a Telnet connection?  
 a) IP  
 b) TCP  
 c) TCP/IP  
 d) UDP
- 13) OSI stands for \_\_\_\_\_.  
 a) Open system interconnection  
 b) Operating system interface  
 c) Optical service implementation  
 d) None of the above
- 14) Where is a hub specified in the OSI model?  
 a) Session layer  
 b) Physical layer  
 c) Data Link layer  
 d) Application layer

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**Fourth. Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Programmable Logic Control and SCADA**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Solve any four.** **16**

- a) State and explain advantages and disadvantages of PLC.
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**Section – II**

**Q.4 Solve any four.** **16**

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**Fourth. Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Programmable Logic Control and SCADA**

Day & Date: Thursday 09-02-2023  
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Max. Marks: 70

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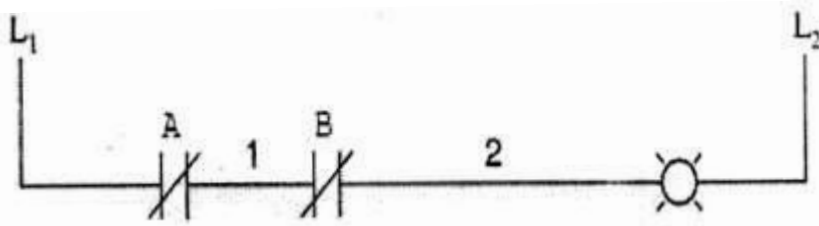
**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Data Collection and Data Transfer is the function of \_\_\_\_\_.  
 a) SCADA software                      b) SCADA hardware  
 c) a) and b)                              d) None of the above
- 2) Figure shows the ladder logic for \_\_\_\_\_.  


- a) NOR Gate                              b) EX-NOR Gate  
 c) EX-OR Gate                          d) NAND Gate
- 3) Which layer 4 protocols is used for a Telnet connection?  
 a) IP                                          b) TCP  
 c) TCP/IP                                  d) UDP
- 4) OSI stands for \_\_\_\_\_.  
 a) Open system interconnection  
 b) Operating system interface  
 c) Optical service implementation  
 d) None of the above
- 5) Where is a hub specified in the OSI model?  
 a) Session layer                          b) Physical layer  
 c) Data Link layer                        d) Application layer
- 6) The integral control \_\_\_\_\_.  
 a) Increases the steady state error  
 b) Decreases the steady state error  
 c) Increases the noise and stability  
 d) Decreases the damping coefficient



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**Fourth. Year (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Programmable Logic Control and SCADA**

Day & Date: Thursday 09-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) State and explain advantages and disadvantages of PLC.
- b) Explain Central Processing Unit of PLC.
- c) What is ladder diagram? How it is different than the normal circuit diagram?
- d) Explain scan cycle in detail.
- e) Write a short note on input module.
- f) Explain Variable Speed (Variable Frequency) AC motor drive.

**Q.3 Solve any two.** **12**

- a) What is tuning of PID controller? Explain PID tuning methods in detail.
- b) This is an alarm system. There are four hazard inputs to the alarm system A,B,C,D that go on as some operational malfunction occurs.  
 The system operates as follow:
  - i) If any one inputs are ON, nothing happen.
  - ii) If any two inputs are ON, a red pilot light goes on.
  - iii) If any three inputs are ON, an alarm siren sounds.
  - iv) If all four are ON, the fire department is notified.
 Develop Gate Logic, PLC Ladder logic and Relay Logic for alarm system.
- c) Explain input on/off Switching devices & analog input devices.

**Section – II**

**Q.4 Solve any four.** **16**

- a) Explain Device Net Protocol in detail.
- b) Explain Profibus Protocol System.
- c) Explain IEC61850 layered architecture protocol.
- d) State advantages and disadvantages of SCADA System.
- e) Draw and explain SCADA architecture in detail.
- f) Explain:
  - 1) Human Machine Interface
  - 2) Master terminal Unit
  - 3) Remote Terminal Unit

**Q.5 Solve any two.** **12**

- a) Explain how SCADA system is used in electric power generation.
- b) Draw and explain SCADA system in water purification system.
- c) Explain seven layers of OSI model and their functions. Compare OSI Model with TCP/IP Model.



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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**High Voltage Engineering**

Day & Date: Thursday 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The conventional direction of electric field is \_\_\_\_\_.  
 a) Positive to negative                      b) Negative to positive  
 c) No specific direction                      d) Direction cannot be determined
- 2) As compared to air the relative dielectric strength of Sulphur hexafluoride is nearly  
 a) 1.5 times                                      b) 2.5 times  
 c) 4.0 times                                      d) 5.0 times
- 3) Formative time lag depends on the mechanism of the avalanche growth in gap the formative time lag is usually  
 a) Much shorter than the statistical time lag  
 b) Much greater than the statistical time lag  
 c) Equal to the statistical time lag  
 d) None of these
- 4) For the high voltage conductors at high pressures, if the voltage is positive then the corona appears as a  
 a) Uniform bluish white sheath              b) Reddish glowing spots  
 c) Uniform greenish spots                      d) None of these
- 5) The intrinsic breakdown strength of solid dielectrics is about  
 a) 50 to 100 kV/mm                              b) 500 to 1000 kV/mm  
 c) 5 to 10 kV/mm                                  d) 1 to 5 kV/mm
- 6) Electrochemical breakdown & deterioration of insulating material is due to  
 a) Temperature rise  
 b) oxidation, hydrolysis or some other chemical action  
 c) Only due to hydrolysis and moisture effects  
 d) None of the above
- 7) The necessary condition for performing sphere gap test is  
 a) Should be between 0.7 and 0.8?  
 b) The length of gap should be smaller than radius of sphere  
 c) The length of gap should be 4 times greater than radius of sphere  
 d) An impulse wave of 50000 kV should be applied Wave front time

- 8) Van de Graff generators are useful for
- a) Very high voltage and low current applications
  - b) Very high voltage and high current applications
  - c) High voltage pulses only
  - d) Constant high voltage and current applications
- 9) The generating voltmeter is driven by \_\_\_\_\_ which \_\_\_\_\_ energy from measuring source:
- a) Constant speed motor, absorbs
  - b) Variable speed motor, doesn't absorb
  - c) Constant speed motor, doesn't absorb
  - d) Variable speed motor, absorbs
- 10) For the measurement of radio interference voltages, the detector circuit is provided with a measuring device to measure:
- a) Quasi-peak value
  - b) Peak value
  - c) Average value
  - d) All of the above
- 11) Impulse testing of transformers is done using
- a) Full wave standard impulse
  - b) Chopped wave standard impulse
  - c) Half wave standard impulse
  - d) only (a) and (b)
- 12) A small high-voltage laboratory usually will have
- a) ac, dc test sources with ratings less than 100 KV, 10kVA /KW and impulse of voltage 400 KV, 5 kJ
  - b) ac, dc test sources of 500 kV, 100 kVA/kW, and impulse of 1 MV 10 KJ
  - c) Ac voltage sources of 300 kV, 10 kVA, and impulse voltage of 1 MV, 15 KJ
  - d) Ac, dc sources only
- 13) The clearances normally adopted in by laboratories for ac and impulse voltages are
- a) 100 to 200 kv/m for ac and 500 kV/m for impulse
  - b) 300 kv/ m for ac and 500 kV/m for impulse
  - c) 30 kV/m for ac and 50 kV/m for impulse
  - d) 10 kV/m for ac and 50 kV/m for impulse
- 14) In routine test, the cable is tested by applying an ac voltage
- a) 2 times the rated value
  - b) 2.5 times the rated value
  - c) 3 times the rated value
  - d) 3.5 times the rated value

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**High Voltage Engineering**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- a) Explain estimation and control of electric stresses.
- b) Write a short note on Gas/Vacuum as insulators.
- c) State & derive Paschen's law and equation along with Explanations of V and Pd.
- d) Explain post breakdown phenomena in gases along with glow arc discharge from neat drawn figure.
- e) Describe characteristics and applications of the following three solid dielectrics
  - i) Paper and Board;
  - ii) Ceramic;
  - iii) Polyvinyl Chloride (PVC)
- f) Explain electrochemical breakdown and thermal breakdown.

**Q.3 Solve Any Two** **12**

- a) Explain post breakdown phenomena and applications.
- b) Write short note on Townsend's current growth equation and its secondary ionization process with current equation.
- c) Write short note on breakdown in solid dielectrics due to treeing and tracking.

**Section – II**

**Q.4 Solve Any Four** **16**

- a) Explain cockroft-walton multiplier.
- b) Explain resonant transformer, its principle and operation.
- c) Write a short note on Hall generators.
- d) Explain briefly various tests to be carried out on a bushing.
- e) Discuss the test facilities, activity and studies in high voltage laboratories.
- f) Write a short note on grounding of impulse testing laboratories.

**Q.5 Solve Any Two** **12**

- a) Define the terms impulse voltage, impulse flash over voltage, impulse puncture voltage, impulse ratio for flash over, impulse ratio for puncture.
- b) Write short note on analysis of impulse generator circuit of series R-L-C circuit.
- c) What is the necessary arrangement required for arrangement required for testing of insulators.

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**High Voltage Engineering**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Van de Graff generators are useful for
  - a) Very high voltage and low current applications
  - b) Very high voltage and high current applications
  - c) High voltage pulses only
  - d) Constant high voltage and current applications
- 2) The generating voltmeter is driven by \_\_\_\_\_ which \_\_\_\_\_ energy from measuring source:
  - a) Constant speed motor, absorbs
  - b) Variable speed motor, doesn't absorb
  - c) Constant speed motor, doesn't absorb
  - d) Variable speed motor, absorbs
- 3) For the measurement of radio interference voltages, the detector circuit is provided with a measuring device to measure:
  - a) Quasi-peak value
  - b) Peak value
  - c) Average value
  - d) All of the above
- 4) Impulse testing of transformers is done using
  - a) Full wave standard impulse
  - b) Chopped wave standard impulse
  - c) Half wave standard impulse
  - d) only (a) and (b)
- 5) A small high-voltage laboratory usually will have
  - a) ac, dc test sources with ratings less than 100 KV, 10kVA /KW and impulse of voltage 400 KV, 5 kJ
  - b) ac, dc test sources of 500 kV, 100 kVA/kW, and impulse of 1 MV 10 KJ
  - c) Ac voltage sources of 300 kV, 10 kVA, and impulse voltage of 1 MV, 15 KJ
  - d) Ac, dc sources only

- 6) The clearances normally adopted in by laboratories for ac and impulse voltages are
- a) 100 to 200 kV/m for ac and 500 kV/m for impulse
  - b) 300 kV/ m for ac and 500 kV/m for impulse
  - c) 30 kV/m for ac and 50 kV/m for impulse
  - d) 10 kV/m for ac and 50 kV/m for impulse
- 7) In routine test, the cable is tested by applying an ac voltage
- a) 2 times the rated value
  - b) 2.5 times the rated value
  - c) 3 times the rated value
  - d) 3.5 times the rated value
- 8) The conventional direction of electric field is \_\_\_\_.
- a) Positive to negative
  - b) Negative to positive
  - c) No specific direction
  - d) Direction cannot be determined
- 9) As compared to air the relative dielectric strength of Sulphur hexafluoride is nearly
- a) 1.5 times
  - b) 2.5 times
  - c) 4.0 times
  - d) 5.0 times
- 10) Formative time lag depends on the mechanism of the avalanche growth in gap the formative time lag is usually
- a) Much shorter than the statistical time lag
  - b) Much greater than the statistical time lag
  - c) Equal to the statistical time lag
  - d) None of these
- 11) For the high voltage conductors at high pressures, if the voltage is positive then the corona appears as a
- a) Uniform bluish white sheath
  - b) Reddish glowing spots
  - c) Uniform greenish spots
  - d) None of these
- 12) The intrinsic breakdown strength of solid dielectrics is about
- a) 50 to 100 kV/mm
  - b) 500 to 1000 kV/mm
  - c) 5 to 10 kV/mm
  - d) 1 to 5 kV/mm
- 13) Electrochemical breakdown & deterioration of insulating material is due to
- a) Temperature rise
  - b) oxidation, hydrolysis or some other chemical action
  - c) Only due to hydrolysis and moisture effects
  - d) None of the above
- 14) The necessary condition for performing sphere gap test is
- a) Should be between 0.7 and 0.8?
  - b) The length of gap should be smaller than radius of sphere
  - c) The length of gap should be 4 times greater than radius of sphere
  - d) An impulse wave of 50000 kV should be applied Wave front time

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**Set Q**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**High Voltage Engineering**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- a) Explain estimation and control of electric stresses.
- b) Write a short note on Gas/Vacuum as insulators.
- c) State & derive Paschen's law and equation along with Explanations of V and Pd.
- d) Explain post breakdown phenomena in gases along with glow arc discharge from neat drawn figure.
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  - ii) Ceramic;
  - iii) Polyvinyl Chloride (PVC)
- f) Explain electrochemical breakdown and thermal breakdown.

**Q.3 Solve Any Two** **12**

- a) Explain post breakdown phenomena and applications.
- b) Write short note on Townsend's current growth equation and its secondary ionization process with current equation.
- c) Write short note on breakdown in solid dielectrics due to treeing and tracking.

**Section – II**

**Q.4 Solve Any Four** **16**

- a) Explain cockroft-walton multiplier.
- b) Explain resonant transformer, its principle and operation.
- c) Write a short note on Hall generators.
- d) Explain briefly various tests to be carried out on a bushing.
- e) Discuss the test facilities, activity and studies in high voltage laboratories.
- f) Write a short note on grounding of impulse testing laboratories.

**Q.5 Solve Any Two** **12**

- a) Define the terms impulse voltage, impulse flash over voltage, impulse puncture voltage, impulse ratio for flash over, impulse ratio for puncture.
- b) Write short note on analysis of impulse generator circuit of series R-L-C circuit.
- c) What is the necessary arrangement required for arrangement required for testing of insulators.

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**High Voltage Engineering**

Day & Date: Thursday 09-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Impulse testing of transformers is done using
  - a) Full wave standard impulse
  - b) Chopped wave standard impulse
  - c) Half wave standard impulse
  - d) only (a) and (b)
- 2) A small high-voltage laboratory usually will have
  - a) ac, dc test sources with ratings less than 100 KV, 10kVA /KW and impulse of voltage 400 KV, 5 kJ
  - b) ac, dc test sources of 500 kV, 100 kVA/kW, and impulse of 1 MV 10 KJ
  - c) Ac voltage sources of 300 kV, 10 kVA, and impulse voltage of 1 MV, 15 KJ
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- 3) The clearances normally adopted in by laboratories for ac and impulse voltages are
  - a) 100 to 200 kv/m for ac and 500 kV/m for impulse
  - b) 300 kv/ m for ac and 500 kV/m for impulse
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  - d) 10 kV/m for ac and 50 kV/m for impulse
- 4) In routine test, the cable is tested by applying an ac voltage
 

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| a) 2 times the rated value | b) 2.5 times the rated value |
| c) 3 times the rated value | d) 3.5 times the rated value |
- 5) The conventional direction of electric field is \_\_\_\_\_.
 

|                          |                                   |
|--------------------------|-----------------------------------|
| a) Positive to negative  | b) Negative to positive           |
| c) No specific direction | d) Direction cannot be determined |
- 6) As compared to air the relative dielectric strength of Sulphur hexafluoride is nearly
 

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| a) 1.5 times | b) 2.5 times |
| c) 4.0 times | d) 5.0 times |

- 7) Formative time lag depends on the mechanism of the avalanche growth in gap the formative time lag is usually
- a) Much shorter than the statistical time lag
  - b) Much greater than the statistical time lag
  - c) Equal to the statistical time lag
  - d) None of these
- 8) For the high voltage conductors at high pressures, if the voltage is positive then the corona appears as a
- a) Uniform bluish white sheath
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  - d) None of these
- 9) The intrinsic breakdown strength of solid dielectrics is about
- a) 50 to 100 kV/mm
  - b) 500 to 1000 kV/mm
  - c) 5 to 10 kV/mm
  - d) 1 to 5 kV/mm
- 10) Electrochemical breakdown & deterioration of insulating material is due to
- a) Temperature rise
  - b) oxidation, hydrolysis or some other chemical action
  - c) Only due to hydrolysis and moisture effects
  - d) None of the above
- 11) The necessary condition for performing sphere gap test is
- a) Should be between 0.7 and 0.8?
  - b) The length of gap should be smaller than radius of sphere
  - c) The length of gap should be 4 times greater than radius of sphere
  - d) An impulse wave of 50000 kV should be applied Wave front time
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- a) Very high voltage and low current applications
  - b) Very high voltage and high current applications
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- 14) For the measurement of radio interference voltages, the detector circuit is provided with a measuring device to measure:
- a) Quasi-peak value
  - b) Peak value
  - c) Average value
  - d) All of the above



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**Set R**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**High Voltage Engineering**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- a) Explain estimation and control of electric stresses.
- b) Write a short note on Gas/Vacuum as insulators.
- c) State & derive Paschen's law and equation along with Explanations of V and Pd.
- d) Explain post breakdown phenomena in gases along with glow arc discharge from neat drawn figure.
- e) Describe characteristics and applications of the following three solid dielectrics
  - i) Paper and Board;
  - ii) Ceramic;
  - iii) Polyvinyl Chloride (PVC)
- f) Explain electrochemical breakdown and thermal breakdown.

**Q.3 Solve Any Two** **12**

- a) Explain post breakdown phenomena and applications.
- b) Write short note on Townsend's current growth equation and its secondary ionization process with current equation.
- c) Write short note on breakdown in solid dielectrics due to treeing and tracking.

**Section – II**

**Q.4 Solve Any Four** **16**

- a) Explain cockroft-walton multiplier.
- b) Explain resonant transformer, its principle and operation.
- c) Write a short note on Hall generators.
- d) Explain briefly various tests to be carried out on a bushing.
- e) Discuss the test facilities, activity and studies in high voltage laboratories.
- f) Write a short note on grounding of impulse testing laboratories.

**Q.5 Solve Any Two** **12**

- a) Define the terms impulse voltage, impulse flash over voltage, impulse puncture voltage, impulse ratio for flash over, impulse ratio for puncture.
- b) Write short note on analysis of impulse generator circuit of series R-L-C circuit.
- c) What is the necessary arrangement required for arrangement required for testing of insulators.

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**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**High Voltage Engineering**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Electrochemical breakdown & deterioration of insulating material is due to
  - a) Temperature rise
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- 5) For the measurement of radio interference voltages, the detector circuit is provided with a measuring device to measure:
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- 6) Impulse testing of transformers is done using
  - a) Full wave standard impulse
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- 7) A small high-voltage laboratory usually will have
- a) ac, dc test sources with ratings less than 100 KV, 10kVA /KW and impulse of voltage 400 KV, 5 kJ
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  - b) 300 kv/ m for ac and 500 kV/m for impulse
  - c) 30 kV/m for ac and 50 kV/m for impulse
  - d) 10 kV/m for ac and 50 kV/m for impulse
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- a) Uniform bluish white sheath
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- a) 50 to 100 kV/mm
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**Set S**

**Fourth Year (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**High Voltage Engineering**

Day & Date: Thursday 09-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve Any Four** **16**

- a) Explain estimation and control of electric stresses.
- b) Write a short note on Gas/Vacuum as insulators.
- c) State & derive Paschen's law and equation along with Explanations of V and Pd.
- d) Explain post breakdown phenomena in gases along with glow arc discharge from neat drawn figure.
- e) Describe characteristics and applications of the following three solid dielectrics
  - i) Paper and Board;
  - ii) Ceramic;
  - iii) Polyvinyl Chloride (PVC)
- f) Explain electrochemical breakdown and thermal breakdown.

**Q.3 Solve Any Two** **12**

- a) Explain post breakdown phenomena and applications.
- b) Write short note on Townsend's current growth equation and its secondary ionization process with current equation.
- c) Write short note on breakdown in solid dielectrics due to treeing and tracking.

**Section – II**

**Q.4 Solve Any Four** **16**

- a) Explain cockroft-walton multiplier.
- b) Explain resonant transformer, its principle and operation.
- c) Write a short note on Hall generators.
- d) Explain briefly various tests to be carried out on a bushing.
- e) Discuss the test facilities, activity and studies in high voltage laboratories.
- f) Write a short note on grounding of impulse testing laboratories.

**Q.5 Solve Any Two** **12**

- a) Define the terms impulse voltage, impulse flash over voltage, impulse puncture voltage, impulse ratio for flash over, impulse ratio for puncture.
- b) Write short note on analysis of impulse generator circuit of series R-L-C circuit.
- c) What is the necessary arrangement required for arrangement required for testing of insulators.

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- 10) The main objective of series compensation \_\_\_\_\_.  
a) It improves the power factor  
b) It reduces the fault currents  
c) Reduce the voltage drop over long distance  
d) None
- 11) TCSC is a \_\_\_\_\_.  
a) Shunt compensation device      b) Series compensation device  
c) Both a & b      d) None of the above
- 12) The Unified Power Flow Controller (UPFC) concept was proposed by \_\_\_\_\_.  
a) Gyugyi      b) Hingorani  
c) Ravichandrudu      d) Smith
- 13) The UPFC can control \_\_\_\_\_.  
a) Voltage      b) Impedance  
c) Phase angle      d) All the above
- 14) Control attributes of UPFC are \_\_\_\_\_.  
a) Active and reactive power control  
b) Voltage control  
c) VAR compensation  
d) All the above

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Quality & FACTS**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Answer any four** **16**
- a) Write short notes on harmonics and Inter-harmonics.
  - b) Explain Transients and Voltage Imbalance.
  - c) Explain the active filter to control harmonic distortion.
  - d) Computer Tools for Transients Analysis.
  - e) What are the International Standards of power quality?
- Q.3 Answer any Two** **12**
- a) With a neat diagram explain the CBEMA and ITI curve.
  - b) Explain Harmonic sources from Industrial loads.
  - c) With a neat diagram explain IEC flicker meter.

**Section – II**

- Q.4 Answer any four** **16**
- a) Explain Transient Stability Improvement.
  - b) Explain the hybrid phase angle regulator.
  - c) Explain the basic control of TCBR.
  - d) Explain the construction and working of TSC-TCR.
  - e) Explain the basic types of FACTS Controllers.
- Q.5 Answer any two** **12**
- a) Explain the working of SSSC with a diagram and waveforms.
  - b) Explain the UPFC back to back voltage source converter.
  - c) Differentiate between STATCOM and SVC.

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## Max. Marks: 70

Marks: 14

Page 4 of 12



- 9) The duration of voltage sag is less than \_\_\_\_\_.  
a) 20 min                                      b) 1 min  
c) 20 sec                                        d) 60 min
- 10) To describe the voltage harmonic distortion is used to \_\_\_\_\_.  
a) THD                                          b) TDD  
c) UTD                                          d) None of these
- 11) Fluorescent light are a popular choice of energy \_\_\_\_\_.  
a) saving                                         b) wasting  
c) Both a & b                                    d) None of these
- 12) Ballast is \_\_\_\_\_ limiting device.  
a) voltage                                        b) frequency  
c) current                                        d) None of these
- 13) Passive filter is used to control \_\_\_\_\_.  
a) voltage                                        b) frequency  
c) current                                        d) harmonics
- 14) Monitoring as part of an enhanced power quality service is the objective of power quality monitoring.  
a) True                                            b) False

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Quality & FACTS**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Answer any four** **16**
- a) Write short notes on harmonics and Inter-harmonics.
  - b) Explain Transients and Voltage Imbalance.
  - c) Explain the active filter to control harmonic distortion.
  - d) Computer Tools for Transients Analysis.
  - e) What are the International Standards of power quality?
- Q.3 Answer any Two** **12**
- a) With a neat diagram explain the CBEMA and ITI curve.
  - b) Explain Harmonic sources from Industrial loads.
  - c) With a neat diagram explain IEC flicker meter.

**Section – II**

- Q.4 Answer any four** **16**
- a) Explain Transient Stability Improvement.
  - b) Explain the hybrid phase angle regulator.
  - c) Explain the basic control of TCBR.
  - d) Explain the construction and working of TSC-TCR.
  - e) Explain the basic types of FACTS Controllers.
- Q.5 Answer any two** **12**
- a) Explain the working of SSSC with a diagram and waveforms.
  - b) Explain the UPFC back to back voltage source converter.
  - c) Differentiate between STATCOM and SVC.

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Quality & FACTS**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) TCSC is a \_\_\_\_\_.  
 a) Shunt compensation device      b) Series compensation device  
 c) Both a & b      d) None of the above
- 2) The Unified Power Flow Controller (UPFC) concept was proposed by \_\_\_\_\_.  
 a) Gyugyi      b) Hingorani  
 c) Ravichandrudu      d) Smith
- 3) The UPFC can control \_\_\_\_\_.  
 a) Voltage      b) Impedance  
 c) Phase angle      d) All the above
- 4) Control attributes of UPFC are \_\_\_\_\_.  
 a) Active and reactive power control  
 b) Voltage control  
 c) VAR compensation  
 d) All the above
- 5) Swell is an increase in the rms voltage or current between \_\_\_\_\_.  
 a) 1.1 and 1.8 pu      b) 1.2 and 2.8 pu  
 c) 3.1 and 1.3 pu      d) 2.1 and 5.8 pu
- 6) The duration of voltage sag is less than \_\_\_\_\_.  
 a) 20 min      b) 1 min  
 c) 20 sec      d) 60 min
- 7) To describe the voltage harmonic distortion is used to \_\_\_\_\_.  
 a) THD      b) TDD  
 c) UTD      d) None of these
- 8) Fluorescent light are a popular choice of energy \_\_\_\_\_.  
 a) saving      b) wasting  
 c) Both a & b      d) None of these
- 9) Ballast is \_\_\_\_\_ limiting device.  
 a) voltage      b) frequency  
 c) current      d) None of these

- 10) Passive filter is used to control \_\_\_\_\_.
  - a) voltage
  - b) frequency
  - c) current
  - d) harmonics
- 11) Monitoring as part of an enhanced power quality service is the objective of power quality monitoring.
  - a) True
  - b) False
- 12) Which are the shunt compensation devices?
  - a) TCSC
  - b) SSSC
  - c) UPFC
  - d) SVC
- 13) STATCOM stands for \_\_\_\_\_.
  - a) Static series controller
  - b) Static Shunt var converter
  - c) Static Synchronous Compensator
  - d) None of these
- 14) The main objective of series compensation \_\_\_\_\_.
  - a) It improves the power factor
  - b) It reduces the fault currents
  - c) Reduce the voltage drop over long distance
  - d) None

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Quality & FACTS**

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks  
2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Answer any four** **16**
- a) Write short notes on harmonics and Inter-harmonics.
  - b) Explain Transients and Voltage Imbalance.
  - c) Explain the active filter to control harmonic distortion.
  - d) Computer Tools for Transients Analysis.
  - e) What are the International Standards of power quality?
- Q.3 Answer any Two** **12**
- a) With a neat diagram explain the CBEMA and ITI curve.
  - b) Explain Harmonic sources from Industrial loads.
  - c) With a neat diagram explain IEC flicker meter.

**Section – II**

- Q.4 Answer any four** **16**
- a) Explain Transient Stability Improvement.
  - b) Explain the hybrid phase angle regulator.
  - c) Explain the basic control of TCBR.
  - d) Explain the construction and working of TSC-TCR.
  - e) Explain the basic types of FACTS Controllers.
- Q.5 Answer any two** **12**
- a) Explain the working of SSSC with a diagram and waveforms.
  - b) Explain the UPFC back to back voltage source converter.
  - c) Differentiate between STATCOM and SVC.

Day & Date: Tuesday, 14-02-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

- 1) Passive filter is used to control \_\_\_\_\_.  
a) voltage  
b) frequency  
c) current  
d) harmonics
- 2) Monitoring as part of an enhanced power quality service is the objective of power quality monitoring.  
a) True  
b) False
- 3) Which are the shunt compensation devices?  
a) TCSC  
b) SSSC  
c) UPFC  
d) SVC
- 4) STATCOM stands for \_\_\_\_\_.  
a) Static series controller  
b) Static Shunt var converter  
c) Static Synchronous Compensator  
d) None of these
- 5) The main objective of series compensation \_\_\_\_\_.  
a) It improves the power factor  
b) It reduces the fault currents  
c) Reduce the voltage drop over long distance  
d) None
- 6) TCSC is a \_\_\_\_\_.  
a) Shunt compensation device  
b) Series compensation device  
c) Both a & b  
d) None of the above
- 7) The Unified Power Flow Controller (UPFC) concept was proposed by \_\_\_\_\_.  
a) Gyugyi  
b) Hingorani  
c) Ravichandrudu  
d) Smith
- 8) The UPFC can control \_\_\_\_\_.  
a) Voltage  
b) Impedance  
c) Phase angle  
d) All the above

- 9) Control attributes of UPFC are \_\_\_\_\_.  
a) Active and reactive power control  
b) Voltage control  
c) VAR compensation  
d) All the above
- 10) Swell is an increase in the rms voltage or current between \_\_\_\_\_.  
a) 1.1 and 1.8 pu  
b) 1.2 and 2.8 pu  
c) 3.1 and 1.3 pu  
d) 2.1 and 5.8 pu
- 11) The duration of voltage sag is less than \_\_\_\_\_.  
a) 20 min  
b) 1 min  
c) 20 sec  
d) 60 min
- 12) To describe the voltage harmonic distortion is used to \_\_\_\_\_.  
a) THD  
b) TDD  
c) UTD  
d) None of these
- 13) Fluorescent light are a popular choice of energy \_\_\_\_\_.  
a) saving  
b) wasting  
c) Both a & b  
d) None of these
- 14) Ballast is \_\_\_\_\_ limiting device.  
a) voltage  
b) frequency  
c) current  
d) None of these

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power Quality & FACTS**

Day & Date: Tuesday, 14-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 2) Assume suitable data wherever needed and mention it clearly.

**Section – I**

- Q.2 Answer any four** **16**
- Write short notes on harmonics and Inter-harmonics.
  - Explain Transients and Voltage Imbalance.
  - Explain the active filter to control harmonic distortion.
  - Computer Tools for Transients Analysis.
  - What are the International Standards of power quality?
- Q.3 Answer any Two** **12**
- With a neat diagram explain the CBEMA and ITI curve.
  - Explain Harmonic sources from Industrial loads.
  - With a neat diagram explain IEC flicker meter.

**Section – II**

- Q.4 Answer any four** **16**
- Explain Transient Stability Improvement.
  - Explain the hybrid phase angle regulator.
  - Explain the basic control of TCBR.
  - Explain the construction and working of TSC-TCR.
  - Explain the basic types of FACTS Controllers.
- Q.5 Answer any two** **12**
- Explain the working of SSSC with a diagram and waveforms.
  - Explain the UPFC back to back voltage source converter.
  - Differentiate between STATCOM and SVC.



**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Extra High Voltage AC Transmission**

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page .

Marks: 14

14

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Extra High Voltage AC Transmission**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- Explain the different mechanical considerations in EHV line performance.
- How the audible noise is generated and what are the characteristics?
- Explain attenuation of travelling waves on transmission line.
- Explain in detail advantages and disadvantages of high voltage.
- Derive equation for line energization with trapped charge voltage.
- Derive differential equations for general case in travelling waves.

**Q.3 Solve any two of the following questions. 12**

- A power of 11500 MW is required to be transmitted over a distance of 900 km. At voltage levels of 750 kV determine:
  - Possible no. of circuits required with equal magnitudes for sending and receiving, end voltages with 30° phase difference.
  - The total currents transmitted
  - The total line losses
 Assume the value of  $x = 0.272 \text{ ohm/km}$  and  $r = 0.0136 \text{ ohm/km}$  for 750 kV.
- Derive the expressions for reflection and refraction of travelling waves.
- Derive the expression  $P_c = \frac{1}{2} KC(V_m^2 - V_0^2)$  for the energy loss from charge voltage diagram.

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- Write a short note on ferro-resonance over voltages.
- Explain the methods for reduction of switching surge over voltages in EHV systems.
- Explain the term power circle diagram and its use.
- Explain sub-synchronous resonance problem and counter measures.
- Explain line insulation design based upon transient over voltages in detail.
- Explain the factors under steady state in design of EHV lines.

**Q.5 Solve any two of the following questions. 12**

- Derive the expression for single frequency lumped parameter circuit.
- Explain conductor-tower, conductor-ground and conductor-conductor clearances for EHV transmission line.
- Derive the expressions for generalized constants of transmission line.

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Extra High Voltage AC Transmission**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page .

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) On a lightly loaded transmission line
  - a) Receiving end voltage can exceed sending end voltage
  - b) Receiving end voltage can't exceed sending end voltage
  - c) Capacitive charging current is reduced
  - d) None of these
- 2) Charging current of a line is more at
 

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| a) Mid-point     | b) Sending end       |
| c) Receiving end | d) One-third of line |
- 3) Switching over-voltages are more hazardous than lightning surges in case of
 

|                        |                        |
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| a) Low voltage systems | b) 11 kV systems       |
| c) Unbalanced systems  | d) EHV and UHV systems |
- 4) The entire line performance can be determined by
  - a) Sending end power circle diagram
  - b) Receiving end power circle diagram
  - c) Universal power circle diagram
  - d) (a) or (c)
- 5) Which of the following statement is true?
  - a) Shunt reactors are used for power factors improvement
  - b) Shunt reactor are used to control the line voltage
  - c) Shunt reactors are used to reduce the line impedance
  - d) Shunt reactors are used to eliminate line to ground capacitance
- 6) Which among these is/are the fundamental economical principles that influence/s the design of transmission lines?
  - a) Economic choice of conductor size
  - b) Economic choice of transmission voltage
  - c) Both (a) and (b)
  - d) Economic choice of transmission line length
- 7) The power loss is important for the design of
 

|              |                      |
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| a) Generator | b) Motor             |
| c) Feeder    | d) Transmission line |

- 8) The function of steel wire in an ACSR conductor is to \_\_\_\_\_.  
a) Compensate for skin effect  
b) Take care of surges  
c) Provide additional mechanical strength  
d) Reduce inductance
- 9) The percentage power loss in 750 kV transmission line is nearly equal to \_\_\_\_\_.  
a) 3.27  
b) 4.76  
c) 0.78  
d) 2.5
- 10) Galloping in transmission line conductors arises due to \_\_\_\_\_.  
a) Asymmetrical layers of ice formation  
b) Vortex phenomenon in light winds  
c) Heavy weight of the line conductors  
d) Adoption of horizontal conductor configuration
- 11) Which type of corona discharge gives interference to radio broadcast  
a) Pulse type  
b) Pulse less type  
c) Glow corona  
d) None of the above
- 12) The effect of high voltage gradient on bundled conductors are evaluated all over the world by \_\_\_\_\_.  
a) Drums  
b) Solid cylinders  
c) Cages  
d) None of the above
- 13) Draining of trapped charge of line is done by  
a) Main breaker  
b) Auxiliary breaker  
c) Air circuit breaker  
d) Shunt reactors
- 14) The cause of reflected and refracted wave is  
a) Discontinuity at the junction  
b) Lighting effect  
c) Switching surge  
d) None of these

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Extra High Voltage AC Transmission**

Day & Date: Thursday, 16-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- Explain the different mechanical considerations in EHV line performance.
- How the audible noise is generated and what are the characteristics?
- Explain attenuation of travelling waves on transmission line.
- Explain in detail advantages and disadvantages of high voltage.
- Derive equation for line energization with trapped charge voltage.
- Derive differential equations for general case in travelling waves.

**Q.3 Solve any two of the following questions. 12**

- A power of 11500 MW is required to be transmitted over a distance of 900 km. At voltage levels of 750 kV determine:
  - Possible no. of circuits required with equal magnitudes for sending and receiving, end voltages with 30° phase difference.
  - The total currents transmitted
  - The total line losses
 Assume the value of  $x = 0.272 \text{ ohm/km}$  and  $r = 0.0136 \text{ ohm/km}$  for 750 kV.
- Derive the expressions for reflection and refraction of travelling waves.
- Derive the expression  $P_c = \frac{1}{2} KC(V_m^2 - V_0^2)$  for the energy loss from charge voltage diagram.

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- Write a short note on ferro-resonance over voltages.
- Explain the methods for reduction of switching surge over voltages in EHV systems.
- Explain the term power circle diagram and its use.
- Explain sub-synchronous resonance problem and counter measures.
- Explain line insulation design based upon transient over voltages in detail.
- Explain the factors under steady state in design of EHV lines.

**Q.5 Solve any two of the following questions. 12**

- Derive the expression for single frequency lumped parameter circuit.
- Explain conductor-tower, conductor-ground and conductor-conductor clearances for EHV transmission line.
- Derive the expressions for generalized constants of transmission line.

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Extra High Voltage AC Transmission**

Day & Date: Thursday, 16-02-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page .

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The entire line performance can be determined by
  - a) Sending end power circle diagram
  - b) Receiving end power circle diagram
  - c) Universal power circle diagram
  - d) (a) or (c)
- 2) Which of the following statement is true?
  - a) Shunt reactors are used for power factors improvement
  - b) Shunt reactor are used to control the line voltage
  - c) Shunt reactors are used to reduce the line impedance
  - d) Shunt reactors are used to eliminate line to ground capacitance
- 3) Which among these is/are the fundamental economical principles that influence/s the design of transmission lines?
  - a) Economic choice of conductor size
  - b) Economic choice of transmission voltage
  - c) Both (a) and (b)
  - d) Economic choice of transmission line length
- 4) The power loss is important for the design of
  - a) Generator
  - b) Motor
  - c) Feeder
  - d) Transmission line
- 5) The function of steel wire in an ACSR conductor is to \_\_\_\_\_.
  - a) Compensate for skin effect
  - b) Take care of surges
  - c) Provide additional mechanical strength
  - d) Reduce inductance
- 6) The percentage power loss in 750 kV transmission line is nearly equal to \_\_\_\_\_.
  - a) 3.27
  - b) 4.76
  - c) 0.78
  - d) 2.5
- 7) Galloping in transmission line conductors arises due to \_\_\_\_\_.
  - a) Asymmetrical layers of ice formation
  - b) Vortex phenomenon in light winds
  - c) Heavy weight of the line conductors
  - d) Adoption of horizontal conductor configuration





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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Extra High Voltage AC Transmission**

Day & Date: Thursday, 16-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- Explain the different mechanical considerations in EHV line performance.
- How the audible noise is generated and what are the characteristics?
- Explain attenuation of travelling waves on transmission line.
- Explain in detail advantages and disadvantages of high voltage.
- Derive equation for line energization with trapped charge voltage.
- Derive differential equations for general case in travelling waves.

**Q.3 Solve any two of the following questions. 12**

- A power of 11500 MW is required to be transmitted over a distance of 900 km. At voltage levels of 750 kV determine:
  - Possible no. of circuits required with equal magnitudes for sending and receiving, end voltages with 30° phase difference.
  - The total currents transmitted
  - The total line losses
 Assume the value of  $x = 0.272 \text{ ohm/km}$  and  $r = 0.0136 \text{ ohm/km}$  for 750 kV.
- Derive the expressions for reflection and refraction of travelling waves.
- Derive the expression  $P_c = \frac{1}{2} KC(V_m^2 - V_0^2)$  for the energy loss from charge voltage diagram.

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- Write a short note on ferro-resonance over voltages.
- Explain the methods for reduction of switching surge over voltages in EHV systems.
- Explain the term power circle diagram and its use.
- Explain sub-synchronous resonance problem and counter measures.
- Explain line insulation design based upon transient over voltages in detail.
- Explain the factors under steady state in design of EHV lines.

**Q.5 Solve any two of the following questions. 12**

- Derive the expression for single frequency lumped parameter circuit.
- Explain conductor-tower, conductor-ground and conductor-conductor clearances for EHV transmission line.
- Derive the expressions for generalized constants of transmission line.

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Extra High Voltage AC Transmission**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page No. 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page .

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Draining of trapped charge of line is done by
  - a) Main breaker
  - b) Auxiliary breaker
  - c) Air circuit breaker
  - d) Shunt reactors
- 2) The cause of reflected and refracted wave is
  - a) Discontinuity at the junction
  - b) Lighting effect
  - c) Switching surge
  - d) None of these
- 3) On a lightly loaded transmission line
  - a) Receiving end voltage can exceed sending end voltage
  - b) Receiving end voltage can't exceed sending end voltage
  - c) Capacitive charging current is reduced
  - d) None of these
- 4) Charging current of a line is more at
  - a) Mid-point
  - b) Sending end
  - c) Receiving end
  - d) One-third of line
- 5) Switching over-voltages are more hazardous than lightning surges in case of
  - a) Low voltage systems
  - b) 11 kV systems
  - c) Unbalanced systems
  - d) EHV and UHV systems
- 6) The entire line performance can be determined by
  - a) Sending end power circle diagram
  - b) Receiving end power circle diagram
  - c) Universal power circle diagram
  - d) (a) or (c)
- 7) Which of the following statement is true?
  - a) Shunt reactors are used for power factors improvement
  - b) Shunt reactor are used to control the line voltage
  - c) Shunt reactors are used to reduce the line impedance
  - d) Shunt reactors are used to eliminate line to ground capacitance

- 8) Which among these is/are the fundamental economical principles that influence/s the design of transmission lines?
  - a) Economic choice of conductor size
  - b) Economic choice of transmission voltage
  - c) Both (a) and (b)
  - d) Economic choice of transmission line length
- 9) The power loss is important for the design of
  - a) Generator
  - b) Motor
  - c) Feeder
  - d) Transmission line
- 10) The function of steel wire in an ACSR conductor is to \_\_\_\_\_.
  - a) Compensate for skin effect
  - b) Take care of surges
  - c) Provide additional mechanical strength
  - d) Reduce inductance
- 11) The percentage power loss in 750 kV transmission line is nearly equal to \_\_\_\_\_.
  - a) 3.27
  - b) 4.76
  - c) 0.78
  - d) 2.5
- 12) Galloping in transmission line conductors arises due to \_\_\_\_\_.
  - a) Asymmetrical layers of ice formation
  - b) Vortex phenomenon in light winds
  - c) Heavy weight of the line conductors
  - d) Adoption of horizontal conductor configuration
- 13) Which type of corona discharge gives interference to radio broadcast
  - a) Pulse type
  - b) Pulse less type
  - c) Glow corona
  - d) None of the above
- 14) The effect of high voltage gradient on bundled conductors are evaluated all over the world by \_\_\_\_\_.
  - a) Drums
  - b) Solid cylinders
  - c) Cages
  - d) None of the above

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**Fourth Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Extra High Voltage AC Transmission**

Day & Date: Thursday, 16-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Section I and Section II are compulsory  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following questions. 16**

- Explain the different mechanical considerations in EHV line performance.
- How the audible noise is generated and what are the characteristics?
- Explain attenuation of travelling waves on transmission line.
- Explain in detail advantages and disadvantages of high voltage.
- Derive equation for line energization with trapped charge voltage.
- Derive differential equations for general case in travelling waves.

**Q.3 Solve any two of the following questions. 12**

- A power of 11500 MW is required to be transmitted over a distance of 900 km. At voltage levels of 750 kV determine:
  - Possible no. of circuits required with equal magnitudes for sending and receiving, end voltages with 30° phase difference.
  - The total currents transmitted
  - The total line losses
 Assume the value of  $x = 0.272 \text{ ohm/km}$  and  $r = 0.0136 \text{ ohm/km}$  for 750 kV.
- Derive the expressions for reflection and refraction of travelling waves.
- Derive the expression  $P_c = \frac{1}{2} KC(V_m^2 - V_0^2)$  for the energy loss from charge voltage diagram.

**Section – II**

**Q.4 Solve any four of the following questions. 16**

- Write a short note on ferro-resonance over voltages.
- Explain the methods for reduction of switching surge over voltages in EHV systems.
- Explain the term power circle diagram and its use.
- Explain sub-synchronous resonance problem and counter measures.
- Explain line insulation design based upon transient over voltages in detail.
- Explain the factors under steady state in design of EHV lines.

**Q.5 Solve any two of the following questions. 12**

- Derive the expression for single frequency lumped parameter circuit.
- Explain conductor-tower, conductor-ground and conductor-conductor clearances for EHV transmission line.
- Derive the expressions for generalized constants of transmission line.

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Planning**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The load forecasting is method to predict \_\_\_\_\_.  
 a) Past loads  
 b) Present loads  
 c) Future loads  
 d) None of these
- 2) Factors affecting load forecasting are \_\_\_\_\_.  
 a) Weather condition  
 b) Time factors  
 c) Special events  
 d) All of these
- 3) In Load forecasting, The present and lead time is represented by \_\_\_\_\_.  
 a)  $\sigma, j$   
 b)  $\Pi, k$   
 c)  $X, l$   
 d) None of the above
- 4) Existing Distribution systems are \_\_\_\_\_.  
 a) Properly designed  
 b) Chaotic  
 c) Optimally operated  
 d) Automated
- 5) Distribution automation is used for \_\_\_\_\_.  
 a) Electrical quantities only  
 b) Physical quantities only  
 c) Both of the above  
 d) All of the above
- 6) Distribution automation (DA) is a family of technologies, including \_\_\_\_\_.  
 a) Sensors  
 b) Processors  
 c) Information and communication networks  
 d) All of above



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**Set****P**

**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Planning**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**Section – I**

**Q.2 Solve any Four.** **16**

- 1) Explain in details classification of load forecasting.
- 2) Explain with neat diagram A time-horizon perspective of power system studies.
- 3) What do you mean by Distribution Automation? Explain tools of distribution automation.
- 4) What is generation planning? What are factors affecting this?
- 5) Explain the objectives of generation planning.

**Q.3 Solve any Two.** **12**

- 1) Which are the different techniques for load forecasting?
- 2) What do you understand by system planning? Explain main aims of different types of system planning.
- 3) What is integrated resource planning? Explain in brief.

**Section – II**

**Q.4 Solve any Four.** **16**

- 1) What is Transmission planning?
- 2) Explain Energy Conservation and its importance.
- 3) What do you mean by Energy audit?
- 4) What do you mean by Demand side Management?
- 5) Explain New algorithms and methods relating to Load Forecasting.

**Q.5 Solve any Two.** **12**

- 1) Write short note on listing of energy conservation opportunities (ECOs).
- 2) Explain New algorithms and methods relating to power system planning.
- 3) Explain the Data required for Composite System Reliability and quality.

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Planning**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) For flour mills, power consumed is \_\_\_\_\_.
  - a) 10-15 KW
  - b) 100-200 W
  - c) 200 W
  - d) 7 kW
- 2) The capital cost of a power plant depends on \_\_\_\_\_.
  - a) Total installed capacity only
  - b) Total number of units only
  - c) Both (a) and (b)
  - d) None of these
- 3) What is the modern trend in electric power generation?
  - a) To have a large number of small size thermal plants located at different places.
  - b) To have a large Size thermal plants near load centre.
  - c) To have a large Size thermal plants located near coal fields.
  - d) None of the above.
- 4) Planning for power systems is essentially a projection of
  - a) How the system should grow over a specific period of time
  - b) Judgment about the future loads and the size of investment in generating capacity additions.
  - c) Transmission facilities expansion and reinforcements
  - d) All of above
- 5) Transmission efficiency of line increases with the
  - a) Decrease in power factor and voltage
  - b) Increase in power factor and voltage
  - c) Increase in power factor but Decrease in voltage
  - d) Increase in voltage but Decrease in power factor



- 6) What is the commercial unit of Energy?
- a) Electron volt
  - b) W/s
  - c) KWh
  - d) Joule
- 7) Energy conservation means
- a) Using Energy more efficiently
  - b) Reducing wastage of Energy
  - c) New investment in more efficient equipments
  - d) All of above
- 8) The load forecasting is method to predict\_\_\_\_\_.
- a) Past loads
  - b) Present loads
  - c) Future loads
  - d) None of these
- 9) Factors affecting load forecasting are\_\_\_\_\_.
- a) Weather condition
  - b) Time factors
  - c) Special events
  - d) All of these
- 10) In Load forecasting, The present and lead time is represented by \_\_\_\_\_.
- a)  $\sigma, j$
  - b)  $\Pi, k$
  - c)  $X, l$
  - d) None of the above
- 11) Existing Distribution systems are \_\_\_\_\_.
- a) Properly designed
  - b) Chaotic
  - c) Optimally operated
  - d) Automated
- 12) Distribution automation is used for \_\_\_\_\_.
- a) Electrical quantities only
  - b) Physical quantities only
  - c) Both of the above
  - d) All of the above
- 13) Distribution automation (DA) is a family of technologies, including \_\_\_\_\_.
- a) Sensors
  - b) Processors
  - c) Information and communication networks
  - d) All of above
- 14) For long term planning time period is \_\_\_\_\_.
- a) 0-2 years
  - b) 2-5 years
  - c) 5-10 years
  - d) All of above

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**Set Q**

**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Planning**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**Section – I**

**Q.2 Solve any Four.** **16**

- 1) Explain in details classification of load forecasting.
- 2) Explain with neat diagram A time-horizon perspective of power system studies.
- 3) What do you mean by Distribution Automation? Explain tools of distribution automation.
- 4) What is generation planning? What are factors affecting this?
- 5) Explain the objectives of generation planning.

**Q.3 Solve any Two.** **12**

- 1) Which are the different techniques for load forecasting?
- 2) What do you understand by system planning? Explain main aims of different types of system planning.
- 3) What is integrated resource planning? Explain in brief.

**Section – II**

**Q.4 Solve any Four.** **16**

- 1) What is Transmission planning?
- 2) Explain Energy Conservation and its importance.
- 3) What do you mean by Energy audit?
- 4) What do you mean by Demand side Management?
- 5) Explain New algorithms and methods relating to Load Forecasting.

**Q.5 Solve any Two.** **12**

- 1) Write short note on listing of energy conservation opportunities (ECOs).
- 2) Explain New algorithms and methods relating to power system planning.
- 3) Explain the Data required for Composite System Reliability and quality.

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Planning**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Planning for power systems is essentially a projection of
  - a) How the system should grow over a specific period of time
  - b) Judgment about the future loads and the size of investment in generating capacity additions.
  - c) Transmission facilities expansion and reinforcements
  - d) All of above
- 2) Transmission efficiency of line increases with the
  - a) Decrease in power factor and voltage
  - b) Increase in power factor and voltage
  - c) Increase in power factor but Decrease in voltage
  - d) Increase in voltage but Decrease in power factor
- 3) What is the commercial unit of Energy?
  - a) Electron volt
  - b) W/s
  - c) KWh
  - d) Joule
- 4) Energy conservation means
  - a) Using Energy more efficiently
  - b) Reducing wastage of Energy
  - c) New investment in more efficient equipments
  - d) All of above
- 5) The load forecasting is method to predict\_\_\_\_\_.
  - a) Past loads
  - b) Present loads
  - c) Future loads
  - d) None of these
- 6) Factors affecting load forecasting are\_\_\_\_\_.
  - a) Weather condition
  - b) Time factors
  - c) Special events
  - d) All of these

- 7) In Load forecasting, The present and lead time is represented by \_\_\_\_\_.  
a)  $\sigma, j$   
b)  $\Pi, k$   
c)  $X, l$   
d) None of the above
- 8) Existing Distribution systems are \_\_\_\_\_.  
a) Properly designed  
b) Chaotic  
c) Optimally operated  
d) Automated
- 9) Distribution automation is used for \_\_\_\_\_.  
a) Electrical quantities only  
b) Physical quantities only  
c) Both of the above  
d) All of the above
- 10) Distribution automation (DA) is a family of technologies, including \_\_\_\_\_.  
a) Sensors  
b) Processors  
c) Information and communication networks  
d) All of above
- 11) For long term planning time period is \_\_\_\_\_.  
a) 0-2 years  
b) 2-5 years  
c) 5-10 years  
d) All of above
- 12) For flour mills, power consumed is \_\_\_\_\_.  
a) 10-15 KW  
b) 100-200 W  
c) 200 W  
d) 7 kW
- 13) The capital cost of a power plant depends on \_\_\_\_\_.  
a) Total installed capacity only  
b) Total number of units only  
c) Both (a) and (b)  
d) None of these
- 14) What is the modern trend in electric power generation?  
a) To have a large number of small size thermal plants located at different places.  
b) To have a large Size thermal plants near load centre.  
c) To have a large Size thermal plants located near coal fields.  
d) None of the above.

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**Set R**

**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Planning**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**Section – I**

**Q.2 Solve any Four.** **16**

- 1) Explain in details classification of load forecasting.
- 2) Explain with neat diagram A time-horizon perspective of power system studies.
- 3) What do you mean by Distribution Automation? Explain tools of distribution automation.
- 4) What is generation planning? What are factors affecting this?
- 5) Explain the objectives of generation planning.

**Q.3 Solve any Two.** **12**

- 1) Which are the different techniques for load forecasting?
- 2) What do you understand by system planning? Explain main aims of different types of system planning.
- 3) What is integrated resource planning? Explain in brief.

**Section – II**

**Q.4 Solve any Four.** **16**

- 1) What is Transmission planning?
- 2) Explain Energy Conservation and its importance.
- 3) What do you mean by Energy audit?
- 4) What do you mean by Demand side Management?
- 5) Explain New algorithms and methods relating to Load Forecasting.

**Q.5 Solve any Two.** **12**

- 1) Write short note on listing of energy conservation opportunities (ECOs).
- 2) Explain New algorithms and methods relating to power system planning.
- 3) Explain the Data required for Composite System Reliability and quality.

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Planning**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options. 14**

- 1) Distribution automation (DA) is a family of technologies, including \_\_\_\_\_.
  - a) Sensors
  - b) Processors
  - c) Information and communication networks
  - d) All of above
- 2) For long term planning time period is \_\_\_\_\_.
  - a) 0-2 years
  - b) 2-5 years
  - c) 5-10 years
  - d) All of above
- 3) For flour mills, power consumed is \_\_\_\_\_.
  - a) 10-15 KW
  - b) 100-200 W
  - c) 200 W
  - d) 7 kW
- 4) The capital cost of a power plant depends on \_\_\_\_\_.
  - a) Total installed capacity only
  - b) Total number of units only
  - c) Both (a) and (b)
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- 5) What is the modern trend in electric power generation?
  - a) To have a large number of small size thermal plants located at different places.
  - b) To have a large Size thermal plants near load centre.
  - c) To have a large Size thermal plants located near coal fields.
  - d) None of the above.
- 6) Planning for power systems is essentially a projection of
  - a) How the system should grow over a specific period of time
  - b) Judgment about the future loads and the size of investment in generating capacity additions.
  - c) Transmission facilities expansion and reinforcements
  - d) All of above

- 7) Transmission efficiency of line increases with the
- Decrease in power factor and voltage
  - Increase in power factor and voltage
  - Increase in power factor but Decrease in voltage
  - Increase in voltage but Decrease in power factor
- 8) What is the commercial unit of Energy?
- Electron volt
  - W/s
  - KWh
  - Joule
- 9) Energy conservation means
- Using Energy more efficiently
  - Reducing wastage of Energy
  - New investment in more efficient equipments
  - All of above
- 10) The load forecasting is method to predict\_\_\_\_\_.
- Past loads
  - Present loads
  - Future loads
  - None of these
- 11) Factors affecting load forecasting are\_\_\_\_\_.
- Weather condition
  - Time factors
  - Special events
  - All of these
- 12) In Load forecasting, The present and lead time is represented by \_\_\_\_\_.
- $\sigma, j$
  - $\Pi, k$
  - $X, l$
  - None of the above
- 13) Existing Distribution systems are \_\_\_\_\_.
- Properly designed
  - Chaotic
  - Optimally operated
  - Automated
- 14) Distribution automation is used for \_\_\_\_\_.
- Electrical quantities only
  - Physical quantities only
  - Both of the above
  - All of the above

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**Set S**

**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Planning**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks

**Section – I**

**Q.2 Solve any Four.** **16**

- 1) Explain in details classification of load forecasting.
- 2) Explain with neat diagram A time-horizon perspective of power system studies.
- 3) What do you mean by Distribution Automation? Explain tools of distribution automation.
- 4) What is generation planning? What are factors affecting this?
- 5) Explain the objectives of generation planning.

**Q.3 Solve any Two.** **12**

- 1) Which are the different techniques for load forecasting?
- 2) What do you understand by system planning? Explain main aims of different types of system planning.
- 3) What is integrated resource planning? Explain in brief.

**Section – II**

**Q.4 Solve any Four.** **16**

- 1) What is Transmission planning?
- 2) Explain Energy Conservation and its importance.
- 3) What do you mean by Energy audit?
- 4) What do you mean by Demand side Management?
- 5) Explain New algorithms and methods relating to Load Forecasting.

**Q.5 Solve any Two.** **12**

- 1) Write short note on listing of energy conservation opportunities (ECOs).
- 2) Explain New algorithms and methods relating to power system planning.
- 3) Explain the Data required for Composite System Reliability and quality.



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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Grid Technology**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) In which of the following methods, the data and power both are transferred with the same conductor?
  - a) Fibre optic communications
  - b) Cognitive radio
  - c) Power line communication
  - d) Cellular communication systems
- 2) According to IRIG B, Time synchronization accuracy requirement is upto \_\_\_\_\_.
 

|                |              |
|----------------|--------------|
| a) 0.5 $\mu$ s | b) 1 $\mu$ s |
| c) 2 $\mu$ s   | d) $\mu$ s   |
- 3) The boundaries of the customer domain typically consider which type of meters \_\_\_\_\_.
 

|                           |                              |
|---------------------------|------------------------------|
| a) Energy Services Load   | b) Energy Services Interface |
| c) Energy Services Demand | d) Wattmeter                 |
- 4) Service Provider communicates with which domain?
 

|                    |                 |
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| a) Bulk generation | b) Distribution |
| c) Transmission    | d) Customer     |
- 5) The transmission network is typically operated by \_\_\_\_\_.
  - a) Load Dispatch Centers
  - b) Distribution Company
  - c) Regional Load Dispatch Center
  - d) Generation Company
- 6) Energy Services Interface (ESI) communicates with other domain via: \_\_\_\_\_.
 

|                                   |                      |
|-----------------------------------|----------------------|
| a) AML infrastructure or Internet | b) Home Area Network |
| c) Local Area Network             | d) None of the above |
- 7) In the following which standard represent the Practice for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks.
 

|                         |                         |
|-------------------------|-------------------------|
| a) IEEE Standard 1547.3 | b) IEEE Standard 1547.4 |
| c) IEEE Standard 1547.5 | d) IEEE Standard 1547.6 |



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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Grid Technology**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR.** **16**

- a) What is the need of Smart Grid? What will be the components of Smart Grid?
- b) What are the different opportunities and Barriers of Smart Grid in India?
- c) What are smart energy meters? Explain its function in smart grid.
- d) Explain phase measurement unit and its importance in smart grid.
- e) Explain phase measurement unit and its importance in smart grid.

**Q.3 Solve any TWO.** **12**

- a) Explain how automatic meter reading can make the system Smarter?
- b) Explain the concept of Resilient and Self-Healing Grid.
- c) Explain EMC and its importance in smart grid.

**Section – II**

**Q.4 Solve any FOUR.** **16**

- a) Describe the concept, power quality conditioners related to smart grid.
- b) Explain the concept of Power Quality and EMC in Smart Grid.
- c) Explain how the reliability of smart grid can be enhanced by integrating IED into it.
- d) Describe web Based Power Quality Monitoring.
- e) Write short note on Cyber Controlled Smart Grid.

**Q.5 Solve any TWO.** **12**

- a) What is Broadband over power line? Explain working and feature of broadband over power Line.
- b) Write a note on, "Real Time Pricing".
- c) Explain role of AMI in Smart Grid.

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Grid Technology**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is the role of Gateway in smart grid architecture of IoT?
  - a) Store data
  - b) Manage data
  - c) Collect data
  - d) Security
- 2) What is the role of Cloud in smart grid architecture of IoT?
  - a) Store data
  - b) Manage data
  - c) Collect data
  - d) Security
- 3) Which protocol is used to link all the devices in the IoT?
  - a) TCP/IP
  - b) Network
  - c) UDP
  - d) HTTP
- 4) The process by which the faulty of the system gets isolated from healthy part is called \_\_\_\_\_.
  - a) Islanding
  - b) Earthing
  - c) Isolating
  - d) Detecting
- 5) Self-Healing can be done using \_\_\_\_\_.
  - a) Damping unwanted power oscillations.
  - b) Avoiding flow of the unwanted current from the grid.
  - c) Rerouting power flow in order to avoid overloading in transmission line.
  - d) All of the above
- 6) The Main difference between Conventional Grid & Smart Grid.
  - a) Unidirectional Flow of Power
  - b) Unidirectional and bidirectional flow of power and information respectively.
  - c) Bidirectional flow of information.
  - d) Bidirectional & Unidirectional flow of power.
- 7) Functions of Smart Grid is \_\_\_\_\_.
  - a) Technology maturity and risk in implementation
  - b) Efficiency and reliability of power system
  - c) Lack of awareness for consumers
  - d) None of these

- 8) In which of the following methods, the data and power both are transferred with the same conductor?
- a) Fibre optic communications
  - b) Cognitive radio
  - c) Power line communication
  - d) Cellular communication systems
- 9) According to IRIG B, Time synchronization accuracy requirement is upto \_\_\_\_.
- a) 0.5  $\mu$ s
  - b) 1  $\mu$ s
  - c) 2  $\mu$ s
  - d)  $\mu$ s
- 10) The boundaries of the customer domain typically consider which type of meters \_\_\_\_.
- a) Energy Services Load
  - b) Energy Services Interface
  - c) Energy Services Demand
  - d) Wattmeter
- 11) Service Provider communicates with which domain?
- a) Bulk generation
  - b) Distribution
  - c) Transmission
  - d) Customer
- 12) The transmission network is typically operated by \_\_\_\_.
- a) Load Dispatch Centers
  - b) Distribution Company
  - c) Regional Load Dispatch Center
  - d) Generation Company
- 13) Energy Services Interface (ESI) communicates with other domain via: \_\_\_\_.
- a) AMI infrastructure or Internet
  - b) Home Area Network
  - c) Local Area Network
  - d) None of the above
- 14) In the following which standard represent the Practice for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks.
- a) IEEE Standard 1547.3
  - b) IEEE Standard 1547.4
  - c) IEEE Standard 1547.5
  - d) IEEE Standard 1547.6

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Grid Technology**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR.** **16**

- a) What is the need of Smart Grid? What will be the components of Smart Grid?
- b) What are the different opportunities and Barriers of Smart Grid in India?
- c) What are smart energy meters? Explain its function in smart grid.
- d) Explain phase measurement unit and its importance in smart grid.
- e) Explain phase measurement unit and its importance in smart grid.

**Q.3 Solve any TWO.** **12**

- a) Explain how automatic meter reading can make the system Smarter?
- b) Explain the concept of Resilient and Self-Healing Grid.
- c) Explain EMC and its importance in smart grid.

**Section – II**

**Q.4 Solve any FOUR.** **16**

- a) Describe the concept, power quality conditioners related to smart grid.
- b) Explain the concept of Power Quality and EMC in Smart Grid.
- c) Explain how the reliability of smart grid can be enhanced by integrating IED into it.
- d) Describe web Based Power Quality Monitoring.
- e) Write short note on Cyber Controlled Smart Grid.

**Q.5 Solve any TWO.** **12**

- a) What is Broadband over power line? Explain working and feature of broadband over power Line.
- b) Write a note on, "Real Time Pricing".
- c) Explain role of AMI in Smart Grid.

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- 7) The boundaries of the customer domain typically consider which type of meters \_\_\_\_\_.  
a) Energy Services Load                      b) Energy Services Interface  
c) Energy Services Demand                  d) Wattmeter
- 8) Service Provider communicates with which domain?  
a) Bulk generation                              b) Distribution  
c) Transmission                                 d) Customer
- 9) The transmission network is typically operated by \_\_\_\_\_.  
a) Load Dispatch Centers  
b) Distribution Company  
c) Regional Load Dispatch Center  
d) Generation Company
- 10) Energy Services Interface (ESI) communicates with other domain via: \_\_\_\_.  
a) AML infrastructure or Internet              b) Home Area Network  
c) Local Area Network                          d) None of the above
- 11) In the following which standard represent the Practice for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks.  
a) IEEE Standard 1547.3                      b) IEEE Standard 1547.4  
c) IEEE Standard 1547.5                      d) IEEE Standard 1547.6
- 12) What is the role of Gateway in smart grid architecture of IoT?  
a) Store data                                      b) Manage data  
c) Collect data                                    d) Security
- 13) What is the role of Cloud in smart grid architecture of IoT?  
a) Store data                                      b) Manage data  
c) Collect data                                    d) Security
- 14) Which protocol is used to link all the devices in the IoT?  
a) TCP/IP                                          b) Network  
c) UDP                                              d) HTTP



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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Grid Technology**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR. 16**

- a) What is the need of Smart Grid? What will be the components of Smart Grid?
- b) What are the different opportunities and Barriers of Smart Grid in India?
- c) What are smart energy meters? Explain its function in smart grid.
- d) Explain phase measurement unit and its importance in smart grid.
- e) Explain phase measurement unit and its importance in smart grid.

**Q.3 Solve any TWO. 12**

- a) Explain how automatic meter reading can make the system Smarter?
- b) Explain the concept of Resilient and Self-Healing Grid.
- c) Explain EMC and its importance in smart grid.

**Section – II**

**Q.4 Solve any FOUR. 16**

- a) Describe the concept, power quality conditioners related to smart grid.
- b) Explain the concept of Power Quality and EMC in Smart Grid.
- c) Explain how the reliability of smart grid can be enhanced by integrating IED into it.
- d) Describe web Based Power Quality Monitoring.
- e) Write short note on Cyber Controlled Smart Grid.

**Q.5 Solve any TWO. 12**

- a) What is Broadband over power line? Explain working and feature of broadband over power Line.
- b) Write a note on, "Real Time Pricing".
- c) Explain role of AMI in Smart Grid.

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Grid Technology**

Day & Date: Monday, 20-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Energy Services Interface (ESI) communicates with other domain via: \_\_\_\_.  
 a) AML infrastructure or Internet      b) Home Area Network  
 c) Local Area Network                      d) None of the above
- 2) In the following which standard represent the Practice for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks.  
 a) IEEE Standard 1547.3                      b) IEEE Standard 1547.4  
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- 3) What is the role of Gateway in smart grid architecture of IoT?  
 a) Store data                                      b) Manage data  
 c) Collect data                                    d) Security
- 4) What is the role of Cloud in smart grid architecture of IoT?  
 a) Store data                                      b) Manage data  
 c) Collect data                                    d) Security
- 5) Which protocol is used to link all the devices in the IoT?  
 a) TCP/IP                                          b) Network  
 c) UDP                                              d) HTTP
- 6) The process by which the faulty of the system gets isolated from healthy part is called \_\_\_\_\_.  
 a) Islanding                                      b) Earthing  
 c) Isolating                                        d) Detecting
- 7) Self-Healing can be done using \_\_\_\_\_.  
 a) Damping unwanted power oscillations.  
 b) Avoiding flow of the unwanted current from the grid.  
 c) Rerouting power flow in order to avoid overloading in transmission line.  
 d) All of the above

- 8) The Main difference between Conventional Grid & Smart Grid.
- a) Unidirectional Flow of Power
  - b) Unidirectional and bidirectional flow of power and information respectively.
  - c) Bidirectional flow of information.
  - d) Bidirectional & Unidirectional flow of power.
- 9) Functions of Smart Grid is \_\_\_\_.
- a) Technology maturity and risk in implementation
  - b) Efficiency and reliability of power system
  - c) Lack of awareness for consumers
  - d) None of these
- 10) In which of the following methods, the data and power both are transferred with the same conductor?
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- 11) According to IRIG B, Time synchronization accuracy requirement is upto \_\_\_\_.
- a) 0.5  $\mu$ s
  - b) 1  $\mu$ s
  - c) 2  $\mu$ s
  - d)  $\mu$ s
- 12) The boundaries of the customer domain typically consider which type of meters \_\_\_\_.
- a) Energy Services Load
  - b) Energy Services Interface
  - c) Energy Services Demand
  - d) Wattmeter
- 13) Service Provider communicates with which domain?
- a) Bulk generation
  - b) Distribution
  - c) Transmission
  - d) Customer
- 14) The transmission network is typically operated by \_\_\_\_.
- a) Load Dispatch Centers
  - b) Distribution Company
  - c) Regional Load Dispatch Center
  - d) Generation Company

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Grid Technology**

Day & Date: Monday, 20-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any FOUR.** **16**

- a) What is the need of Smart Grid? What will be the components of Smart Grid?
- b) What are the different opportunities and Barriers of Smart Grid in India?
- c) What are smart energy meters? Explain its function in smart grid.
- d) Explain phase measurement unit and its importance in smart grid.
- e) Explain phase measurement unit and its importance in smart grid.

**Q.3 Solve any TWO.** **12**

- a) Explain how automatic meter reading can make the system Smarter?
- b) Explain the concept of Resilient and Self-Healing Grid.
- c) Explain EMC and its importance in smart grid.

**Section – II**

**Q.4 Solve any FOUR.** **16**

- a) Describe the concept, power quality conditioners related to smart grid.
- b) Explain the concept of Power Quality and EMC in Smart Grid.
- c) Explain how the reliability of smart grid can be enhanced by integrating IED into it.
- d) Describe web Based Power Quality Monitoring.
- e) Write short note on Cyber Controlled Smart Grid.

**Q.5 Solve any TWO.** **12**

- a) What is Broadband over power line? Explain working and feature of broadband over power Line.
- b) Write a note on, "Real Time Pricing".
- c) Explain role of AMI in Smart Grid.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Estimation and Installation**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 5:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Which among these tests are to be conducted on wiring installations?
  - a) Testing of polarity of non linked single pole switches
  - b) Testing of earth continuity path
  - c) Testing of earth resistance
  - d) All of these
- 2) Which lamp is used in the outdoor illumination of buildings and airport runway?
  - a) Halogen lamp
  - b) Gaseous discharge lamp
  - c) Sodium vapour lamp
  - d) All of these
- 3) How is the ballast resistance connected with the choke?
  - a) Parallel
  - b) Series
  - c) Can be connected in either way
  - d) Both (a) & (b)
- 4) What is the normal life of a fluorescent lamp?
  - a) 2000 hours
  - b) 3500 hours
  - c) 7500 hours
  - d) 10000 hours
- 5) How many earth connections are required for the motor frame as per the IE rule 61?
  - a) One
  - b) Two separate and distinct
  - c) Three separate and distinct
  - d) All of these
- 6) What should be the spacing between the two conductors if the working voltage is 11 kV?
  - a) 76 mm
  - b) 101 mm
  - c) 190 mm
  - d) 250 mm
- 7) What should be the minimum clearance for laying power cables near communication lines?
  - a) 0.2 m horizontally and vertically
  - b) 0.6 m horizontally and vertically
  - c) 1 m horizontally and vertically
  - d) 1.5 m horizontally and vertically



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**Set****P**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Estimation and Installation**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- a) When working on live conductors, what personal apparel should be kept in mind?
- b) What are the objectives of testing?
- c) What do you mean by direct and indirect testing?
- d) Explain in brief the procedure for rescuing the person who has received an electric shock.
- e) Explain High voltage test, commutation test for d.c. machine.

**Q.3 Answer the following (Any Two) 12**

- a) What are different types of fire extinguishers used to extinguish fire due to electrical reasons? Explain their mode of operation in brief.
- b) Plan the preventive maintenance schedule for storage batteries used in the relay room of the receiving station.
- c) A 33 KV substation is to be Connected to a 11 KV stepdown substation which is at a distance of 1.5 km by a underground cable. If the size of the transformer in the stepdown substation is 500 KVA, determine the size of the cable

**Section – II**

**Q.4 Answer the following (Any Four) 16**

- a) What are the effects of mis-alignment?
- b) Explain the factors involved in designing the machine foundation.
- c) List the properties of transformer oil
- d) What are the protections provided by RCCB?
- e) Explain High voltage test, commutation test for d.c. machine.

**Q.5 Answer the following (Any Two) 12**

- a) Draw a neat diagram of Sumpner's test and explain how this can be used for finding the efficiency of transformers under test.
- b) What care should be taken to protect electrical equipment during the period of inactivity?
- c) What is ELCB? How it operates? State its application.

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- 9)** Which lamp is used in the outdoor illumination of buildings and airport runway?
- a) Halogen lamp
  - b) Gaseous discharge lamp
  - c) Sodium vapour lamp
  - d) All of these
- 10)** How is the ballast resistance connected with the choke?
- a) Parallel
  - b) Series
  - c) Can be connected in either way
  - d) Both (a) & (b)
- 11)** What is the normal life of a fluorescent lamp?
- a) 2000 hours
  - b) 3500 hours
  - c) 7500 hours
  - d) 10000 hours
- 12)** How many earth connections are required for the motor frame as per the IE rule 61?
- a) One
  - b) Two separate and distinct
  - c) Three separate and distinct
  - d) All of these
- 13)** What should be the spacing between the two conductors if the working voltage is 11 kV?
- a) 76 mm
  - b) 101 mm
  - c) 190 mm
  - d) 250 mm
- 14)** What should be the minimum clearance for laying power cables near communication lines?
- a) 0.2 m horizontally and vertically
  - b) 0.6 m horizontally and vertically
  - c) 1 m horizontally and vertically
  - d) 1.5 m horizontally and vertically

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Estimation and Installation**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- a) When working on live conductors, what personal apparel should be kept in mind?
- b) What are the objectives of testing?
- c) What do you mean by direct and indirect testing?
- d) Explain in brief the procedure for rescuing the person who has received an electric shock.
- e) Explain High voltage test, commutation test for d.c. machine.

**Q.3 Answer the following (Any Two) 12**

- a) What are different types of fire extinguishers used to extinguish fire due to electrical reasons? Explain their mode of operation in brief.
- b) Plan the preventive maintenance schedule for storage batteries used in the relay room of the receiving station.
- c) A 33 KV substation is to be Connected to a 11 KV stepdown substation which is at a distance of 1.5 km by a underground cable. If the size of the transformer in the stepdown substation is 500 KVA, determine the size of the cable

**Section – II**

**Q.4 Answer the following (Any Four) 16**

- a) What are the effects of mis-alignment?
- b) Explain the factors involved in designing the machine foundation.
- c) List the properties of transformer oil
- d) What are the protections provided by RCCB?
- e) Explain High voltage test, commutation test for d.c. machine.

**Q.5 Answer the following (Any Two) 12**

- a) Draw a neat diagram of Sumpner's test and explain how this can be used for finding the efficiency of transformers under test.
- b) What care should be taken to protect electrical equipment during the period of inactivity?
- c) What is ELCB? How it operates? State its application.

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**Set R****Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022****ELECTRICAL ENGINEERING****Electrical Estimation and Installation**

Day &amp; Date: Wednesday, 22-02-2023

Max. Marks: 70

Time: 02:00 PM To 5:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.****14**

- 1) As per I.E.C. for 132 kv system voltage, the impulse withstand voltage is
  - a) 250kv
  - b) 350kv
  - c) 450kv
  - d) 550kv
- 2) Out of different methods available for testing of d.c. motors, Swinburne's test and Hopkinson's test are commonly used in practice on
  - a) Shunt generators
  - b) Series motors
  - c) Shunt motors
  - d) All of these
- 3) Swinburne's test and brake tests \_\_\_\_\_
  - a) Both are direct method of testing
  - b) Direct method of testing, indirect method of testing
  - c) Indirect method of testing, direct method of testing
  - d) Both are indirect method of testing
- 4) Swinburne's test can be performed at \_\_\_\_\_
  - a) Any load
  - b) Only no load
  - c) Only full load
  - d) Only half load
- 5) Which among these tests are to be conducted on wiring installations?
  - a) Testing of polarity of non linked single pole switches
  - b) Testing of earth continuity path
  - c) Testing of earth resistance
  - d) All of these
- 6) Which lamp is used in the outdoor illumination of buildings and airport runway?
  - a) Halogen lamp
  - b) Gaseous discharge lamp
  - c) Sodium vapour lamp
  - d) All of these
- 7) How is the ballast resistance connected with the choke?
  - a) Parallel
  - b) Series
  - c) Can be connected in either way
  - d) Both (a) & (b)

- Page 8 of 12

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| <b>Seat No.</b> |  |
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**Set R**

**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Estimation and Installation**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- a) When working on live conductors, what personal apparel should be kept in mind?
- b) What are the objectives of testing?
- c) What do you mean by direct and indirect testing?
- d) Explain in brief the procedure for rescuing the person who has received an electric shock.
- e) Explain High voltage test, commutation test for d.c. machine.

**Q.3 Answer the following (Any Two) 12**

- a) What are different types of fire extinguishers used to extinguish fire due to electrical reasons? Explain their mode of operation in brief.
- b) Plan the preventive maintenance schedule for storage batteries used in the relay room of the receiving station.
- c) A 33 KV substation is to be Connected to a 11 KV stepdown substation which is at a distance of 1.5 km by a underground cable. If the size of the transformer in the stepdown substation is 500 KVA, determine the size of the cable

**Section – II**

**Q.4 Answer the following (Any Four) 16**

- a) What are the effects of mis-alignment?
- b) Explain the factors involved in designing the machine foundation.
- c) List the properties of transformer oil
- d) What are the protections provided by RCCB?
- e) Explain High voltage test, commutation test for d.c. machine.

**Q.5 Answer the following (Any Two) 12**

- a) Draw a neat diagram of Sumpner's test and explain how this can be used for finding the efficiency of transformers under test.
- b) What care should be taken to protect electrical equipment during the period of inactivity?
- c) What is ELCB? How it operates? State its application.

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**Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Electrical Estimation and Installation**

Day & Date: Wednesday, 22-02-2023

Max. Marks: 70

Time: 02:00 PM To 5:00 PM

- Instructions:**
- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
  - 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
  - 3) Figures to the right indicates full marks
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What should be the spacing between the two conductors if the working voltage is 11 kV?
 

|           |           |
|-----------|-----------|
| a) 76 mm  | b) 101 mm |
| c) 190 mm | d) 250 mm |
- 2) What should be the minimum clearance for laying power cables near communication lines?
 

|                                      |
|--------------------------------------|
| a) 0.2 m horizontally and vertically |
| b) 0.6 m horizontally and vertically |
| c) 1 m horizontally and vertically   |
| d) 1.5 m horizontally and vertically |
- 3) What is the multiplication factor used for the determination of maximum current carrying capacity of an 11kV line?
 

|         |         |
|---------|---------|
| a) 0.88 | b) 0.95 |
| c) 0.9  | d) 0.8  |
- 4) Which type of cable is used for underground service connections?
 

|                               |                               |
|-------------------------------|-------------------------------|
| a) Low tension 3 ¼ core cable | b) Low tension 3 ½ core cable |
| c) Low tension 2 ¼ core cable | d) Low tension 2 ½ core cable |
- 5) What should be the height of the 'Roof Pole'?
 

|                 |                  |
|-----------------|------------------|
| a) Less than 5m | b) Less than 3m  |
| c) More than 3m | d) More than 10m |
- 6) As per I.E.C. for 132 kv system voltage, the impulse withstand voltage is
 

|          |          |
|----------|----------|
| a) 250kv | b) 350kv |
| c) 450kv | d) 550kv |
- 7) Out of different methods available for testing of d.c. motors, Swinburne's test and Hopkinson's test are commonly used in practice on
 

|                     |                  |
|---------------------|------------------|
| a) Shunt generators | b) Series motors |
| c) Shunt motors     | d) All of these  |

- 8) Swinburne's test and brake tests \_\_\_\_\_
- a) Both are direct method of testing
  - b) Direct method of testing, indirect method of testing
  - c) Indirect method of testing, direct method of testing
  - d) Both are indirect method of testing
- 9) Swinburne's test can be performed at \_\_\_\_\_
- a) Any load
  - b) Only no load
  - c) Only full load
  - d) Only half load
- 10) Which among these tests are to be conducted on wiring installations?
- a) Testing of polarity of non linked single pole switches
  - b) Testing of earth continuity path
  - c) Testing of earth resistance
  - d) All of these
- 11) Which lamp is used in the outdoor illumination of buildings and airport runway?
- a) Halogen lamp
  - b) Gaseous discharge lamp
  - c) Sodium vapour lamp
  - d) All of these
- 12) How is the ballast resistance connected with the choke?
- a) Parallel
  - b) Series
  - c) Can be connected in either way
  - d) Both (a) & (b)
- 13) What is the normal life of a fluorescent lamp?
- a) 2000 hours
  - b) 3500 hours
  - c) 7500 hours
  - d) 10000 hours
- 14) How many earth connections are required for the motor frame as per the IE rule 61?
- a) One
  - b) Two separate and distinct
  - c) Three separate and distinct
  - d) All of these

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**Set S****Fourth Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022****ELECTRICAL ENGINEERING****Electrical Estimation and Installation**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 5:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following (Any Four) 16**

- a) When working on live conductors, what personal apparel should be kept in mind?
- b) What are the objectives of testing?
- c) What do you mean by direct and indirect testing?
- d) Explain in brief the procedure for rescuing the person who has received an electric shock.
- e) Explain High voltage test, commutation test for d.c. machine.

**Q.3 Answer the following (Any Two) 12**

- a) What are different types of fire extinguishers used to extinguish fire due to electrical reasons? Explain their mode of operation in brief.
- b) Plan the preventive maintenance schedule for storage batteries used in the relay room of the receiving station.
- c) A 33 KV substation is to be Connected to a 11 KV stepdown substation which is at a distance of 1.5 km by a underground cable. If the size of the transformer in the stepdown substation is 500 KVA, determine the size of the cable

**Section – II**

**Q.4 Answer the following (Any Four) 16**

- a) What are the effects of mis-alignment?
- b) Explain the factors involved in designing the machine foundation.
- c) List the properties of transformer oil
- d) What are the protections provided by RCCB?
- e) Explain High voltage test, commutation test for d.c. machine.

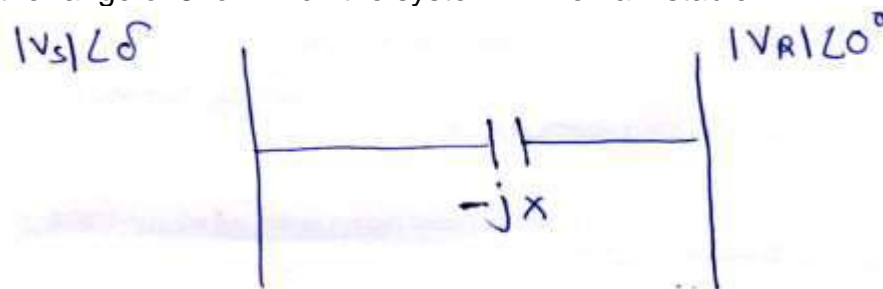
**Q.5 Answer the following (Any Two) 12**

- a) Draw a neat diagram of Sumpner's test and explain how this can be used for finding the efficiency of transformers under test.
- b) What care should be taken to protect electrical equipment during the period of inactivity?
- c) What is ELCB? How it operates? State its application.



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- 7) The angle  $\delta$  in the swing equation of a synchronous generator is the \_\_\_\_\_.  
 a) angle between stator voltage and current  
 b) angular displacement of the rotor with respect to the stator  
 c) angular displacement of the stator mmf with respect to a synchronously rotating axis  
 d) angular displacement of an axis fixed to the rotor with respect to a synchronously rotating axis
- 8) A 100 MVA, 11 kV, 3 phase, 50 Hz, 8 pole synchronous generator has an inertia constant  $H = 4$  seconds. The stored energy in the rotor of the generator at synchronous speed will be \_\_\_\_\_.  
 a) 100 MJ  
 b) 400 MJ  
 c) 800 MJ  
 d) 12.5 MJ
- 9) Which colored wire are ground wires that protect appliances from electrical fires?  
 a) Red-Purple  
 b) Black-Green  
 c) Blue-Black  
 d) Green-Yellow
- 10) A 40 MVA, 11 KV, 3-phase, 50 Hz, 4-pole turbo alternator has an inertia constant of 15 sec. An input of 20 MW developed 15 MW of output power. Then the acceleration is \_\_\_\_\_.  
 a)  $60^\circ/s^2$   
 b)  $70^\circ/s^2$   
 c)  $75^\circ/s^2$   
 d) None of these
- 11) Steady state power limit is \_\_\_\_\_.  
 a)  $P = EV/X$   
 b)  $P = EV/X \sin(\delta)$   
 c)  $P = EV/X \cos(\delta)$   
 d)  $P = EV/X \sin 30$
- 12) With the use of high-speed circuit breakers, which among the following stability is increased?  
 a) Steady-state stability  
 b) Transient stability  
 c) Frequency stability  
 d) All of the above
- 13) Two buses are connected with the reactance shown in the figure. Find the range of  $\delta$  for which the system will remain stable.



- a)  $0^\circ$  to  $90^\circ$   
 b)  $-90^\circ$  to  $0^\circ$   
 c)  $-90^\circ$  to  $90^\circ$   
 d)  $90^\circ$  to  $180^\circ$
- 14) A 3-phase overhead line has a reactance of 0.5 pu. The sending end voltage is  $1\angle\delta^\circ$ . In order to maintain the receiving end voltage equal to the sending end voltage, a synchronous phase modifier is installed. Determine the rating of the modifier (MVAR) when the load at the receiving end is 0.75 pu at 0.8 pf lagging. Take 100 MVA as the base \_\_\_\_\_.  
 a) 70.7 MVAR  
 b) 70 MVAR  
 c) 77 MVAR  
 d) 0.7 MVAR

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Dynamics and stability**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instruction:** All questions are compulsory.

**Section – I**

**Q.2 Answer any four questions. 16**

- a) State and explain angular and load stability of power system.
- b) Explain significance of first swing stability of generators. Draw Power-angle curve and explain Equal Area Criterion.
- c) Explain about the different subsystems of a power system and associated controls and operating states of power system.
- d) Explain about the modelling of Synchronous machine using park's transformation.
- e) Draw the functional and standard block diagram of excitation system and explain.

**Q.3 Answer any two questions. 12**

- a) Draw and explain generator capability curve label the diagram indicating various limitations on generation of active and reactive power, and stability limits.
- b) Explain dynamic modeling of synchronous motors using d-q axis transformation.
- c) What is necessity of steady state stability and how this is evaluated?

**Section – II**

**Q.4 Answer any two questions. 16**

- a) Explain about the small signal stability of system by eigen value approach.
- b) Draw the block diagram and Explain about the small signal stability for SMIB system with RH criterion.
- c) Explain about the Power system stabilizer with each component in PSS.
- d) Explain about the concepts of multi machine stability.
- e) What are different solution techniques for transient stability and explain the modified Euler method for the determination of transient stability.

**Q.5 Answer any two questions. 12**

- a) Write short notes on:
  - 1) Methods to counteract the sub synchronous oscillations.
  - 2) Voltage stability using Bifurcation theory
- b) What are problems caused by self excitation and how these can be overcome using filters and damping devices.
- c) Explain how resonance can occur in power system. What are its effects on power system apparatus?


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## Max. Marks: 70

Marks: 14

14

- $|V_s| \angle \delta$ 

 $|V_A| \angle 0^\circ$

- a)  $0^\circ$  to  $90^\circ$   
b)  $-90^\circ$  to  $0^\circ$   
c)  $-90^\circ$  to  $90^\circ$   
d)  $90^\circ$  to  $180^\circ$



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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Dynamics and stability**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instruction:** All questions are compulsory.

**Section – I**

**Q.2 Answer any four questions. 16**

- State and explain angular and load stability of power system.
- Explain significance of first swing stability of generators. Draw Power-angle curve and explain Equal Area Criterion.
- Explain about the different subsystems of a power system and associated controls and operating states of power system.
- Explain about the modelling of Synchronous machine using park's transformation.
- Draw the functional and standard block diagram of excitation system and explain.

**Q.3 Answer any two questions. 12**

- Draw and explain generator capability curve label the diagram indicating various limitations on generation of active and reactive power, and stability limits.
- Explain dynamic modeling of synchronous motors using d-q axis transformation.
- What is necessity of steady state stability and how this is evaluated?

**Section – II**

**Q.4 Answer any two questions. 16**

- Explain about the small signal stability of system by eigen value approach.
- Draw the block diagram and Explain about the small signal stability for SMIB system with RH criterion.
- Explain about the Power system stabilizer with each component in PSS.
- Explain about the concepts of multi machine stability.
- What are different solution techniques for transient stability and explain the modified Euler method for the determination of transient stability.

**Q.5 Answer any two questions. 12**

- Write short notes on:
  - Methods to counteract the sub synchronous oscillations.
  - Voltage stability using Bifurcation theory
- What are problems caused by self excitation and how these can be overcome using filters and damping devices.
- Explain how resonance can occur in power system. What are its effects on power system apparatus?



- 6) The synchronizing power is \_\_\_\_\_ when two alternators are running in synchronism.
- negative
  - positive
  - zero
  - Cannot be determined
- 7) Equal area criteria and Swing equation are used for \_\_\_\_\_ and \_\_\_\_\_ Stability respectively.
- Steady state, Transient
  - Transient, Steady state
  - Both are used for steady state stability
  - Both are used for transient stability
- 8) When only X is present, The steady-state stability limit for the transmission line will be \_\_\_\_\_.
- greater than  $V_1V_2/X$
  - less than  $V_1V_2/X$
  - equal to  $V_1V_2/X$
  - equal to  $V_1V_2/Z$
- 9) The power transfer capability of a transmission line is the most affected by \_\_\_\_\_.
- Shunt conductance
  - Capacitance
  - Resistance
  - Inductance
- 10) Stability of a system is not affected by \_\_\_\_\_.
- Reactance of line
  - Losses
  - Reactance of generator
  - Excitation of generator
- 11) The angle  $\delta$  in the swing equation of a synchronous generator is the \_\_\_\_\_.
- angle between stator voltage and current
  - angular displacement of the rotor with respect to the stator
  - angular displacement of the stator mmf with respect to a synchronously rotating axis
  - angular displacement of an axis fixed to the rotor with respect to a synchronously rotating axis
- 12) A 100 MVA, 11 kV, 3 phase, 50 Hz, 8 pole synchronous generator has an inertia constant  $H = 4$  seconds. The stored energy in the rotor of the generator at synchronous speed will be \_\_\_\_\_.
- 100 MJ
  - 400 MJ
  - 800 MJ
  - 12.5 MJ
- 13) Which colored wire are ground wires that protect appliances from electrical fires?
- Red-Purple
  - Black-Green
  - Blue-Black
  - Green-Yellow
- 14) A 40 MVA, 11 KV, 3-phase, 50 Hz, 4-pole turbo alternator has an inertia constant of 15 sec. An input of 20 MW developed 15 MW of output power. Then the acceleration is \_\_\_\_\_.
- $60^\circ/s^2$
  - $70^\circ/s^2$
  - $75^\circ/s^2$
  - None of these



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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Power System Dynamics and stability**

Day & Date: Wednesday, 22-02-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instruction:** All questions are compulsory.

**Section – I**

**Q.2 Answer any four questions. 16**

- State and explain angular and load stability of power system.
- Explain significance of first swing stability of generators. Draw Power-angle curve and explain Equal Area Criterion.
- Explain about the different subsystems of a power system and associated controls and operating states of power system.
- Explain about the modelling of Synchronous machine using park's transformation.
- Draw the functional and standard block diagram of excitation system and explain.

**Q.3 Answer any two questions. 12**

- Draw and explain generator capability curve label the diagram indicating various limitations on generation of active and reactive power, and stability limits.
- Explain dynamic modeling of synchronous motors using d-q axis transformation.
- What is necessity of steady state stability and how this is evaluated?

**Section – II**

**Q.4 Answer any two questions. 16**

- Explain about the small signal stability of system by eigen value approach.
- Draw the block diagram and Explain about the small signal stability for SMIB system with RH criterion.
- Explain about the Power system stabilizer with each component in PSS.
- Explain about the concepts of multi machine stability.
- What are different solution techniques for transient stability and explain the modified Euler method for the determination of transient stability.

**Q.5 Answer any two questions. 12**

- Write short notes on:
  - Methods to counteract the sub synchronous oscillations.
  - Voltage stability using Bifurcation theory
- What are problems caused by self excitation and how these can be overcome using filters and damping devices.
- Explain how resonance can occur in power system. What are its effects on power system apparatus?

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Dynamics and stability**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

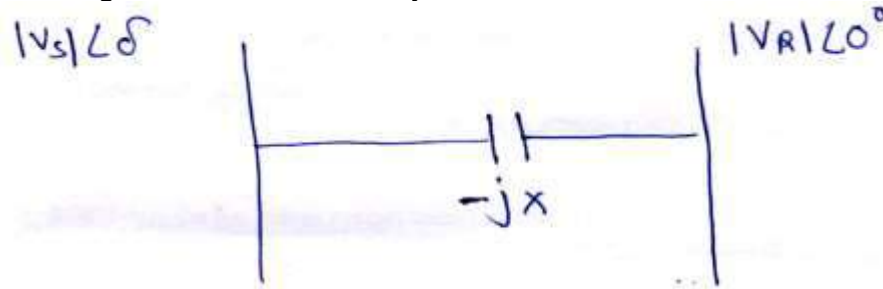
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Stability of a system is not affected by \_\_\_\_\_.  
 a) Reactance of line                      b) Losses  
 c) Reactance of generator              d) Excitation of generator
- 2) The angle  $\delta$  in the swing equation of a synchronous generator is the \_\_\_\_\_.  
 a) angle between stator voltage and current  
 b) angular displacement of the rotor with respect to the stator  
 c) angular displacement of the stator mmf with respect to a synchronously rotating axis  
 d) angular displacement of an axis fixed to the rotor with respect to a synchronously rotating axis
- 3) A 100 MVA, 11 kV, 3 phase, 50 Hz, 8 pole synchronous generator has an inertia constant  $H = 4$  seconds. The stored energy in the rotor of the generator at synchronous speed will be \_\_\_\_\_.  
 a) 100 MJ                                      b) 400 MJ  
 c) 800 MJ                                      d) 12.5 MJ
- 4) Which colored wire are ground wires that protect appliances from electrical fires?  
 a) Red-Purple                                  b) Black-Green  
 c) Blue-Black                                  d) Green-Yellow
- 5) A 40 MVA, 11 KV, 3-phase, 50 Hz, 4-pole turbo alternator has an inertia constant of 15 sec. An input of 20 MW developed 15 MW of output power. Then the acceleration is \_\_\_\_\_.  
 a)  $60^\circ/s^2$                                       b)  $70^\circ/s^2$   
 c)  $75^\circ/s^2$                                       d) None of these
- 6) Steady state power limit is \_\_\_\_\_.  
 a)  $P = EV/X$                                       b)  $P = EV/X \sin(\delta)$   
 c)  $P = EV/X \cos(\delta)$                           d)  $P = EV/X \sin 30$
- 7) With the use of high-speed circuit breakers, which among the following stability is increased?  
 a) Steady-state stability                      b) Transient stability  
 c) Frequency stability                          d) All of the above

- 8) Two buses are connected with the reactance shown in the figure. Find the range of  $\delta$  for which the system will remain stable.



- a)  $0^\circ$  to  $90^\circ$                       b)  $-90^\circ$  to  $0^\circ$   
 c)  $-90^\circ$  to  $90^\circ$                       d)  $90^\circ$  to  $180^\circ$
- 9) A 3-phase overhead line has a reactance of 0.5 pu. The sending end voltage is  $1 \angle \delta^\circ$ . In order to maintain the receiving end voltage equal to the sending end voltage, a synchronous phase modifier is installed. Determine the rating of the modifier (MVAR) when the load at the receiving end is 0.75 pu at 0.8 pf lagging. Take 100 MVA as the base \_\_\_\_.
- a) 70.7 MVAR                      b) 70 MVAR  
 c) 77 MVAR                      d) 0.7 MVAR
- 10) Transient state stability is generally improved by \_\_\_\_.
- a) Using high speed governors on the machines  
 b) Using low inertia machines  
 c) Dispensing with neutral grounding  
 d) Any of the above
- 11) The synchronizing power is \_\_\_\_ when two alternators are running in synchronism.
- a) negative                      b) positive  
 c) zero                      d) Cannot be determined
- 12) Equal area criteria and Swing equation are used for \_\_\_\_ and \_\_\_\_ Stability respectively.
- a) Steady state, Transient  
 b) Transient, Steady state  
 c) Both are used for steady state stability  
 d) Both are used for transient stability
- 13) When only X is present, The steady-state stability limit for the transmission line will be \_\_\_\_.
- a) greater than  $V_1 V_2 / X$                       b) less than  $V_1 V_2 / X$   
 c) equal to  $V_1 V_2 / X$                       d) equal to  $V_1 V_2 / Z$
- 14) The power transfer capability of a transmission line is the most affected by \_\_\_\_.
- a) Shunt conductance                      b) Capacitance  
 c) Resistance                      d) Inductance

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**Fourth Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System Dynamics and stability**

Day & Date: Wednesday, 22-02-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instruction:** All questions are compulsory.

**Section – I**

**Q.2 Answer any four questions. 16**

- State and explain angular and load stability of power system.
- Explain significance of first swing stability of generators. Draw Power-angle curve and explain Equal Area Criterion.
- Explain about the different subsystems of a power system and associated controls and operating states of power system.
- Explain about the modelling of Synchronous machine using park's transformation.
- Draw the functional and standard block diagram of excitation system and explain.

**Q.3 Answer any two questions. 12**

- Draw and explain generator capability curve label the diagram indicating various limitations on generation of active and reactive power, and stability limits.
- Explain dynamic modeling of synchronous motors using d-q axis transformation.
- What is necessity of steady state stability and how this is evaluated?

**Section – II**

**Q.4 Answer any two questions. 16**

- Explain about the small signal stability of system by eigen value approach.
- Draw the block diagram and Explain about the small signal stability for SMIB system with RH criterion.
- Explain about the Power system stabilizer with each component in PSS.
- Explain about the concepts of multi machine stability.
- What are different solution techniques for transient stability and explain the modified Euler method for the determination of transient stability.

**Q.5 Answer any two questions. 12**

- Write short notes on:
  - Methods to counteract the sub synchronous oscillations.
  - Voltage stability using Bifurcation theory
- What are problems caused by self excitation and how these can be overcome using filters and damping devices.
- Explain how resonance can occur in power system. What are its effects on power system apparatus?

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Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.
- 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data if necessary.

## Marks: 14

14

- Page 1 of 12

- 9) A typical organization is devoted to the principle of \_\_\_\_\_.  
a) bureaucracy                      b) efficiency  
c) information                        d) knowledge
- 10) A typical business undergoes which of below pressure \_\_\_\_\_.  
a) legal                                  b) political  
c) technological                        d) all of these
- 11) Key member leaving project team is an example of \_\_\_\_\_.  
a) internal risk                        b) forecast  
c) Issue                                  d) all of these
- 12) A working model that is functionally equivalent to a component of the product is called \_\_\_\_\_.  
a) spiral model                         b) v model  
c) waterfall model                      d) none of these
- 13) Two types of database query are \_\_\_\_\_ and \_\_\_\_\_.  
a) select, update                        b) action, select  
c) action, update                        d) action, retrieval
- 14) Which of below is a sources of data into an enterprise?  
a) Clicksteram at web site              b) CRM input  
c) supply chain input                    d) all of these

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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two.** **12**

- a) Classify information systems based on its levels.
- b) With suitable diagram explain flow of e payment with credit/debit card.
- c) With suitable example evaluate need, challenges and benefits of ECM.

**Q.3 Solve Any Four.** **16**

- a) Compare OLAP and data mining.
- b) What are the different models of web mining?
- c) With suitable example explain data, database, information and knowledge.
- d) Describe any four models of e business.
- e) With suitable example compare forward and reverse auctions.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) With suitable example describe any six attributes of the software project.
- b) With suitable example explain how ERP interfaces with other enterprise systems.
- c) With suitable diagram and example explain various flows and processes in supply chain management.

**Q.5 Solve Any Four.** **16**

- a) With suitable example discuss any two ethical issues related to information systems.
- b) With suitable example explain - copyright and patent.
- c) Justify with example - a software project requires a good project management.
- d) Evaluate importance and different types of milestones.
- e) Justify - information systems and organization influence each other.

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- 9) Collection of computing systems used by organization in information system is referred as- \_\_\_\_\_.  
a) e infrastructure                      b) information technology  
c) Processes                              d) all of these
- 10) Which of below is not a major economical impact of information system on organization \_\_\_\_\_.  
a) shrink in organization size              b) change in workplace  
c) reduction in transaction cost          d) outsourcing of services
- 11) Which of below is a legal issue with e commerce \_\_\_\_\_.  
a) admissible evidence                      b) digital signature  
c) Jurisdiction                              d) all of these
- 12) Software is a \_\_\_\_\_ product.  
a) Complex                                      b) intangible  
c) non conform                              d) all of these
- 13) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.  
a) Information technology                  b) Cloud computing  
c) Web services                              d) Apps
- 14) A business analyst is an example of \_\_\_\_\_.  
a) data worker                                  b) information worker  
c) knowledge worker                      d) manager

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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two.** **12**

- a) Classify information systems based on its levels.
- b) With suitable diagram explain flow of e payment with credit/debit card.
- c) With suitable example evaluate need, challenges and benefits of ECM.

**Q.3 Solve Any Four.** **16**

- a) Compare OLAP and data mining.
- b) What are the different models of web mining?
- c) With suitable example explain data, database, information and knowledge.
- d) Describe any four models of e business.
- e) With suitable example compare forward and reverse auctions.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) With suitable example describe any six attributes of the software project.
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Day & Date: Tuesday, 07-02-2023  
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## Marks: 14

## 14

- 1) Key member leaving project team is an example of \_\_\_\_\_.  
a) internal risk                      b) forecast  
c) Issue                                d) all of these
- 2) A working model that is functionally equivalent to a component of the product is called \_\_\_\_\_.  
a) spiral model                      b) v model  
c) waterfall model                  d) none of these
- 3) Two types of database query are \_\_\_\_\_ and \_\_\_\_\_.  
a) select, update                    b) action, select  
c) action, update                   d) action, retrieval
- 4) Which of below is a sources of data into an enterprise?  
a) Clicksteram at web site              b) CRM input  
c) supply chain input                  d) all of these
- 5) Take odd man out- MS Project, MS Access, DB2, Oracle \_\_\_\_\_.  
a) MS Project                         b) MS Access  
c) DB2                                  d) Oracle
- 6) Collection of computing systems used by organization in information system is referred as- \_\_\_\_\_.  
a) e infrastructure                      b) information technology  
c) Processes                            d) all of these
- 7) Which of below is not a major economical impact of information system on organization \_\_\_\_\_.  
a) shrink in organization size              b) change in workplace  
c) reduction in transaction cost          d) outsourcing of services
- 8) Which of below is a legal issue with e commerce \_\_\_\_\_.  
a) admissible evidence                  b) digital signature  
c) Jurisdiction                         d) all of these

- 9) Software is a \_\_\_\_\_ product.
- a) Complex
  - b) intangible
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- 10) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.
- a) Information technology
  - b) Cloud computing
  - c) Web services
  - d) Apps
- 11) A business analyst is an example of \_\_\_\_\_.
- a) data worker
  - b) information worker
  - c) knowledge worker
  - d) manager
- 12) Take an odd man out- NEFT, IRCTC, RTGS, PayTM, \_\_\_\_\_.
- a) NEFT
  - b) IRCTC
  - c) RTGS
  - d) PayTM
- 13) A typical organization is devoted to the principle of \_\_\_\_\_.
- a) bureaucracy
  - b) efficiency
  - c) information
  - d) knowledge
- 14) A typical business undergoes which of below pressure \_\_\_\_\_.
- a) legal
  - b) political
  - c) technological
  - d) all of these

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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Information Technology and Management**

Day &amp; Date: Tuesday, 07-02-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two.** **12**

- a) Classify information systems based on its levels.
- b) With suitable diagram explain flow of e payment with credit/debit card.
- c) With suitable example evaluate need, challenges and benefits of ECM.

**Q.3 Solve Any Four.** **16**

- a) Compare OLAP and data mining.
- b) What are the different models of web mining?
- c) With suitable example explain data, database, information and knowledge.
- d) Describe any four models of e business.
- e) With suitable example compare forward and reverse auctions.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) With suitable example describe any six attributes of the software project.
- b) With suitable example explain how ERP interfaces with other enterprise systems.
- c) With suitable diagram and example explain various flows and processes in supply chain management.

**Q.5 Solve Any Four.** **16**

- a) With suitable example discuss any two ethical issues related to information systems.
- b) With suitable example explain - copyright and patent.
- c) Justify with example - a software project requires a good project management.
- d) Evaluate importance and different types of milestones.
- e) Justify - information systems and organization influence each other.

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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each questions carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.
 

|                           |                    |
|---------------------------|--------------------|
| a) Information technology | b) Cloud computing |
| c) Web services           | d) Apps            |
- 2) A business analyst is an example of \_\_\_\_\_.
 

|                     |                       |
|---------------------|-----------------------|
| a) data worker      | b) information worker |
| c) knowledge worker | d) manager            |
- 3) Take an odd man out- NEFT, IRCTC, RTGS, PayTM, \_\_\_\_\_.
 

|         |          |
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| a) NEFT | b) IRCTC |
| c) RTGS | d) PayTM |
- 4) A typical organization is devoted to the principle of \_\_\_\_\_.
 

|                |               |
|----------------|---------------|
| a) bureaucracy | b) efficiency |
| c) information | d) knowledge  |
- 5) A typical business undergoes which of below pressure \_\_\_\_\_.
 

|                  |                 |
|------------------|-----------------|
| a) legal         | b) political    |
| c) technological | d) all of these |
- 6) Key member leaving project team is an example of \_\_\_\_\_.
 

|                  |                 |
|------------------|-----------------|
| a) internal risk | b) forecast     |
| c) Issue         | d) all of these |
- 7) A working model that is functionally equivalent to a component of the product is called \_\_\_\_\_.
 

|                    |                  |
|--------------------|------------------|
| a) spiral model    | b) v model       |
| c) waterfall model | d) none of these |
- 8) Two types of database query are \_\_\_\_\_ and \_\_\_\_\_.
 

|                   |                      |
|-------------------|----------------------|
| a) select, update | b) action, select    |
| c) action, update | d) action, retrieval |

- 9) Which of below is a sources of data into an enterprise?  
a) Clicksteram at web site                      b) CRM input  
c) supply chain input                              d) all of these
- 10) Take odd man out- MS Project, MS Access, DB2, Oracle \_\_\_\_\_.  
a) MS Project                                              b) MS Access  
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- 11) Collection of computing systems used by organization in information system is referred as- \_\_\_\_\_.  
a) e infrastructure                                      b) information technology  
c) Processes                                              d) all of these
- 12) Which of below is not a major economical impact of information system on organization \_\_\_\_\_.  
a) shrink in organization size                      b) change in workplace  
c) reduction in transaction cost                      d) outsourcing of services
- 13) Which of below is a legal issue with e commerce \_\_\_\_\_.  
a) admissible evidence                              b) digital signature  
c) Jurisdiction                                              d) all of these
- 14) Software is a \_\_\_\_\_ product.  
a) Complex                                              b) intangible  
c) non conform                                              d) all of these

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**T.Y. (B.Tech.) (Sem- I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Information Technology and Management**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.

**Section – I**

**Q.2 Solve Any Two.** **12**

- a) Classify information systems based on its levels.
- b) With suitable diagram explain flow of e payment with credit/debit card.
- c) With suitable example evaluate need, challenges and benefits of ECM.

**Q.3 Solve Any Four.** **16**

- a) Compare OLAP and data mining.
- b) What are the different models of web mining?
- c) With suitable example explain data, database, information and knowledge.
- d) Describe any four models of e business.
- e) With suitable example compare forward and reverse auctions.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) With suitable example describe any six attributes of the software project.
- b) With suitable example explain how ERP interfaces with other enterprise systems.
- c) With suitable diagram and example explain various flows and processes in supply chain management.

**Q.5 Solve Any Four.** **16**

- a) With suitable example discuss any two ethical issues related to information systems.
- b) With suitable example explain - copyright and patent.
- c) Justify with example - a software project requires a good project management.
- d) Evaluate importance and different types of milestones.
- e) Justify - information systems and organization influence each other.



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Set **P**

**T.Y. (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ is the study of business situation activities and decisions where issues of rights and wrong are addressed
 

|                       |                        |
|-----------------------|------------------------|
| a) Business Decisions | b) Business Situations |
| c) Business Theories  | d) Business Ethics     |
- 2) Some businessman do \_\_\_\_\_ by indulging in unfair trade practices like black-marketing, artificial high pricing, cheating in weight and measures, selling of duplicate and harmful products etc.
 

|                          |                        |
|--------------------------|------------------------|
| a) Business Decisions    | b) Business Situations |
| c) Business Malpractices | d) Business Ethics     |
- 3) In \_\_\_\_\_ the degree to which one is autonomous and driven primarily to act for the benefit of ones self, contrasted with a more social orientation that emphasize group working and community goals.
 

|                               |                       |
|-------------------------------|-----------------------|
| a) Individualism/Collectivism | b) Power Distance     |
| c) Uncertainty Avoidance      | d) Masculine Approach |
- 4) \_\_\_\_\_ is managing any area of business, whether it is production, marketing accounting, human resources or any other functions constitute a whole range of activities covering formal and informal means of planning, implementing and control.
 

|                        |                               |
|------------------------|-------------------------------|
| a) Business Decisions  | b) Business Ethics            |
| c) Business Situations | d) Business Ethics Management |
- 5) \_\_\_\_\_ commit organisation, industries or professionals to specific beliefs, values and actions that set our appropriate ethical behaviour for employees.
 

|                        |                    |
|------------------------|--------------------|
| a) Code of ethics      | b) Code of conduct |
| c) Business Situations | c) Business Ethics |
- 6) What is Full Form Of CSR?
 

|                                    |                              |
|------------------------------------|------------------------------|
| a) Corporate Social Reporting      | b) Corporate Social Research |
| c) Corporate Social Responsibility | d) None of these             |

- 7) Which responsibility makes corporations to do what is right and fair even when they are not compelled to do so by the legal framework?
- a) Ethical Responsibility
  - b) Legal Responsibility
  - c) Philanthropic Responsibility
  - d) Economic Responsibility
- 8) \_\_\_\_\_ in the business context occurs when employees receive preferential treatment on grounds that are not directly related to their qualifications and performance in the job.
- a) Right and Duties
  - b) Discrimination
  - c) Employees Privacy
  - d) Due process and layoffs
- 9) \_\_\_\_\_ is just one aspect of marketing communications.
- a) Advertisement
  - b) Product Policy
  - c) Marketing Management
  - d) None of these
- 10) CSO stands for what?
- a) Civil society organization
  - b) Consumer Society organization
  - c) Central Statistics office
  - d) None of these
- 11) \_\_\_\_\_ is an attempt by one or more parties to achieve certain objectives by urging individual consumers to refrain from making selected purchases in the marketplace.
- a) Boycott
  - b) Demonstration and marches
  - c) Protests
  - d) Occupations
- 12) Government is stakeholder of organization.
- a) True
  - b) False
- 13) \_\_\_\_\_ is the long- term maintenance of the system according to environmental and economical and Social consideration.
- a) Security
  - b) Sustainability
  - c) Business Ethics
  - d) None of above
- 14) Functions of Civil Society are \_\_\_\_\_.
- a) Protection
  - b) Monitoring
  - c) Social Cohesion
  - d) All of above

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**T.Y. (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Define Business ethics & explain its importance.
- b) Define globalization & explain issues in globalization.
- c) Explain the stages in ethical decision making.
- d) Explain concept of corporate citizenship & its 3 perspective.
- e) Explain the components of business ethics management.

**Q.3 Solve any two of the following.** **12**

- a) Elaborate Individual and situational influences on decision making.
- b) Explain 4 port model of CSR
- c) Explain normative ethical theories.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) What are implications of globalization for business relations with government?
- b) Define environmental ethics & environmental responsibilities.
- c) Explain the functions of CSO.
- d) Explain the ethical issues in firm-employee relationship.
- e) Explain IT code of conduct.

**Q.5 Solve any two of the following.** **12**

- a) Explain how government act as a stakeholder of a business.
- b) Define CSO & explain the ethical issues in CSO.
- c) Define stakeholders & explain who are stakeholders of any business.

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**T.Y. (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ in the business context occurs when employees receive preferential treatment on grounds that are not directly related to their qualifications and performance in the job.
 

|                      |                            |
|----------------------|----------------------------|
| a) Right and Duties  | b) Discrimination          |
| c) Employees Privacy | d) Due process and layoffs |
- 2) \_\_\_\_\_ is just one aspect of marketing communications.
 

|                         |                   |
|-------------------------|-------------------|
| a) Advertisement        | b) Product Policy |
| c) Marketing Management | d) None of these  |
- 3) CSO stands for what?
 

|                               |                                  |
|-------------------------------|----------------------------------|
| a) Civil society organization | b) Consumer Society organization |
| c) Central Statistics office  | d) None of these                 |
- 4) \_\_\_\_\_ is an attempt by one or more parties to achieve certain objectives by urging individual consumers to refrain from making selected purchases in the marketplace.
 

|             |                              |
|-------------|------------------------------|
| a) Boycott  | b) Demonstration and marches |
| c) Protests | d) Occupations               |
- 5) Government is stakeholder of organization.
 

|         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|
- 6) \_\_\_\_\_ is the long- term maintenance of the system according to environmental and economical and Social consideration.
 

|                    |                   |
|--------------------|-------------------|
| a) Security        | b) Sustainability |
| c) Business Ethics | d) None of above  |
- 7) Functions of Civil Society are \_\_\_\_\_.
 

|                    |                 |
|--------------------|-----------------|
| a) Protection      | b) Monitoring   |
| c) Social Cohesion | d) All of above |

- 8) \_\_\_\_\_ is the study of business situation activities and decisions where issues of rights and wrong are addressed
- a) Business Decisions                      b) Business Situations  
c) Business Theories                      d) Business Ethics
- 9) Some businessman do \_\_\_\_\_ by indulging in unfair trade practices like black-marketing, artificial high pricing, cheating in weight and measures, selling of duplicate and harmful products etc.
- a) Business Decisions                      b) Business Situations  
c) Business Malpractices                      d) Business Ethics
- 10) In \_\_\_\_\_ the degree to which one is autonomous and driven primarily to act for the benefit of ones self, contrasted with a more social orientation that emphasize group working and community goals.
- a) Individualism/Collectivism                      b) Power Distance  
c) Uncertainty Avoidance                      d) Masculine Approach
- 11) \_\_\_\_\_ is managing any area of business, whether it is production, marketing accounting, human resources or any other functions constitute a whole range of activities covering formal and informal means of planning, implementing and control.
- a) Business Decisions                      b) Business Ethics  
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- 12) \_\_\_\_\_ commit organisation, industries or professionals to specific beliefs, values and actions that set our appropriate ethical behaviour for employees.
- a) Code of ethics                      b) Code of conduct  
c) Business Situations                      c) Business Ethics
- 13) What is Full Form Of CSR?
- a) Corporate Social Reporting                      b) Corporate Social Research  
c) Corporate Social Responsibility                      d) None of these
- 14) Which responsibility makes corporations to do what is right and fair even when they are not compelled to do so by the legal framework?
- a) Ethical Responsibility  
b) Legal Responsibility  
c) Philanthropic Responsibility  
d) Economic Responsibility

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**Set Q**

**T.Y. (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Define Business ethics & explain its importance.
- b) Define globalization & explain issues in globalization.
- c) Explain the stages in ethical decision making.
- d) Explain concept of corporate citizenship & its 3 perspective.
- e) Explain the components of business ethics management.

**Q.3 Solve any two of the following.** **12**

- a) Elaborate Individual and situational influences on decision making.
- b) Explain 4 port model of CSR
- c) Explain normative ethical theories.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) What are implications of globalization for business relations with government?
- b) Define environmental ethics & environmental responsibilities.
- c) Explain the functions of CSO.
- d) Explain the ethical issues in firm-employee relationship.
- e) Explain IT code of conduct.

**Q.5 Solve any two of the following.** **12**

- a) Explain how government act as a stakeholder of a business.
- b) Define CSO & explain the ethical issues in CSO.
- c) Define stakeholders & explain who are stakeholders of any business.

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**T.Y. (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ is an attempt by one or more parties to achieve certain objectives by urging individual consumers to refrain from making selected purchases in the marketplace.
 

|             |                              |
|-------------|------------------------------|
| a) Boycott  | b) Demonstration and marches |
| c) Protests | d) Occupations               |
- 2) Government is stakeholder of organization.
 

|         |          |
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| a) True | b) False |
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- 3) \_\_\_\_\_ is the long- term maintenance of the system according to environmental and economical and Social consideration.
 

|                    |                   |
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| a) Security        | b) Sustainability |
| c) Business Ethics | d) None of above  |
- 4) Functions of Civil Society are \_\_\_\_\_.
 

|                    |                 |
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| a) Protection      | b) Monitoring   |
| c) Social Cohesion | d) All of above |
- 5) \_\_\_\_\_ is the study of business situation activities and decisions where issues of rights and wrong are addressed
 

|                       |                        |
|-----------------------|------------------------|
| a) Business Decisions | b) Business Situations |
| c) Business Theories  | d) Business Ethics     |
- 6) Some businessman do \_\_\_\_\_ by indulging in unfair trade practices like black-marketing, artificial high pricing, cheating in weight and measures, selling of duplicate and harmful products etc.
 

|                          |                        |
|--------------------------|------------------------|
| a) Business Decisions    | b) Business Situations |
| c) Business Malpractices | d) Business Ethics     |
- 7) In \_\_\_\_\_ the degree to which one is autonomous and driven primarily to act for the benefit of ones self, contrasted with a more social orientation that emphasize group working and community goals.
 

|                               |                       |
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| a) Individualism/Collectivism | b) Power Distance     |
| c) Uncertainty Avoidance      | d) Masculine Approach |

- 8) \_\_\_\_\_ is managing any area of business, whether it is production, marketing accounting, human resources or any other functions constitute a whole range of activities covering formal and informal means of planning, implementing and control.
- a) Business Decisions                      b) Business Ethics  
c) Business Situations                      d) Business Ethics Management
- 9) \_\_\_\_\_ commit organisation, industries or professionals to specific beliefs, values and actions that set our appropriate ethical behaviour for employees.
- a) Code of ethics                              b) Code of conduct  
c) Business Situations                      d) Business Ethics
- 10) What is Full Form Of CSR?
- a) Corporate Social Reporting              b) Corporate Social Research  
c) Corporate Social Responsibility        d) None of these
- 11) Which responsibility makes corporations to do what is right and fair even when they are not compelled to do so by the legal framework?
- a) Ethical Responsibility  
b) Legal Responsibility  
c) Philanthropic Responsibility  
d) Economic Responsibility
- 12) \_\_\_\_\_ in the business context occurs when employees receive preferential treatment on grounds that are not directly related to their qualifications and performance in the job.
- a) Right and Duties                          b) Discrimination  
c) Employees Privacy                      d) Due process and layoffs
- 13) \_\_\_\_\_ is just one aspect of marketing communications.
- a) Advertisement                            b) Product Policy  
c) Marketing Management                d) None of these
- 14) CSO stands for what?
- a) Civil society organization  
b) Consumer Society organization  
c) Central Statistics office  
d) None of these



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**Set R**

**T.Y. (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Define Business ethics & explain its importance.
- b) Define globalization & explain issues in globalization.
- c) Explain the stages in ethical decision making.
- d) Explain concept of corporate citizenship & its 3 perspective.
- e) Explain the components of business ethics management.

**Q.3 Solve any two of the following.** **12**

- a) Elaborate Individual and situational influences on decision making.
- b) Explain 4 port model of CSR
- c) Explain normative ethical theories.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) What are implications of globalization for business relations with government?
- b) Define environmental ethics & environmental responsibilities.
- c) Explain the functions of CSO.
- d) Explain the ethical issues in firm-employee relationship.
- e) Explain IT code of conduct.

**Q.5 Solve any two of the following.** **12**

- a) Explain how government act as a stakeholder of a business.
- b) Define CSO & explain the ethical issues in CSO.
- c) Define stakeholders & explain who are stakeholders of any business.

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**T.Y. (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks:14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) What is Full Form Of CSR?
 

|                                    |                              |
|------------------------------------|------------------------------|
| a) Corporate Social Reporting      | b) Corporate Social Research |
| c) Corporate Social Responsibility | d) None of these             |
- 2) Which responsibility makes corporations to do what is right and fair even when they are not compelled to do so by the legal framework?
 

|                                 |
|---------------------------------|
| a) Ethical Responsibility       |
| b) Legal Responsibility         |
| c) Philanthropic Responsibility |
| d) Economic Responsibility      |
- 3) \_\_\_\_\_ in the business context occurs when employees receive preferential treatment on grounds that are not directly related to their qualifications and performance in the job.
 

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| a) Right and Duties  | b) Discrimination          |
| c) Employees Privacy | d) Due process and layoffs |
- 4) \_\_\_\_\_ is just one aspect of marketing communications.
 

|                         |                   |
|-------------------------|-------------------|
| a) Advertisement        | b) Product Policy |
| c) Marketing Management | d) None of these  |
- 5) CSO stands for what?
 

|                                  |
|----------------------------------|
| a) Civil society organization    |
| b) Consumer Society organization |
| c) Central Statistics office     |
| d) None of these                 |
- 6) \_\_\_\_\_ is an attempt by one or more parties to achieve certain objectives by urging individual consumers to refrain from making selected purchases in the marketplace.
 

|             |                              |
|-------------|------------------------------|
| a) Boycott  | b) Demonstration and marches |
| c) Protests | d) Occupations               |
- 7) Government is stakeholder of organization.
 

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| a) True | b) False |
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- 8) \_\_\_\_\_ is the long- term maintenance of the system according to environmental and economical and Social consideration.
- |                    |                   |
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| a) Security        | b) Sustainability |
| c) Business Ethics | d) None of above  |
- 9) Functions of Civil Society are \_\_\_\_\_.
- |                    |                 |
|--------------------|-----------------|
| a) Protection      | b) Monitoring   |
| c) Social Cohesion | d) All of above |
- 10) \_\_\_\_\_ is the study of business situation activities and decisions where issues of rights and wrong are addressed
- |                       |                        |
|-----------------------|------------------------|
| a) Business Decisions | b) Business Situations |
| c) Business Theories  | d) Business Ethics     |
- 11) Some businessman do \_\_\_\_\_ by indulging in unfair trade practices like black-marketing, artificial high pricing, cheating in weight and measures, selling of duplicate and harmful products etc.
- |                          |                        |
|--------------------------|------------------------|
| a) Business Decisions    | b) Business Situations |
| c) Business Malpractices | d) Business Ethics     |
- 12) In \_\_\_\_\_ the degree to which one is autonomous and driven primarily to act for the benefit of ones self, contrasted with a more social orientation that emphasize group working and community goals.
- |                               |                       |
|-------------------------------|-----------------------|
| a) Individualism/Collectivism | b) Power Distance     |
| c) Uncertainty Avoidance      | d) Masculine Approach |
- 13) \_\_\_\_\_ is managing any area of business, whether it is production, marketing accounting, human resources or any other functions constitute a whole range of activities covering formal and informal means of planning, implementing and control.
- |                        |                               |
|------------------------|-------------------------------|
| a) Business Decisions  | b) Business Ethics            |
| c) Business Situations | d) Business Ethics Management |
- 14) \_\_\_\_\_ commit organisation, industries or professionals to specific beliefs, values and actions that set our appropriate ethical behaviour for employees.
- |                        |                    |
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| a) Code of ethics      | b) Code of conduct |
| c) Business Situations | c) Business Ethics |

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**Set S**

**T.Y. (B. Tech) (Sem- I) (New) (CBCS) Examination: Oct/Nov- 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Business Ethics**

Day & Date: Tuesday, 07-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Define Business ethics & explain its importance.
- b) Define globalization & explain issues in globalization.
- c) Explain the stages in ethical decision making.
- d) Explain concept of corporate citizenship & its 3 perspective.
- e) Explain the components of business ethics management.

**Q.3 Solve any two of the following.** **12**

- a) Elaborate Individual and situational influences on decision making.
- b) Explain 4 port model of CSR
- c) Explain normative ethical theories.

**Section – II**

**Q.4 Solve any four of the following.** **16**

- a) What are implications of globalization for business relations with government?
- b) Define environmental ethics & environmental responsibilities.
- c) Explain the functions of CSO.
- d) Explain the ethical issues in firm-employee relationship.
- e) Explain IT code of conduct.

**Q.5 Solve any two of the following.** **12**

- a) Explain how government act as a stakeholder of a business.
- b) Define CSO & explain the ethical issues in CSO.
- c) Define stakeholders & explain who are stakeholders of any business.

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Energy Management System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Smart Grid Technology comprises the following:
  - a) AMI, PLM, OMS, Renewable Integration, Microgrid,
  - b) DR/DSM, Distribution Automation, Energy Efficient Systems
  - c) All of the above
  - d) None of the above
- 2) What is the role of Sensor in smart grid architecture of IoT?
  - a) Store data
  - b) Manage data
  - c) Collect data
  - d) Security
- 3) Smart Grid technologies are aimed at improvement of \_\_\_\_\_.
  - a) Only Power Transmission System
  - b) Only Power Distribution system
  - c) Both Power Transmission & Distribution System
  - d) Neither Power Transmission nor Power Distribution system
- 4) In a Smart Grid ECO System, a normal consumer is expected to be able to turn to \_\_\_\_\_.
  - a) a non-consumer
  - b) a careful consumer
  - c) a Prosumer
  - d) Both careful consumer and Prosumer
- 5) What is the full form of DR in the context of Smart Grids?
  - a) Delivery Rate
  - b) Divide & Rule
  - c) Demand Response
  - d) Demand Recycle
- 6) Sensors can be used for the following purposes in Smart Grids.
  - a) Detect mechanical failures, tower collapses, extreme mechanical conditions.
  - b) Real time mechanical and electrical conditions of power lines
  - c) Diagnose imminent as well as permanent faults
  - d) All Above
- 7) A localized grouping of electricity generations, energy storages, and loads is termed as \_\_\_\_\_.
  - a) Virtual Power Plant
  - b) Macro Grid
  - c) Micro Grid
  - d) Traditional Grid

- 8) A system that integrates several types of power sources, (wind-turbines, hydro, Photovoltaics and batteries) to give a reliable overall power supply is termed as?
- a) Virtual Power Plant
  - b) Macro Grid
  - c) Micro Grid
  - d) Traditional Grid
- 9) How much power is lost in the grid due to resistance?
- a) 2-5%
  - b) 7-10%
  - c) 11-14%
  - d) 15-18%
- 10) Advanced Control Methods Technology Area include all but:
- a) Operational Applications
  - b) Fault Tolerance
  - c) Distributed Intelligent Agents
  - d) Analytical Tools
- 11) Smart Grid goals include all but the following:
- a) Potentially Reducing Our Carbon Foot-print
  - b) Introducing advancements and efficiencies yet to be envisioned
  - c) Assimilate all cultures to become American
  - d) Maintaining Grid Affordability
- 12) Distributed Intelligent Agents include all of the following, except:
- a) Dynamic distributed power control
  - b) Digital Protective Relays
  - c) Grid friendly appliances
  - d) Meter Reading Frequency
- 13) Monitor target of the smart \_\_\_\_\_ includes sensor objects in the power link.
- a) Perception layer
  - b) Smart network layer
  - c) Smart Application layer
  - d) Data layer
- 14) Which is the example for smart grid edge device for utility?
- a) Smart Meters
  - b) Smart Home
  - c) Smart Car
  - d) Smart Collage

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Energy Management System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Define smart grid. Differentiate between conventional grid and smart grid.
- b) Describe the opportunities and challenges related to smart grid.
- c) Explain the Evolution of Electric Grid.
- d) Define smart grid and describe the Need for smart Grid.
- e) What are the challenges and benefits of smart grid?

**Q.3 Solve Any Two** **12**

- a) Discuss the Evolution of Meter Reading.
- b) Explain energy management system in smart grid.
- c) Explain the communication network topologies used for data transmission in advanced Metering infrastructure.

**Section – II**

**Q.4 Solve any four** **16**

- a) What are the Advances in Energy Management Systems for the Smart Grid?
- b) Define the AMI standards.
- c) Explain EMC and its importance in smart grid.
- d) Write note on 'TP based Protocol'.
- e) Give the Applications of Phasor Measurement Unit

**Q.5 Solve any Two** **12**

- a) Explain the protection & control Strategy implemented in smart grid.
- b) Describe the Mitigation Approach to Cyber Security Risks
- c) Explain the application of Intelligent Electronic Devices.

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Energy Management System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A system that integrates several types of power sources, (wind-turbines, hydro, Photovoltaics and batteries) to give a reliable overall power supply is termed as?
  - a) Virtual Power Plant
  - b) Macro Grid
  - c) Micro Grid
  - d) Traditional Grid
- 2) How much power is lost in the grid due to resistance?
  - a) 2-5%
  - b) 7-10%
  - c) 11-14%
  - d) 15-18%
- 3) Advanced Control Methods Technology Area include all but:
  - a) Operational Applications
  - b) Fault Tolerance
  - c) Distributed Intelligent Agents
  - d) Analytical Tools
- 4) Smart Grid goals include all but the following:
  - a) Potentially Reducing Our Carbon Foot-print
  - b) Introducing advancements and efficiencies yet to be envisioned
  - c) Assimilate all cultures to become American
  - d) Maintaining Grid Affordability
- 5) Distributed Intelligent Agents include all of the following, except:
  - a) Dynamic distributed power control
  - b) Digital Protective Relays
  - c) Grid friendly appliances
  - d) Meter Reading Frequency
- 6) Monitor target of the smart \_\_\_\_\_ includes sensor objects in the power link.
  - a) Perception layer
  - b) Smart network layer
  - c) Smart Application layer
  - d) Data layer
- 7) Which is the example for smart grid edge device for utility?
  - a) Smart Meters
  - b) Smart Home
  - c) Smart Car
  - d) Smart Collage



- 8) Smart Grid Technology comprises the following:
- a) AMI, PLM, OMS, Renewable Integration, Microgrid,
  - b) DR/DSM, Distribution Automation, Energy Efficient Systems
  - c) All of the above
  - d) None of the above
- 9) What is the role of Sensor in smart grid architecture of IoT?
- a) Store data
  - b) Manage data
  - c) Collect data
  - d) Security
- 10) Smart Grid technologies are aimed at improvement of \_\_\_\_\_
- a) Only Power Transmission System
  - b) Only Power Distribution system
  - c) Both Power Transmission & Distribution System
  - d) Neither Power Transmission nor Power Distribution system
- 11) In a Smart Grid ECO System, a normal consumer is expected to be able to turn to \_\_\_\_\_.
- a) a non-consumer
  - b) a careful consumer
  - c) a Prosumer
  - d) Both careful consumer and Prosumer
- 12) What is the full form of DR in the context of Smart Grids?
- a) Delivery Rate
  - b) Divide & Rule
  - c) Demand Response
  - d) Demand Recycle
- 13) Sensors can be used for the following purposes in Smart Grids.
- a) Detect mechanical failures, tower collapses, extreme mechanical conditions.
  - b) Real time mechanical and electrical conditions of power lines
  - c) Diagnose imminent as well as permanent faults
  - d) All Above
- 14) A localized grouping of electricity generations, energy storages, and loads is termed as \_\_\_\_\_
- a) Virtual Power Plant
  - b) Macro Grid
  - c) Micro Grid
  - d) Traditional Grid

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Energy Management System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Define smart grid. Differentiate between conventional grid and smart grid.
- b) Describe the opportunities and challenges related to smart grid.
- c) Explain the Evolution of Electric Grid.
- d) Define smart grid and describe the Need for smart Grid.
- e) What are the challenges and benefits of smart grid?

**Q.3 Solve Any Two** **12**

- a) Discuss the Evolution of Meter Reading.
- b) Explain energy management system in smart grid.
- c) Explain the communication network topologies used for data transmission in advanced Metering infrastructure.

**Section – II**

**Q.4 Solve any four** **16**

- a) What are the Advances in Energy Management Systems for the Smart Grid?
- b) Define the AMI standards.
- c) Explain EMC and its importance in smart grid.
- d) Write note on 'TP based Protocol'.
- e) Give the Applications of Phasor Measurement Unit

**Q.5 Solve any Two** **12**

- a) Explain the protection & control Strategy implemented in smart grid.
- b) Describe the Mitigation Approach to Cyber Security Risks
- c) Explain the application of Intelligent Electronic Devices.

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Energy Management System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Smart Grid goals include all but the following:
  - a) Potentially Reducing Our Carbon Foot-print
  - b) Introducing advancements and efficiencies yet to be envisioned
  - c) Assimilate all cultures to become American
  - d) Maintaining Grid Affordability
- 2) Distributed Intelligent Agents include all of the following, except:
  - a) Dynamic distributed power control
  - b) Digital Protective Relays
  - c) Grid friendly appliances
  - d) Meter Reading Frequency
- 3) Monitor target of the smart \_\_\_\_\_ includes sensor objects in the power link.
 

|                            |                        |
|----------------------------|------------------------|
| a) Perception layer        | b) Smart network layer |
| c) Smart Application layer | d) Data layer          |
- 4) Which is the example for smart grid edge device for utility?
 

|                 |                  |
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| a) Smart Meters | b) Smart Home    |
| c) Smart Car    | d) Smart Collage |
- 5) Smart Grid Technology comprises the following:
  - a) AMI, PLM, OMS, Renewable Integration, Microgrid,
  - b) DR/DSM, Distribution Automation, Energy Efficient Systems
  - c) All of the above
  - d) None of the above
- 6) What is the role of Sensor in smart grid architecture of IoT?
 

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| a) Store data   | b) Manage data |
| c) Collect data | d) Security    |
- 7) Smart Grid technologies are aimed at improvement of \_\_\_\_\_
  - a) Only Power Transmission System
  - b) Only Power Distribution system
  - c) Both Power Transmission & Distribution System
  - d) Neither Power Transmission nor Power Distribution system

- 8) In a Smart Grid ECO System, a normal consumer is expected to be able to turn to \_\_\_\_\_.  
a) a non-consumer  
b) a careful consumer  
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d) Both careful consumer and Prosumer
- 9) What is the full form of DR in the context of Smart Grids?  
a) Delivery Rate  
b) Divide & Rule  
c) Demand Response  
d) Demand Recycle
- 10) Sensors can be used for the following purposes in Smart Grids.  
a) Detect mechanical failures, tower collapses, extreme mechanical conditions.  
b) Real time mechanical and electrical conditions of power lines  
c) Diagnose imminent as well as permanent faults  
d) All Above
- 11) A localized grouping of electricity generations, energy storages, and loads is termed as \_\_\_\_\_.  
a) Virtual Power Plant  
b) Macro Grid  
c) Micro Grid  
d) Traditional Grid
- 12) A system that integrates several types of power sources, (wind-turbines, hydro, Photovoltaics and batteries) to give a reliable overall power supply is termed as?  
a) Virtual Power Plant  
b) Macro Grid  
c) Micro Grid  
d) Traditional Grid
- 13) How much power is lost in the grid due to resistance?  
a) 2-5%  
b) 7-10%  
c) 11-14%  
d) 15-18%
- 14) Advanced Control Methods Technology Area include all but:  
a) Operational Applications  
b) Fault Tolerance  
c) Distributed Intelligent Agents  
d) Analytical Tools

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Energy Management System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Define smart grid. Differentiate between conventional grid and smart grid.
- b) Describe the opportunities and challenges related to smart grid.
- c) Explain the Evolution of Electric Grid.
- d) Define smart grid and describe the Need for smart Grid.
- e) What are the challenges and benefits of smart grid?

**Q.3 Solve Any Two** **12**

- a) Discuss the Evolution of Meter Reading.
- b) Explain energy management system in smart grid.
- c) Explain the communication network topologies used for data transmission in advanced Metering infrastructure.

**Section – II**

**Q.4 Solve any four** **16**

- a) What are the Advances in Energy Management Systems for the Smart Grid?
- b) Define the AMI standards.
- c) Explain EMC and its importance in smart grid.
- d) Write note on 'TP based Protocol'.
- e) Give the Applications of Phasor Measurement Unit

**Q.5 Solve any Two** **12**

- a) Explain the protection & control Strategy implemented in smart grid.
- b) Describe the Mitigation Approach to Cyber Security Risks
- c) Explain the application of Intelligent Electronic Devices.

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Energy Management System**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Sensors can be used for the following purposes in Smart Grids.
  - a) Detect mechanical failures, tower collapses, extreme mechanical conditions.
  - b) Real time mechanical and electrical conditions of power lines
  - c) Diagnose imminent as well as permanent faults
  - d) All Above
- 2) A localized grouping of electricity generations, energy storages, and loads is termed as \_\_\_\_\_.
 

|                        |                     |
|------------------------|---------------------|
| a) Virtual Power Plant | b) Macro Grid       |
| c) Micro Grid          | d) Traditional Grid |
- 3) A system that integrates several types of power sources, (wind-turbines, hydro, Photovoltaics and batteries) to give a reliable overall power supply is termed as?
 

|                        |                     |
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| a) Virtual Power Plant | b) Macro Grid       |
| c) Micro Grid          | d) Traditional Grid |
- 4) How much power is lost in the grid due to resistance?
 

|           |           |
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| a) 2-5%   | b) 7-10%  |
| c) 11-14% | d) 15-18% |
- 5) Advanced Control Methods Technology Area include all but:
 

|                                   |                     |
|-----------------------------------|---------------------|
| a) Operational Applications       | b) Fault Tolerance  |
| c) Distributed Intelligent Agents | d) Analytical Tools |
- 6) Smart Grid goals include all but the following:
  - a) Potentially Reducing Our Carbon Foot-print
  - b) Introducing advancements and efficiencies yet to be envisioned
  - c) Assimilate all cultures to become American
  - d) Maintaining Grid Affordability
- 7) Distributed Intelligent Agents include all of the following, except:
  - a) Dynamic distributed power control
  - b) Digital Protective Relays
  - c) Grid friendly appliances
  - d) Meter Reading Frequency

- 8) Monitor target of the smart \_\_\_\_\_ includes sensor objects in the power link.  
a) Perception layer                      b) Smart network layer  
c) Smart Application layer              d) Data layer
- 9) Which is the example for smart grid edge device for utility?  
a) Smart Meters                          b) Smart Home  
c) Smart Car                                d) Smart Collage
- 10) Smart Grid Technology comprises the following:  
a) AMI, PLM, OMS, Renewable Integration, Microgrid,  
b) DR/DSM, Distribution Automation, Energy Efficient Systems  
c) All of the above  
d) None of the above
- 11) What is the role of Sensor in smart grid architecture of IoT?  
a) Store data                                b) Manage data  
c) Collect data                              d) Security
- 12) Smart Grid technologies are aimed at improvement of \_\_\_\_\_  
a) Only Power Transmission System  
b) Only Power Distribution system  
c) Both Power Transmission & Distribution System  
d) Neither Power Transmission nor Power Distribution system
- 13) In a Smart Grid ECO System, a normal consumer is expected to be able to turn to \_\_\_\_\_.  
a) a non-consumer  
b) a careful consumer  
c) a Prosumer  
d) Both careful consumer and Prosumer
- 14) What is the full form of DR in the context of Smart Grids?  
a) Delivery Rate                          b) Divide & Rule  
c) Demand Response                    d) Demand Recycle

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Smart Energy Management System**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Define smart grid. Differentiate between conventional grid and smart grid.
- b) Describe the opportunities and challenges related to smart grid.
- c) Explain the Evolution of Electric Grid.
- d) Define smart grid and describe the Need for smart Grid.
- e) What are the challenges and benefits of smart grid?

**Q.3 Solve Any Two** **12**

- a) Discuss the Evolution of Meter Reading.
- b) Explain energy management system in smart grid.
- c) Explain the communication network topologies used for data transmission in advanced Metering infrastructure.

**Section – II**

**Q.4 Solve any four** **16**

- a) What are the Advances in Energy Management Systems for the Smart Grid?
- b) Define the AMI standards.
- c) Explain EMC and its importance in smart grid.
- d) Write note on 'TP based Protocol'.
- e) Give the Applications of Phasor Measurement Unit

**Q.5 Solve any Two** **12**

- a) Explain the protection & control Strategy implemented in smart grid.
- b) Describe the Mitigation Approach to Cyber Security Risks
- c) Explain the application of Intelligent Electronic Devices.



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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Electric Motors and Controls for Electric Vehicle**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is used to build a electric drive?
  - a) Source
  - b) Motor
  - c) Control unit
  - d) All of the mentioned
- 2) Which of the following is/are components of an electric drive?
  - a) Control unit and Power Modulator
  - b) Electric Motor and Control System
  - c) Input Command
  - d) Sensing Device and Electric Motor
- 3) Which of the following exhibits linearly rising load torque characteristics?
  - a) Rolling Mills
  - b) Fan load
  - c) Separately excited de generator connected to the resistive load
  - d) Sensed signal
- 4) Type-A chopper is used for obtaining which type of mode?
  - a) Reverse motoring mode
  - b) Motoring mode
  - c) Reverse regenerative braking mode
  - d) Regenerative braking mode
- 5) The selection of an electric motor for any application depends on which of the following factors?
  - a) Electrical characteristics
  - b) Mechanical characteristics
  - c) Size and rating of motors
  - d) All of the above
- 6) Which of the following devices should be used as a switch for high power and high voltage application?
  - a) TRIAC
  - b) Thyristor
  - c) GTO
  - d) MOSFET

- 7) The most suitable control-motor application is \_\_\_\_\_.  
a) AC one-phase induction motor    b) DC shunt motor  
c) AC shunt motor    d) DC separately motor
- 8) Which of these is the purpose of power-split device?  
a) To split Electrical Energy into Mechanical Energy  
b) To allow both the engine and Electric motor to propel the vehicle  
c) To recharge the battery while braking  
d) To recharge the brakes while driving
- 9) Which starting method is the best method in Induction motor?  
a) Direct online starting    b) Reactance starting  
c) Star-Delta starting    d) Autotransformer starting
- 10) The Field Oriented Control (FOC) enables the induction machine being controlled alike the \_\_\_\_\_.  
a) Separately excited DC Machine  
b) Permanent magnet DC machine  
c) Switched reluctance machine Option  
d) Stepper motor
- 11) Electric motors are ideal for vehicular applications because of \_\_\_\_\_.  
a) The torque speed characteristics  
b) The VI characteristics  
c) The Pd characteristics  
d) The alpha delta characteristics
- 12) Stator voltage control for speed control of induction motors is suitable for \_\_\_\_\_.  
a) Fan and pump drives    b) Drive of a crane  
c) Running it as generator    d) Constant load drive
- 13) In V/F control of a 3- Phase Induction Motor, if voltage is increased by 10%, in order to keep air gap flux constant, what is the % increment or decrement in frequency?  
a) Frequency is decreased by 10%  
b) Frequency is decreased by 20%  
c) Frequency is increased by 10%  
d) Frequency is increased by 20%
- 14) In a four -quadrant operation of an electric machine, the third operation is \_\_\_\_\_.  
a) Forward motoring    b) Reverse braking  
c) Forward braking    d) Reverse motoring

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Motors and Controls for Electric Vehicle**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) Draw and explain the block diagram of switched reluctance motor drive system.
- b) With neat diagram explain brushless DC Motor.
- c) Explain the two-quadrant operation of chopper DC motor drive with suitable waveforms for electric vehicle.
- d) Explain the configuration of v/f-controlled induction motor drive with field-weakening mode and constant-torque mode.
- e) Explain briefly the electrical and mechanical constraints to be considered while sizing an electrical machine for EV.

**Q.3 Attempt any TWO.** **12**

- a) Explain the four-quadrant chopper control of dc motor.
- b) What is the advantage of AC motor over DC motors for EV applications?
- c) What is its typical value for Induction Motors used in HEV applications?

**Section - II**

**Q.4 Attempt any FOUR.** **16**

- a) Explain Field oriented control of induction machines theory using DC drive analogy.
- b) Justify why induction motor mature technology among commutator less motor drives.
- c) With a neat graph(s) discuss in detail about the power and torque characteristics of various motors suitable for EV application.
- d) Explain Various Control Strategy used in Electric Vehicle.
- e) Discuss various electric drive train topologies.

**Q.5 Attempt any TWO.** **12**

- a) Describe construction and working principle of separately excited DC motor its single phase and three phase converters with the performance parameter, characteristics, operational waveform and with freewheeling Diode scheme.
- b) What is mean by time control ratio and frequency modulation system?
- c) Comment on the suitability of DC and AC machines for electric vehicle applications.

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Electric Motors and Controls for Electric Vehicle**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of these is the purpose of power-split device?
  - a) To split Electrical Energy into Mechanical Energy
  - b) To allow both the engine and Electric motor to propel the vehicle
  - c) To recharge the battery while braking
  - d) To recharge the brakes while driving
- 2) Which starting method is the best method in Induction motor?
  - a) Direct online starting
  - b) Reactance starting
  - c) Star-Delta starting
  - d) Autotransformer starting
- 3) The Field Oriented Control (FOC) enables the induction machine being controlled alike the \_\_\_\_\_.
  - a) Separately excited DC Machine
  - b) Permanent magnet DC machine
  - c) Switched reluctance machine Option
  - d) Stepper motor
- 4) Electric motors are ideal for vehicular applications because of \_\_\_\_\_.
  - a) The torque speed characteristics
  - b) The VI characteristics
  - c) The Pd characteristics
  - d) The alpha delta characteristics
- 5) Stator voltage control for speed control of induction motors is suitable for \_\_\_\_\_.
  - a) Fan and pump drives
  - b) Drive of a crane
  - c) Running it as generator
  - d) Constant load drive
- 6) In V/F control of a 3- Phase Induction Motor, if voltage is increased by 10%, in order to keep air gap flux constant, what is the % increment or decrement in frequency?
  - a) Frequency is decreased by 10%
  - b) Frequency is decreased by 20%
  - c) Frequency is increased by 10%
  - d) Frequency is increased by 20%

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Motors and Controls for Electric Vehicle**

Day & Date: Thursday, 16-02-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any FOUR.** **16**
- a) Draw and explain the block diagram of switched reluctance motor drive system.
  - b) With neat diagram explain brushless DC Motor.
  - c) Explain the two-quadrant operation of chopper DC motor drive with suitable waveforms for electric vehicle.
  - d) Explain the configuration of v/f-controlled induction motor drive with field-weakening mode and constant-torque mode.
  - e) Explain briefly the electrical and mechanical constraints to be considered while sizing an electrical machine for EV.
- Q.3 Attempt any TWO.** **12**
- a) Explain the four-quadrant chopper control of dc motor.
  - b) What is the advantage of AC motor over DC motors for EV applications?
  - c) What is its typical value for Induction Motors used in HEV applications?

**Section - II**

- Q.4 Attempt any FOUR.** **16**
- a) Explain Field oriented control of induction machines theory using DC drive analogy.
  - b) Justify why induction motor mature technology among commutator less motor drives.
  - c) With a neat graph(s) discuss in detail about the power and torque characteristics of various motors suitable for EV application.
  - d) Explain Various Control Strategy used in Electric Vehicle.
  - e) Discuss various electric drive train topologies.
- Q.5 Attempt any TWO.** **12**
- a) Describe construction and working principle of separately excited DC motor its single phase and three phase converters with the performance parameter, characteristics, operational waveform and with freewheeling Diode scheme.
  - b) What is mean by time control ratio and frequency modulation system?
  - c) Comment on the suitability of DC and AC machines for electric vehicle applications.

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Electric Motors and Controls for Electric Vehicle**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Electric motors are ideal for vehicular applications because of \_\_\_\_\_.
  - a) The torque speed characteristics
  - b) The VI characteristics
  - c) The Pd characteristics
  - d) The alpha delta characteristics
- 2) Stator voltage control for speed control of induction motors is suitable for \_\_\_\_\_.
  - a) Fan and pump drives
  - b) Drive of a crane
  - c) Running it as generator
  - d) Constant load drive
- 3) In V/F control of a 3- Phase Induction Motor, if voltage is increased by 10%, in order to keep air gap flux constant, what is the % increment or decrement in frequency?
  - a) Frequency is decreased by 10%
  - b) Frequency is decreased by 20%
  - c) Frequency is increased by 10%
  - d) Frequency is increased by 20%
- 4) In a four -quadrant operation of an electric machine, the third operation is \_\_\_\_\_.
  - a) Forward motoring
  - b) Reverse braking
  - c) Forward braking
  - d) Reverse motoring
- 5) Which of the following is used to build a electric drive?
  - a) Source
  - b) Motor
  - c) Control unit
  - d) All of the mentioned
- 6) Which of the following is/are components of an electric drive?
  - a) Control unit and Power Modulator
  - b) Electric Motor and Control System
  - c) Input Command
  - d) Sensing Device and Electric Motor

- 7) Which of the following exhibits linearly rising load torque characteristics?
- a) Rolling Mills
  - b) Fan load
  - c) Separately excited de generator connected to the resistive load
  - d) Sensed signal
- 8) Type-A chopper is used for obtaining which type of mode?
- a) Reverse motoring mode
  - b) Motoring mode
  - c) Reverse regenerative braking mode
  - d) Regenerative braking mode
- 9) The selection of an electric motor for any application depends on which of the following factors?
- a) Electrical characteristics
  - b) Mechanical characteristics
  - c) Size and rating of motors
  - d) All of the above
- 10) Which of the following devices should be used as a switch for high power and high voltage application?
- a) TRIAC
  - b) Thyristor
  - c) GTO
  - d) MOSFET
- 11) The most suitable control-motor application is \_\_\_\_.
- a) AC one-phase induction motor
  - b) DC shunt motor
  - c) AC shunt motor
  - d) DC separately motor
- 12) Which of these is the purpose of power-split device?
- a) To split Electrical Energy into Mechanical Energy
  - b) To allow both the engine and Electric motor to propel the vehicle
  - c) To recharge the battery while braking
  - d) To recharge the brakes while driving
- 13) Which starting method is the best method in Induction motor?
- a) Direct online starting
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  - c) Star-Delta starting
  - d) Autotransformer starting
- 14) The Field Oriented Control (FOC) enables the induction machine being controlled alike the \_\_\_\_.
- a) Separately excited DC Machine
  - b) Permanent magnet DC machine
  - c) Switched reluctance machine Option
  - d) Stepper motor



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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Motors and Controls for Electric Vehicle**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any FOUR.** **16**

- a) Draw and explain the block diagram of switched reluctance motor drive system.
- b) With neat diagram explain brushless DC Motor.
- c) Explain the two-quadrant operation of chopper DC motor drive with suitable waveforms for electric vehicle.
- d) Explain the configuration of v/f-controlled induction motor drive with field-weakening mode and constant-torque mode.
- e) Explain briefly the electrical and mechanical constraints to be considered while sizing an electrical machine for EV.

**Q.3 Attempt any TWO.** **12**

- a) Explain the four-quadrant chopper control of dc motor.
- b) What is the advantage of AC motor over DC motors for EV applications?
- c) What is its typical value for Induction Motors used in HEV applications?

**Section - II**

**Q.4 Attempt any FOUR.** **16**

- a) Explain Field oriented control of induction machines theory using DC drive analogy.
- b) Justify why induction motor mature technology among commutator less motor drives.
- c) With a neat graph(s) discuss in detail about the power and torque characteristics of various motors suitable for EV application.
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**Q.5 Attempt any TWO.** **12**

- a) Describe construction and working principle of separately excited DC motor its single phase and three phase converters with the performance parameter, characteristics, operational waveform and with freewheeling Diode scheme.
- b) What is mean by time control ratio and frequency modulation system?
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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Electric Motors and Controls for Electric Vehicle**

Day & Date: Thursday, 16-02-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following devices should be used as a switch for high power and high voltage application?
 

|          |              |
|----------|--------------|
| a) TRIAC | b) Thyristor |
| c) GTO   | d) MOSFET    |
- 2) The most suitable control-motor application is \_\_\_\_\_.
 

|                                 |                        |
|---------------------------------|------------------------|
| a) AC one-phase induction motor | b) DC shunt motor      |
| c) AC shunt motor               | d) DC separately motor |
- 3) Which of these is the purpose of power-split device?
 

|                                                                      |
|----------------------------------------------------------------------|
| a) To split Electrical Energy into Mechanical Energy                 |
| b) To allow both the engine and Electric motor to propel the vehicle |
| c) To recharge the battery while braking                             |
| d) To recharge the brakes while driving                              |
- 4) Which starting method is the best method in Induction motor?
 

|                           |                             |
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| a) Direct online starting | b) Reactance starting       |
| c) Star-Delta starting    | d) Autotransformer starting |
- 5) The Field Oriented Control (FOC) enables the induction machine being controlled alike the \_\_\_\_\_.
 

|                                       |
|---------------------------------------|
| a) Separately excited DC Machine      |
| b) Permanent magnet DC machine        |
| c) Switched reluctance machine Option |
| d) Stepper motor                      |
- 6) Electric motors are ideal for vehicular applications because of \_\_\_\_\_.
 

|                                     |
|-------------------------------------|
| a) The torque speed characteristics |
| b) The VI characteristics           |
| c) The Pd characteristics           |
| d) The alpha delta characteristics  |
- 7) Stator voltage control for speed control of induction motors is suitable for \_\_\_\_\_.
 

|                            |                        |
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| a) Fan and pump drives     | b) Drive of a crane    |
| c) Running it as generator | d) Constant load drive |

- 8) In V/F control of a 3- Phase Induction Motor, if voltage is increased by 10%, in order to keep air gap flux constant, what is the % increment or decrement in frequency?
- a) Frequency is decreased by 10%
  - b) Frequency is decreased by 20%
  - c) Frequency is increased by 10%
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- 9) In a four -quadrant operation of an electric machine, the third operation is \_\_\_\_\_.
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- 10) Which of the following is used to build a electric drive?
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- 14) The selection of an electric motor for any application depends on which of the following factors?
- a) Electrical characteristics
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  - c) Size and rating of motors
  - d) All of the above

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**T.Y (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Motors and Controls for Electric Vehicle**

Day & Date: Thursday, 16-02-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Attempt any FOUR. 16**
- Draw and explain the block diagram of switched reluctance motor drive system.
  - With neat diagram explain brushless DC Motor.
  - Explain the two-quadrant operation of chopper DC motor drive with suitable waveforms for electric vehicle.
  - Explain the configuration of v/f-controlled induction motor drive with field-weakening mode and constant-torque mode.
  - Explain briefly the electrical and mechanical constraints to be considered while sizing an electrical machine for EV.
- Q.3 Attempt any TWO. 12**
- Explain the four-quadrant chopper control of dc motor.
  - What is the advantage of AC motor over DC motors for EV applications?
  - What is its typical value for Induction Motors used in HEV applications?

**Section - II**

- Q.4 Attempt any FOUR. 16**
- Explain Field oriented control of induction machines theory using DC drive analogy.
  - Justify why induction motor mature technology among commutator less motor drives.
  - With a neat graph(s) discuss in detail about the power and torque characteristics of various motors suitable for EV application.
  - Explain Various Control Strategy used in Electric Vehicle.
  - Discuss various electric drive train topologies.
- Q.5 Attempt any TWO. 12**
- Describe construction and working principle of separately excited DC motor its single phase and three phase converters with the performance parameter, characteristics, operational waveform and with freewheeling Diode scheme.
  - What is mean by time control ratio and frequency modulation system?
  - Comment on the suitability of DC and AC machines for electric vehicle applications.

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private
- 3) Who is known as father of economics?
  - a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 4) Which of these is an economic activity?
  - a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 5) Market system means: \_\_\_\_\_.
  - a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above
- 6) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 7) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above

- 8)** Which one of the following is not the function of money?
- a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 9)** Which one of the following is the objective of the RBI?
- a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 10)** Which one of the following cost can never become zero?
- |                  |                  |
|------------------|------------------|
| a) Average cost  | b) Fixed cost    |
| c) Marginal cost | d) Variable cost |

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| <b>Set</b> | <b>P</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |                                                                                          |               |
|------------------------------------------------------------------------------------------|---------------|
| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Micro and Macro are not two independent approaches to economic analysis but they are complementary to each other.
  - a) False
  - b) True
  - c) Partly true
  - d) Partly False
- 2) Variable factor means those factors of production \_\_\_\_\_.
  - a) which can be only changed in the long run
  - b) which can be changed in the short run
  - c) which can be never be changed
  - d) All of the above
- 3) Which one of the following is not the function of money?
  - a) Medium of exchange
  - b) Measure of Happiness
  - c) Standard of deferred payment
  - d) Store of value
- 4) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
- 5) Which one of the following cost can never become zero?
  - a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 6) Microeconomic theory deals with \_\_\_\_\_.
  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
  - a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private



- 8)** Who is known as father of economics?
- a) Adam Smith
  - b) Prof. A. Samuelson
  - c) Alfred Marshall
  - d) J. R. Hicks
- 9)** Which of these is an economic activity?
- a) Father teaching his son at home instead of spending on coaching
  - b) A housewife making food for the family on her own
  - c) A hair dresser doing hair cut designing on payment
  - d) A singer giving a show on his son's wedding anniversary
- 10)** Market system means: \_\_\_\_\_.
- a) Socialism
  - b) Capitalism
  - c) A place where goods are traded
  - d) All of the above

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| <b>Set</b> | <b>Q</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

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| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which one of the following is the objective of the RBI?
  - a) To maintain term deposits of the households
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  - c) Marginal cost
  - d) Variable cost
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  - a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found \_\_\_\_\_.
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  - c) None
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- 10) Which one of the following is not the function of money?  
a) Medium of exchange  
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c) Standard of deferred payment  
d) Store of value

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- |                                                                                          |               |
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| <b>Q.2 Write short notes.</b>                                                            | <b>10</b>     |
| a) Nature of Economics                                                                   |               |
| b) Market Equilibrium                                                                    |               |
| <br><b>Q.3 Write short notes.</b>                                                        | <br><b>10</b> |
| a) Importance of money in economy                                                        |               |
| b) Consumption and Saving                                                                |               |
| <br><b>Q.4 Discuss the features of new economic policy in India.</b>                     | <br><b>10</b> |
| <br><b>Q.5 Explain the properties of perfect and imperfectly competitive market.</b>     | <br><b>10</b> |
| <br><b>Q.6 Define national income. Explain the methods of measuring national income.</b> | <br><b>10</b> |
| <br><b>Q.7 Define central bank, discuss the function of central banking in India.</b>    | <br><b>10</b> |

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

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  - d) A singer giving a show on his son's wedding anniversary
- 3) Market system means: \_\_\_\_\_.
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  - a) False
  - b) True
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  - c) Standard of deferred payment
  - d) Store of value

- 7) Which one of the following is the objective of the RBI?
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  - b) To ensure price stability
  - c) To arrange loans for the businessmen
  - d) None of the above
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- a) Average cost
  - b) Fixed cost
  - c) Marginal cost
  - d) Variable cost
- 9) Microeconomic theory deals with \_\_\_\_\_
- a) Economic behavior of individual economic decision-making units
  - b) Economy as whole
  - c) Trade relations
  - d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found \_\_\_\_\_
- a) Private only
  - b) Public only
  - c) None
  - d) Both (a) public and (b) private

**SLR-HL-399**

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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Economics**

Day & Date: Monday, 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) Attempt any four questions out of question no. 2 to 7.  
2) Figures to the right indicate full marks.

- Q.2 Write short notes.** **10**  
a) Nature of Economics  
b) Market Equilibrium
- Q.3 Write short notes.** **10**  
a) Importance of money in economy  
b) Consumption and Saving
- Q.4** Discuss the features of new economic policy in India. **10**
- Q.5** Explain the properties of perfect and imperfectly competitive market. **10**
- Q.6** Define national income. Explain the methods of measuring national income. **10**
- Q.7** Define central bank, discuss the function of central banking in India. **10**



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Set **P**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.**

**10**

- 1) Which is not a type of intellectual property?
  - a) Trade secrets
  - b) Trademarks
  - c) Home loans
  - d) Copyrights
- 2) In which article is intellectual property rights outlined?
  - a) Article 15
  - b) Article 27
  - c) Article 13
  - d) Article 20
- 3) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 4) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 5) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 6) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 7) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 8) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 9) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850

- 10)** All of the following are examples of intellectual property protections except \_\_\_\_.
- a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

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| <b>Set</b> | <b>P</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Set **Q**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options.****10**

- 1) What is the subject matter of a patent?
 

|          |              |
|----------|--------------|
| a) Art   | b) Invention |
| c) Goods | d) Ideas     |
- 2) What is copyright meant for?
 

|              |                 |
|--------------|-----------------|
| a) Film work | b) Books        |
| c) Essay     | d) All of these |
- 3) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
 

|                  |                     |
|------------------|---------------------|
| a) Ethical value | b) Moral value      |
| c) Social value  | d) Commercial value |
- 4) The first Patent Law was enacted in India in the year \_\_\_\_\_.
 

|         |         |
|---------|---------|
| a) 1856 | b) 1880 |
| c) 1905 | d) 1850 |
- 5) All of the following are examples of intellectual property protections except \_\_\_\_\_.
 

|              |               |
|--------------|---------------|
| a) Copyright | b) Patents    |
| c) Contracts | d) Trademarks |
- 6) Which is not a type of intellectual property?
 

|                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 7) In which article is intellectual property rights outlined?
 

|               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |
- 8) How long does intellectual property last? (after the death of the author)
 

|           |           |
|-----------|-----------|
| a) 10 yrs | b) 30 yrs |
| c) 60 yrs | d) 70 yrs |
- 9) Which of the following can you copyright?
 

|                       |            |
|-----------------------|------------|
| a) Literary work      | b) Ideas   |
| c) Choreographic work | d) Fashion |

- 10)** Which of the following identifies as a trademark?
- |                 |                       |
|-----------------|-----------------------|
| a) Name, symbol | b) Symbol, logo       |
| c) Logo, name   | d) Name, symbol, logo |

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| <b>Set</b> | <b>Q</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
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- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

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Marks:10

10

- Page 7 of 12

- 10)** Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_
- a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value



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| <b>Set</b> | <b>R</b> |
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**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks:10

**Q.1 Choose the correct alternatives from the given options. 10**

- 1) How long does intellectual property last? (after the death of the author)
  - a) 10 yrs
  - b) 30 yrs
  - c) 60 yrs
  - d) 70 yrs
- 2) Which of the following can you copyright?
  - a) Literary work
  - b) Ideas
  - c) Choreographic work
  - d) Fashion
- 3) Which of the following identifies as a trademark?
  - a) Name, symbol
  - b) Symbol, logo
  - c) Logo, name
  - d) Name, symbol, logo
- 4) What is the subject matter of a patent?
  - a) Art
  - b) Invention
  - c) Goods
  - d) Ideas
- 5) What is copyright meant for?
  - a) Film work
  - b) Books
  - c) Essay
  - d) All of these
- 6) Intellectual Property Rights (IPR) protect the use of information and ideas that are of \_\_\_\_\_.
  - a) Ethical value
  - b) Moral value
  - c) Social value
  - d) Commercial value
- 7) The first Patent Law was enacted in India in the year \_\_\_\_\_.
  - a) 1856
  - b) 1880
  - c) 1905
  - d) 1850
- 8) All of the following are examples of intellectual property protections except \_\_\_\_\_.
  - a) Copyright
  - b) Patents
  - c) Contracts
  - d) Trademarks

- 9)** Which is not a type of intellectual property?
- |                  |               |
|------------------|---------------|
| a) Trade secrets | b) Trademarks |
| c) Home loans    | d) Copyrights |
- 10)** In which article is intellectual property rights outlined?
- |               |               |
|---------------|---------------|
| a) Article 15 | b) Article 27 |
| c) Article 13 | d) Article 20 |

**SLR-HL-400**

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**Set S**

**T.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Intellectual Property Rights for Technology Development and Management**

Day & Date: Monday 20-02-2023  
Time: 10:00 AM To 12:00 PM

Max. Marks: 40

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Answer the following. (Any Two) 20**

- a) Explain the detail the role of WTO in protecting intellectual property rights.
- b) How the intellectual property is useful for Engineers. Explain in detail with example.
- c) Compare the Indian IPR system with international IPR framework.

**Q.3 Write short notes (Any Four) 20**

- a) Concept of valuation of Intellectual property and value realization
- b) Protection of traditional knowledge
- c) Bio technology and intellectual property
- d) TRIPS & Access to Medicines
- e) Concepts of confidentiality and information security
- f) Copy right issues in creative works

**Seat  
No.**

## Max. Marks: 70

- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks.
- 4) Use of Non-programable calculator is allowed.

Marks: 14

14

- Page 1 of 16

- 8)  $\nabla \times \vec{r} = ?$   
 a)  $i + j + k$  b) 0  
 c) 3 d)  $\sqrt{3}$
- 9) If  $\vec{a}$  is constant vector and  $\vec{r} = xi + yj + zk$  then  $\text{grad} (\vec{a} \cdot \vec{r}) = \underline{\hspace{2cm}}$ .  
 a)  $2\vec{a}$  b)  $\vec{a}$   
 c)  $\vec{r}$  d)  $2\vec{r}$
- 10) If  $u = e^{xy^2 z^3}$  then  $\frac{\partial u}{\partial z} = \underline{\hspace{2cm}}$ .  
 a)  $e^{xy^2 z^3} xy^2 z^3$  b)  $e^{xy^2 z^3} y^2 z^3$   
 c)  $e^{xy^2 z^3} 3xy^2 z^2$  d)  $e^{xy^2 z^3} 2xyz^3$
- 11) If  $g(x, y, z) = 0$  then the value of  $\frac{\partial z}{\partial x} = \underline{\hspace{2cm}}$ .  
 a)  $\frac{g_x}{g_z}$  b)  $\frac{g_z}{g_x}$   
 c)  $-\frac{g_z}{g_x}$  d)  $-\frac{g_x}{g_z}$
- 12) If  $u = \sin x, v = \cos y$  then the value of  $\underline{\hspace{2cm}}$ .  
 a)  $-\sin y \cos x$  b)  $-\sin x \cos y$   
 c)  $-\sin x \sin y$  d)  $-\cos x \cos y$
- 13) The percentage error in the area of a square when an error of 1% is made in measuring its length is  $\underline{\hspace{2cm}}$ .  
 a) 1 b) 2  
 c) 3 d) 0
- 14) Directional derivative is maximum along  $\underline{\hspace{2cm}}$ .  
 a) Any unit vector b) Co-ordinate axes  
 c) Tangent to the surface d) Normal to the surface

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Set **P**

**F.Y (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – I**

Day & Date: Monday, 13-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Use of non-programable calculator is allowed.  
 3) Figures to right indicate full marks.

**Section – I**

**Q.2 Attempt any Three question from the following.** **09**

- a) Find the nth derivative of  $y = \sin x \cos x \cos 2x$
- b) Verify Cayley Hamilton theorem for  $A$  where  $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{pmatrix}$
- c) Investigate for what value of  $\mu$  and  $\lambda$  the equations.  
 $2x + 3y + 5z = 9$ ,  $7x + 3y - 2z = 8$ ,  $2x + 3y + \lambda z = \mu$  will have  
 (a) no solution, (b) infinite solution, (c) unique solution
- d) Expand  $x^5 - 5x^4 + 6x^3 - 7x^2 + 8x - 9$  in powers of  $(x - 1)$ .
- e) Expand  $\log \sec x$  in powers of  $x$  up to  $x^4$

**Q.3 Attempt any Three question from the following.** **09**

- a) Find the nth derivative of  $y = \frac{x-1}{x+1}$
- b) Prove that  $\tan^{-1} \left( \frac{\sqrt{1+x^2}-1}{x} \right) = \frac{1}{2} \left[ x + \frac{x^3}{3} + \frac{x^5}{5} + \dots \right]$
- c) Find the nth derivative of  $y = e^{-x} \cdot x \cdot \cos x$
- d) Examine the vector for Linear Dependence and Independence  
 $[1, 1, 1]$ ,  $[1, 2, 3]$ ,  $[2, 3, 8]$
- e) Find the rank of the matrix by reducing and it to Normal form  

$$\begin{pmatrix} 3 & 2 & 1 & 4 \\ -1 & 3 & 2 & 2 \\ 2 & 5 & 3 & 6 \\ 5 & 7 & 4 & 10 \end{pmatrix}$$

**Q.4 Attempt any Two questions from the following.** **10**

- a) If  $\cos^{-1} \left( \frac{y}{b} \right) = \log \left( \frac{x}{n} \right)^n$  then prove that  
 $x^2 y_{n+2} + (2n+1)xy_{n+1} + 2n^2 y_n = 0$
- b) Find the Eigen values and Eigen vector for the smallest Eigen value for  

$$A = \begin{pmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{pmatrix}$$
- c) Find the value of  $a, b, c$  if  

$$\lim_{x \rightarrow 0} \frac{x(a + b \cos x) - c \sin x}{x^5} = 1$$

## Section – II

**Q.5 Attempt any three questions from the following.** **09**

- a) Prove that  $\text{curl}(\vec{a} \times \vec{r}) = 2\vec{a}$
- b) Find the directional derivative of  $\phi = x^2y \cos z$  at  $(1, 2, \pi/2)$  in the direction of  $2i + 3j + 2k$ .
- c) If  $u = \log(\tan x + \tan y + \tan z)$   
Find the value of  $\sin 2x \frac{\partial u}{\partial x} + \sin 2y \frac{\partial u}{\partial y} + \sin 2z \frac{\partial u}{\partial z}$
- d) If  $x^y = y^x$  find  $\frac{dy}{dx}$
- e) Find the percentage error in  $g$  if the percentage errors in  $l$  and  $T$  are both  $-1$  for case of simple pendulum and the relation  $T = \frac{1}{2\pi} \sqrt{\frac{l}{g}}$

**Q.6 Attempt any three questions from the following.** **09**

- a) If  $u = F(e^{x-y}, e^{y-z}, e^{z-x})$  Prove that  $u_x + u_y + u_z = 0$
- b) If  $x = a \cosh u \cos v, y = a \sinh u \sin v$  find  $\frac{\partial(x,y)}{\partial(u,v)}$   
(Note: Derivative of  $\cosh x$  is  $\sinh x$ , derivative of  $\sinh x$  is  $\cosh x$  w.r.t.  $x$ )
- c) Find the angle between the normal to the surfaces  $x^2y + z = 3$  and  $x \log z - y^2 + 4 = 0$  at  $(-1, 2, 1)$ .
- d) A particle moves along the curve  $\vec{r} = (t^3 - 4t)i + (t^2 + 4t)j + (8t^2 - 3t^3)k$  where  $t$  denotes time. Show that the magnitudes of acceleration along the tangent and normal at  $t = 2$  are 16 and  $2\sqrt{73}$  respectively.
- e) Prove that  $\nabla \frac{1}{r^3} = \frac{-3\vec{r}}{r^5}$

**Q.7 Attempt any two questions from the following.** **10**

- a) If  $u = \sin^{-1} \left[ \frac{x^{1/4} + y^{1/4}}{x^{1/5} + y^{1/5}} \right]$  then find the values of  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$  and  $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$
- b) Find the stationary value of  $xy(1 - x - y)$
- c) Prove that  $\vec{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$  is irrotational. Find the function  $\phi$  such that  $\vec{F} = \nabla \phi$ .



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Set **Q**

**F.Y (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – I**

Day & Date: Monday, 13-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of Non-programable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.****14**

- 1)  $\nabla \times \vec{r} = ?$ 
  - a)  $i + j + k$
  - b) 0
  - c) 3
  - d)  $\sqrt{3}$
- 2) If  $\vec{a}$  is constant vector and  $\vec{r} = xi + yj + zk$  then  $\text{grad}(\vec{a} \cdot \vec{r}) = \underline{\hspace{2cm}}$ .
  - a)  $2\vec{a}$
  - b)  $\vec{a}$
  - c)  $\vec{r}$
  - d)  $2\vec{r}$
- 3) If  $u = e^{xy^2 z^3}$  then  $\frac{\partial u}{\partial z} = \underline{\hspace{2cm}}$ .
  - a)  $e^{xy^2 z^3} xy^2 z^3$
  - b)  $e^{xy^2 z^3} y^2 z^3$
  - c)  $e^{xy^2 z^3} 3xy^2 z^2$
  - d)  $e^{xy^2 z^3} 2xyz^3$
- 4) If  $g(x, y, z) = 0$  then the value of  $\frac{\partial z}{\partial x} = \underline{\hspace{2cm}}$ .
  - a)  $\frac{g_x}{g_z}$
  - b)  $\frac{g_z}{g_x}$
  - c)  $-\frac{g_z}{g_x}$
  - d)  $-\frac{g_x}{g_z}$
- 5) If  $u = \sin x, v = \cos y$  then the value of  $\underline{\hspace{2cm}}$ .
  - a)  $-\sin y \cos x$
  - b)  $-\sin x \cos y$
  - c)  $-\sin x \sin y$
  - d)  $-\cos x \cos y$
- 6) The percentage error in the area of a square when an error of 1% is made in measuring its length is  $\underline{\hspace{2cm}}$ .
  - a) 1
  - b) 2
  - c) 3
  - d) 0
- 7) Directional derivative is maximum along  $\underline{\hspace{2cm}}$ .
  - a) Any unit vector
  - b) Co-ordinate axes
  - c) Tangent to the surface
  - d) Normal to the surface
- 8) If  $y = \frac{x^n - 1}{x - 1}$  then  $y_n = \underline{\hspace{2cm}}$ .
  - a) 0
  - b)  $n!$
  - c) 1
  - d)  $(n - 1)!$

- 9) If  $y = \cos^2 x$  then  $y_n =$  \_\_\_\_\_.  
 a)  $-2^{n-1} \cos\left(2x + \frac{n\pi}{2}\right)$       b)  $2^{n-1} \cos\left(2x + \frac{n\pi}{2}\right)$   
 c)  $2^{n-1} \sin\left(2x + \frac{n\pi}{2}\right)$       d)  $2^{n+1} \sin\left(\frac{n\pi}{2}\right)$
- 10) If  $L = \lim_{n \rightarrow \infty} x^2 e^{-x}$  then  $L =$  \_\_\_\_\_.  
 a) 0      b) 1  
 c) 2      d) -2
- 11) If  $y = \log x$  then  $y_n =$  \_\_\_\_\_.  
 a)  $\frac{(-1)^n(n)!}{x^n}$       b)  $\frac{(-1)^n(n-1)!}{x^n}$   
 c)  $\frac{(-1)^{n-1}(n)!}{x^{n+1}}$       d)  $\frac{(-1)^{n-1}(n-1)!}{x^n}$
- 12) The expansion of  $y(x+h)$  in powers of  $x$  is \_\_\_\_\_.  
 a)  $y(x) + hy'(x) + \frac{h^2}{2!}y''(x) + \dots$       b)  $y(h) + xy'(h) + \frac{x^2}{2!}y''(h) + \dots$   
 c)  $y(h) - xy'(h) + \frac{x^2}{2!}y''(h) - \dots$       d)  $y(x) - hy'(x) + \frac{h^2}{2!}y''(x) - \dots$
- 13) If  $a \neq 0$  then the rank of matrix A is where  $A = \begin{pmatrix} a & a & a \\ a & a & a \\ a & a & a \end{pmatrix}$   
 a) 2      b) a  
 c) 0      d) 1
- 14) If 1, 1, 8 are eigen values and 5, 2, K are diagonal elements of matrix  $[A]_{3 \times 3}$ , then the value of K equals \_\_\_\_\_.  
 a) 0      b) 1  
 c) 2      d) 3

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Set **Q**

**F.Y (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – I**

Day & Date: Monday, 13-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Use of non-programable calculator is allowed.  
 3) Figures to right indicate full marks.

**Section – I**

**Q.2 Attempt any Three question from the following.**

**09**

- a) Find the nth derivative of  $y = \sin x \cos x \cos 2x$
- b) Verify Cayley Hamilton theorem for  $A$  where  $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{pmatrix}$
- c) Investigate for what value of  $\mu$  and  $\lambda$  the equations.  
 $2x + 3y + 5z = 9$ ,  $7x + 3y - 2z = 8$ ,  $2x + 3y + \lambda z = \mu$  will have  
 (a) no solution, (b) infinite solution, (c) unique solution
- d) Expand  $x^5 - 5x^4 + 6x^3 - 7x^2 + 8x - 9$  in powers of  $(x - 1)$ .
- e) Expand  $\log \sec x$  in powers of  $x$  up to  $x^4$

**Q.3 Attempt any Three question from the following.**

**09**

- a) Find the nth derivative of  $y = \frac{x-1}{x+1}$
- b) Prove that  $\tan^{-1} \left( \frac{\sqrt{1+x^2}-1}{x} \right) = \frac{1}{2} \left[ x + \frac{x^3}{3} + \frac{x^5}{5} + \dots \right]$
- c) Find the nth derivative of  $y = e^{-x} \cdot x \cdot \cos x$
- d) Examine the vector for Linear Dependence and Independence  
 $[1, 1, 1]$ ,  $[1, 2, 3]$ ,  $[2, 3, 8]$
- e) Find the rank of the matrix by reducing and it to Normal form  

$$\begin{pmatrix} 3 & 2 & 1 & 4 \\ -1 & 3 & 2 & 2 \\ 2 & 5 & 3 & 6 \\ 5 & 7 & 4 & 10 \end{pmatrix}$$

**Q.4 Attempt any Two questions from the following.**

**10**

- a) If  $\cos^{-1} \left( \frac{y}{b} \right) = \log \left( \frac{x}{n} \right)^n$  then prove that  
 $x^2 y_{n+2} + (2n+1)xy_{n+1} + 2n^2 y_n = 0$
- b) Find the Eigen values and Eigen vector for the smallest Eigen value for  

$$A = \begin{pmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{pmatrix}$$
- c) Find the value of  $a, b, c$  if  

$$\lim_{x \rightarrow 0} \frac{x(a + b \cos x) - c \sin x}{x^5} = 1$$

## Section – II

**Q.5 Attempt any three questions from the following.** **09**

- a) Prove that  $\text{curl}(\vec{a} \times \vec{r}) = 2\vec{a}$
- b) Find the directional derivative of  $\phi = x^2y \cos z$  at  $(1, 2, \pi/2)$  in the direction of  $2i + 3j + 2k$ .
- c) If  $u = \log(\tan x + \tan y + \tan z)$   
Find the value of  $\sin 2x \frac{\partial u}{\partial x} + \sin 2y \frac{\partial u}{\partial y} + \sin 2z \frac{\partial u}{\partial z}$
- d) If  $x^y = y^x$  find  $\frac{dy}{dx}$
- e) Find the percentage error in  $g$  if the percentage errors in  $l$  and  $T$  are both  $-1$  for case of simple pendulum and the relation  $T = \frac{1}{2\pi} \sqrt{\frac{l}{g}}$

**Q.6 Attempt any three questions from the following.** **09**

- a) If  $u = F(e^{x-y}, e^{y-z}, e^{z-x})$  Prove that  $u_x + u_y + u_z = 0$
- b) If  $x = a \cosh u \cos v$ ,  $y = a \sinh u \sin v$  find  $\frac{\partial(x,y)}{\partial(u,v)}$   
(Note: Derivative of  $\cosh x$  is  $\sinh x$ , derivative of  $\sinh x$  is  $\cosh x$  w.r.t.  $x$ )
- c) Find the angle between the normal to the surfaces  $x^2y + z = 3$  and  $x \log z - y^2 + 4 = 0$  at  $(-1, 2, 1)$ .
- d) A particle moves along the curve  $\vec{r} = (t^3 - 4t)i + (t^2 + 4t)j + (8t^2 - 3t^3)k$  where  $t$  denotes time. Show that the magnitudes of acceleration along the tangent and normal at  $t = 2$  are 16 and  $2\sqrt{73}$  respectively.
- e) Prove that  $\nabla \frac{1}{r^3} = \frac{-3\vec{r}}{r^5}$

**Q.7 Attempt any two questions from the following.** **10**

- a) If  $u = \sin^{-1} \left[ \frac{x^{1/4} + y^{1/4}}{x^{1/5} + y^{1/5}} \right]$  then find the values of  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$  and  $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$
- b) Find the stationary value of  $xy(1 - x - y)$
- c) Prove that  $\vec{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$  is irrotational. Find the function  $\phi$  such that  $\vec{F} = \nabla \phi$ .

**Seat  
No.**

## Max. Marks: 70

- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks.
- 4) Use of Non-programable calculator is allowed.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives.**

14

- 1) If  $g(x, y, z) = 0$  then the value of  $\frac{\partial z}{\partial x} = \underline{\hspace{2cm}}$ .

a)  $\frac{g_x}{g_z}$                       b)  $\frac{g_z}{g_x}$

c)  $-\frac{g_z}{g_x}$                       d)  $-\frac{g_x}{g_z}$
- 2) If  $u = \sin x, v = \cos y$  then the value of  $\underline{\hspace{2cm}}$ .

a)  $-\sin y \cos x$                       b)  $-\sin x \cos y$

c)  $-\sin x \sin y$                       d)  $-\cos x \cos y$
- 3) The percentage error in the area of a square when an error of 1% is made in measuring its length is  $\underline{\hspace{2cm}}$

a) 1                                  b) 2

c) 3                                  d) 0
- 4) Directional derivative is maximum along  $\underline{\hspace{2cm}}$

a) Any unit vector                      b) Co-ordinate axes

c) Tangent to the surface                      d) Normal to the surface
- 5) If  $y = \frac{x^{n-1}}{x-1}$  then  $y_n = \underline{\hspace{2cm}}$ .

a) 0                                  b)  $n!$

c) 1                                  d)  $(n - 1)!$
- 6) If  $y = \cos^2 x$  then  $y_n = \underline{\hspace{2cm}}$ .

a)  $-2^{n-1} \cos\left(2x + \frac{n\pi}{2}\right)$                       b)  $2^{n-1} \cos\left(2x + \frac{n\pi}{2}\right)$

c)  $2^{n-1} \sin\left(2x + \frac{n\pi}{2}\right)$                       d)  $2^{n+1} \sin\left(\frac{n\pi}{2}\right)$
- 7) If  $L = \lim_{n \rightarrow \infty} x^2 e^{-x}$  then  $L = \underline{\hspace{2cm}}$ .

a) 0                                  b) 1

c) 2                                  d) -2

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| Seat No. |  |
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Set **R**

**F.Y (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – I**

Day & Date: Monday, 13-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Use of non-programable calculator is allowed.  
 3) Figures to right indicate full marks.

**Section – I**

**Q.2 Attempt any Three question from the following.** **09**

- a) Find the nth derivative of  $y = \sin x \cos x \cos 2x$
- b) Verify Cayley Hamilton theorem for  $A$  where  $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{pmatrix}$
- c) Investigate for what value of  $\mu$  and  $\lambda$  the equations.  
 $2x + 3y + 5z = 9$ ,  $7x + 3y - 2z = 8$ ,  $2x + 3y + \lambda z = \mu$  will have  
 (a) no solution, (b) infinite solution, (c) unique solution
- d) Expand  $x^5 - 5x^4 + 6x^3 - 7x^2 + 8x - 9$  in powers of  $(x - 1)$ .
- e) Expand  $\log \sec x$  in powers of  $x$  up to  $x^4$

**Q.3 Attempt any Three question from the following.** **09**

- a) Find the nth derivative of  $y = \frac{x-1}{x+1}$
- b) Prove that  $\tan^{-1} \left( \frac{\sqrt{1+x^2}-1}{x} \right) = \frac{1}{2} \left[ x + \frac{x^3}{3} + \frac{x^5}{5} + \dots \right]$
- c) Find the nth derivative of  $y = e^{-x} \cdot x \cdot \cos x$
- d) Examine the vector for Linear Dependence and Independence  
 $[1, 1, 1]$ ,  $[1, 2, 3]$ ,  $[2, 3, 8]$
- e) Find the rank of the matrix by reducing and it to Normal form  

$$\begin{pmatrix} 3 & 2 & 1 & 4 \\ -1 & 3 & 2 & 2 \\ 2 & 5 & 3 & 6 \\ 5 & 7 & 4 & 10 \end{pmatrix}$$

**Q.4 Attempt any Two questions from the following.** **10**

- a) If  $\cos^{-1} \left( \frac{y}{b} \right) = \log \left( \frac{x}{n} \right)^n$  then prove that  
 $x^2 y_{n+2} + (2n+1)xy_{n+1} + 2n^2 y_n = 0$
- b) Find the Eigen values and Eigen vector for the smallest Eigen value for  

$$A = \begin{pmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{pmatrix}$$
- c) Find the value of  $a, b, c$  if  

$$\lim_{x \rightarrow 0} \frac{x(a + b \cos x) - c \sin x}{x^5} = 1$$

## Section – II

**Q.5 Attempt any three questions from the following.** **09**

- a) Prove that  $\text{curl}(\vec{a} \times \vec{r}) = 2\vec{a}$
- b) Find the directional derivative of  $\phi = x^2y \cos z$  at  $(1, 2, \pi/2)$  in the direction of  $2i + 3j + 2k$ .
- c) If  $u = \log(\tan x + \tan y + \tan z)$   
Find the value of  $\sin 2x \frac{\partial u}{\partial x} + \sin 2y \frac{\partial u}{\partial y} + \sin 2z \frac{\partial u}{\partial z}$
- d) If  $x^y = y^x$  find  $\frac{dy}{dx}$
- e) Find the percentage error in  $g$  if the percentage errors in  $l$  and  $T$  are both  $-1$  for case of simple pendulum and the relation  $T = \frac{1}{2\pi} \sqrt{\frac{l}{g}}$

**Q.6 Attempt any three questions from the following.** **09**

- a) If  $u = F(e^{x-y}, e^{y-z}, e^{z-x})$  Prove that  $u_x + u_y + u_z = 0$
- b) If  $x = a \cosh u \cos v$ ,  $y = a \sinh u \sin v$  find  $\frac{\partial(x,y)}{\partial(u,v)}$   
(Note: Derivative of  $\cosh x$  is  $\sinh x$ , derivative of  $\sinh x$  is  $\cosh x$  w.r.t.  $x$ )
- c) Find the angle between the normal to the surfaces  $x^2y + z = 3$  and  $x \log z - y^2 + 4 = 0$  at  $(-1, 2, 1)$ .
- d) A particle moves along the curve  $\vec{r} = (t^3 - 4t)i + (t^2 + 4t)j + (8t^2 - 3t^3)k$  where  $t$  denotes time. Show that the magnitudes of acceleration along the tangent and normal at  $t = 2$  are 16 and  $2\sqrt{73}$  respectively.
- e) Prove that  $\nabla \frac{1}{r^3} = \frac{-3\vec{r}}{r^5}$

**Q.7 Attempt any two questions from the following.** **10**

- a) If  $u = \sin^{-1} \left[ \frac{x^{1/4} + y^{1/4}}{x^{1/5} + y^{1/5}} \right]$  then find the values of  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$  and  $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$
- b) Find the stationary value of  $xy(1 - x - y)$
- c) Prove that  $\vec{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$  is irrotational. Find the function  $\phi$  such that  $\vec{F} = \nabla \phi$ .



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No.**

## Max. Marks: 70

4) Use of Non-programable calculator is allowed.

Marks: 14

14

If  $a \neq 0$  then the rank of matrix A is where  $A = \begin{pmatrix} a & a & a \\ a & a & a \\ a & a & a \end{pmatrix}$

- a) 2                      b) a  
c) 0                        d) 1

2) If 1, 1, 8 are eigen values and 5, 2,  $K$  are diagonal elements of matrix  $[A]_{3 \times 3}$ , then the value of  $K$  equals \_\_\_\_\_

- a) 0                                          b) 1  
c) 2                                          d) 3

**3)**  $\nabla \times \bar{r} = ?$

- a)  $i + j + k$   
c) 3
- b) 0  
d)  $\sqrt{3}$

4) If  $\bar{a}$  is constant vector and  $\bar{r} = xi + yj + zk$  then  $\text{grad}(\bar{a} \cdot \bar{r}) = \underline{\hspace{2cm}}$ .

- a)  $2\bar{a}$   
c)  $\bar{r}$

5) If  $u = e^{xy^2 z^3}$  then  $\frac{\partial u}{\partial z} = \underline{\hspace{2cm}}$ .

- a)  $xy^2z^3$       b)  $xy^2z^3y^2z^3$   
c)  $xy^2z^33xy^2z^2$       d)  $xy^2z^32xyz^3$

**6)** If  $g(x, y, z) = 0$  then the value of  $\frac{\partial z}{\partial x} = \underline{\hspace{2cm}}$ .

- a)  $\frac{g_x}{g_z}$
- b)  $\frac{g_z}{g_x}$
- c)  $-\frac{g_z}{g_x}$
- d)  $-\frac{g_x}{g_z}$

7) If  $u = \sin x, v = \cos y$  then the value of \_\_\_\_\_.

- a)  $-\sin y \cos x$                       b)  $-\sin x \cos y$   
c)  $-\sin x \sin y$                       d)  $-\cos x \cos y$

- Page 14 of 16

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Set **S**

**F.Y (B. Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – I**

Day & Date: Monday, 13-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Use of non-programable calculator is allowed.  
 3) Figures to right indicate full marks.

**Section – I**

**Q.2 Attempt any Three question from the following.** **09**

- a) Find the nth derivative of  $y = \sin x \cos x \cos 2x$
- b) Verify Cayley Hamilton theorem for  $A$  where  $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{pmatrix}$
- c) Investigate for what value of  $\mu$  and  $\lambda$  the equations.  
 $2x + 3y + 5z = 9$ ,  $7x + 3y - 2z = 8$ ,  $2x + 3y + \lambda z = \mu$  will have  
 (a) no solution, (b) infinite solution, (c) unique solution
- d) Expand  $x^5 - 5x^4 + 6x^3 - 7x^2 + 8x - 9$  in powers of  $(x - 1)$ .
- e) Expand  $\log \sec x$  in powers of  $x$  up to  $x^4$

**Q.3 Attempt any Three question from the following.** **09**

- a) Find the nth derivative of  $y = \frac{x-1}{x+1}$
- b) Prove that  $\tan^{-1} \left( \frac{\sqrt{1+x^2}-1}{x} \right) = \frac{1}{2} \left[ x + \frac{x^3}{3} + \frac{x^5}{5} + \dots \right]$
- c) Find the nth derivative of  $y = e^{-x} \cdot x \cdot \cos x$
- d) Examine the vector for Linear Dependence and Independence  
 $[1, 1, 1]$ ,  $[1, 2, 3]$ ,  $[2, 3, 8]$
- e) Find the rank of the matrix by reducing and it to Normal form  

$$\begin{pmatrix} 3 & 2 & 1 & 4 \\ -1 & 3 & 2 & 2 \\ 2 & 5 & 3 & 6 \\ 5 & 7 & 4 & 10 \end{pmatrix}$$

**Q.4 Attempt any Two questions from the following.** **10**

- a) If  $\cos^{-1} \left( \frac{y}{b} \right) = \log \left( \frac{x}{n} \right)^n$  then prove that  
 $x^2 y_{n+2} + (2n+1)xy_{n+1} + 2n^2 y_n = 0$
- b) Find the Eigen values and Eigen vector for the smallest Eigen value for  
 $A = \begin{pmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{pmatrix}$
- c) Find the value of  $a, b, c$  if  

$$\lim_{x \rightarrow 0} \frac{x(a + b \cos x) - c \sin x}{x^5} = 1$$

## Section – II

**Q.5 Attempt any three questions from the following.** 09

- a) Prove that  $\text{curl}(\vec{a} \times \vec{r}) = 2\vec{a}$
- b) Find the directional derivative of  $\phi = x^2y \cos z$  at  $(1, 2, \pi/2)$  in the direction of  $2i + 3j + 2k$ .
- c) If  $u = \log(\tan x + \tan y + \tan z)$   
Find the value of  $\sin 2x \frac{\partial u}{\partial x} + \sin 2y \frac{\partial u}{\partial y} + \sin 2z \frac{\partial u}{\partial z}$
- d) If  $x^y = y^x$  find  $\frac{dy}{dx}$
- e) Find the percentage error in  $g$  if the percentage errors in  $l$  and  $T$  are both  $-1$  for case of simple pendulum and the relation  $T = \frac{1}{2\pi} \sqrt{\frac{l}{g}}$

**Q.6 Attempt any three questions from the following.** 09

- a) If  $u = F(e^{x-y}, e^{y-z}, e^{z-x})$  Prove that  $u_x + u_y + u_z = 0$
- b) If  $x = a \cosh u \cos v, y = a \sinh u \sin v$  find  $\frac{\partial(x,y)}{\partial(u,v)}$   
(Note: Derivative of  $\cosh x$  is  $\sinh x$ , derivative of  $\sinh x$  is  $\cosh x$  w.r.t.  $x$ )
- c) Find the angle between the normal to the surfaces  $x^2y + z = 3$  and  $x \log z - y^2 + 4 = 0$  at  $(-1, 2, 1)$ .
- d) A particle moves along the curve  $\vec{r} = (t^3 - 4t)i + (t^2 + 4t)j + (8t^2 - 3t^3)k$  where  $t$  denotes time. Show that the magnitudes of acceleration along the tangent and normal at  $t = 2$  are 16 and  $2\sqrt{73}$  respectively.
- e) Prove that  $\nabla \frac{1}{r^3} = \frac{-3\vec{r}}{r^5}$

**Q.7 Attempt any two questions from the following.** 10

- a) If  $u = \sin^{-1} \left[ \frac{x^{1/4} + y^{1/4}}{x^{1/5} + y^{1/5}} \right]$  then find the values of  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$  and  $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$
- b) Find the stationary value of  $xy(1 - x - y)$
- c) Prove that  $\vec{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$  is irrotational. Find the function  $\phi$  such that  $\vec{F} = \nabla \phi$ .

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**Constants:** 1) Avogadro's no.,  $N = 6.02 \times 10^{26}$  / k.mol.

2) Velocity of light,  $c = 3 \times 10^8$  m/sec.

3) Charge of electron,  $e = 1.6 \times 10^{-19} \text{ C}$ .

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Donor type semiconductor is formed by adding impurity of valency  
a) 5  
b) 4  
c) 3  
d) 6
- 2) The atomic radius of BCC lattice is \_\_\_\_\_.  
a)  $\frac{\sqrt{2}}{4}a$   
b)  $\frac{\sqrt{3}}{4}a$   
c)  $a/2$   
d)  $a/4$
- 3) A plane parallel to one of the co-ordinate axes has an intercept of \_\_\_\_\_.  
a) 1  
b) 0  
c)  $\infty$   
d) none of these
- 4) The ultrasonic wave exhibit \_\_\_\_\_.  
a) Negligible diffraction effect  
b) Large diffraction effect  
c) Very long wavelength  
d) Slow speed than sound waves
- 5) Optimum reverberation time for speech is \_\_\_\_\_.  
a) 0.5 to 1 second  
b) 0 to 1 second  
c) 1 to 2 second  
d) Above 5 second
- 6) The Lorentz transformation equation for  $t'$  co-ordinate from  $s$  to  $s'$  \_\_\_\_\_.  
a) 
$$t' = \frac{(t + v \cdot x)}{\sqrt{1 - \frac{v^2}{c^2}}}$$
  
b) 
$$t' = \frac{\left(t - \frac{v \cdot x}{c^2}\right)}{\sqrt{1 - \frac{v^2}{c^2}}}$$
  
c) 
$$t = \frac{(t - v \cdot x)}{\sqrt{1 - \frac{v^2}{c^2}}}$$
  
d) 
$$t' = \frac{\left(t - \frac{v \cdot x}{c^2}\right)}{\sqrt{1 + \frac{v^2}{c^2}}}$$

- 7) Einstein's mass energy relation ( $E = mc^2$ ) shows that \_\_\_\_\_.  
a) mass disappears to reappear as energy  
b) energy disappears to reappear as mass  
c) mass and energy are two different forms of the same entity  
d) all the above statements are correct
- 8) The resolving power of a grating is \_\_\_\_\_.  
a)  $\lambda/d\lambda$   
b)  $d\lambda/\lambda$   
c)  $nNd\lambda$   
d)  $n(n + 1)$
- 9) The specific rotation of a substance is \_\_\_\_\_ concentration of solution.  
a) independent of  
b) directly proportional to  
c) inversely proportional to  
d) none of these
- 10) Stimulated absorption process is represented by equation \_\_\_\_\_.  
a)  $A^* \longrightarrow A + h\gamma$   
b)  $A^* + h\gamma \longrightarrow A + 2h\gamma$   
c)  $A + h\gamma \longrightarrow A^*$   
d)  $A^* + h\gamma \longrightarrow A + h\gamma$
- 11) LASER beam is \_\_\_\_\_.  
a) Highly directional  
b) Extremely bright  
c) Monochromatic  
d) All of these
- 12) The fractional refractive index change ( $\Delta$ ) is given by \_\_\_\_\_.  
a)  $\Delta = n_1 - n_2$   
b)  $\Delta = n_2 - n_1$   
c)  $\Delta = n_1 - n_2/n_1$   
d)  $\Delta = n_2 - n_1/n_1$
- 13) The acceptance cone of fibre is equal to \_\_\_\_\_.  
a) 2 x acceptance angle  
b) 3 x acceptance angle  
c) Acceptance angle  
d) None
- 14) The chirality of armchair CNT is \_\_\_\_\_.  
a) (a, b)  
b) (a, a)  
c) (a, 0)  
d) (0, b)

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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Physics**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any six of the following:** **18**

- a) Classify conductor, insulator and semiconductor on the basis of energy band structure.
- b) Explain with diagrams: Position of Fermi level in  
1) P-type and 2) N-type semiconductors
- c) Define atomic radius and obtain its values for SC and BCC.
- d) State: Properties of ultrasonic waves.
- e) Derive an expression for Length contraction.
- f) Derive the relation  $E = mc^2$
- g) Determine the lattice constant for FCC lead crystal of radius  $1.746\text{\AA}$ . Also find the spacing of  
1) (111) planes 2) (200) planes
- h) The reverberation time of a hall is 1.5 sec and the area of interior surface is  $3340\text{ m}^2$ . If the volume of the hall is  $12000\text{ m}^3$ . Find the absorption coefficient.

**Q.3 Attempt any two of the following:** **10**

- a) What is Hall effect? Derive the relation for Hall voltage ( $V_H$ ) and Hall coefficient ( $R_H$ ).
- b) Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

- c) State and explain the factors affecting the architectural acoustics and their remedies.
- d) 1) Calculate the density of copper. Given that copper has FCC structure, atomic weight 63.24 and lattice constant is  $3.61 \times 10^{-10}\text{m}$ .  
( $N = 6.02 \times 10^{26}/\text{k.mol.}$ )  
2) Copper has an FCC structure with lattice constant  $3.61\text{ \AA}$ . Calculate the radius of copper atom.

## Section – II

## Q.4 Attempt any six.

18

- a) Derive an expression for the resolving power of a plane diffraction grating.

$$\frac{\lambda}{d\lambda} = n.N$$

- b) State and Explain Malus law.  
 c) Explain in brief:  
     1) Population inversion  
     2) Pumping and  
     3) Metastable state  
 d) Write any **five** applications of laser in different fields.  
 e) Describe the principle (TIR) of optical fiber.  
 f) Explain three types of carbon nano tubes (CNTs).  
 g) In an optical fiber the core material has refractive index 1.6 and refractive index of clad material is 1.3. What is the value of critical angle? Also calculate the value of angle of acceptance.  
 h) What is the De Broglie wavelength of an electron that has a momentum of  $4.56 \times 10^{-27} \text{ kg.m/s}$ ? Given  $h = 6.63 \times 10^{-34} \text{ J.s}$

## Q.5 Attempt any two of the following:

10

- a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.  
 b) Explain in detail Davisson-Germer experiment.  
 c) 1) Determine the grating element of a grating if when illuminated with light of wavelength  $4000\text{\AA}$ , the second order spectrum is seen at an angle of  $26^\circ$   
     2) Calculate the specific rotation if the plane of polarization is turned through  $26.4^\circ$  traversing 20 cm. The length of 20% sugar solution.  
 d) Describe He-Ne laser with its construction and working.



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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Physics**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**Constants:** 1) Avogadro's no.,  $N = 6.02 \times 10^{26}$  / k.mol.

2) Velocity of light,  $c = 3 \times 10^8 \text{ m/sec.}$

3) Charge of electron,  $e = 1.6 \times 10^{-19} \text{ C}$ .

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The resolving power of a grating is \_\_\_\_\_.  
a)  $\lambda/d\lambda$   
b)  $d\lambda/\lambda$   
c)  $nNd\lambda$   
d)  $n(n+1)$
- 2) The specific rotation of a substance is \_\_\_\_\_ concentration of solution.  
a) independent of  
b) directly proportional to  
c) inversely proportional to  
d) none of these
- 3) Stimulated absorption process is represented by equation \_\_\_\_\_.  
a)  $A^* \longrightarrow A + h\gamma$   
b)  $A^* + h\gamma \longrightarrow A + 2h\gamma$   
c)  $A + h\gamma \longrightarrow A^*$   
d)  $A^* + h\gamma \longrightarrow A + h\gamma$
- 4) LASER beam is \_\_\_\_\_.  
a) Highly directional  
b) Extremely bright  
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- 5) The fractional refractive index change ( $\Delta$ ) is given by \_\_\_\_\_.  
a)  $\Delta = n_1 - n_2$   
b)  $\Delta = n_2 - n_1$   
c)  $\Delta = n_1 - n_2/n_1$   
d)  $\Delta = n_2 - n_1/n_1$
- 6) The acceptance cone of fibre is equal to \_\_\_\_\_.  
a) 2 x acceptance angle  
b) 3 x acceptance angle  
c) Acceptance angle  
d) None
- 7) The chirality of armchair CNT is \_\_\_\_\_.  
a) (a, b)  
b) (a, a)  
c) (a, 0)  
d) (0, b)
- 8) Donor type semiconductor is formed by adding impurity of valency \_\_\_\_\_.  
a) 5  
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- 9) The atomic radius of BCC lattice is \_\_\_\_\_.  
 a)  $\frac{\sqrt{2}}{4}a$  b)  $\frac{\sqrt{3}}{4}a$   
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- 10) A plane parallel to one of the co-ordinate axes has an intercept of \_\_\_\_\_.  
 a) 1 b) 0  
 c)  $\infty$  d) none of these
- 11) The ultrasonic wave exhibit \_\_\_\_\_.  
 a) Negligible diffraction effect b) Large diffraction effect  
 c) Very long wavelength d) Slow speed than sound waves
- 12) Optimum reverberation time for speech is \_\_\_\_\_.  
 a) 0.5 to 1 second b) 0 to 1 second  
 c) 1 to 2 second d) Above 5 second
- 13) The Lorentz transformation equation for  $t'$  co-ordinate from  $s$  to  $s'$  \_\_\_\_\_.  
 a)  $t' = \frac{(t + v \cdot x)}{\sqrt{1 - \frac{v^2}{c^2}}}$  b)  $t' = \frac{(t - \frac{v \cdot x}{c^2})}{\sqrt{1 - \frac{v^2}{c^2}}}$   
 c)  $t = \frac{(t - v \cdot x)}{\sqrt{1 - \frac{v^2}{c^2}}}$  d)  $t' = \frac{(t - \frac{v \cdot x}{c^2})}{\sqrt{1 + \frac{v^2}{c^2}}}$
- 14) Einstein's mass energy relation ( $E = mc^2$ ) shows that \_\_\_\_\_.  
 a) mass disappears to reappear as energy  
 b) energy disappears to reappear as mass  
 c) mass and energy are two different forms of the same entity  
 d) all the above statements are correct

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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Physics**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any six of the following:** **18**

- a) Classify conductor, insulator and semiconductor on the basis of energy band structure.
- b) Explain with diagrams: Position of Fermi level in
  - 1) P-type and
  - 2) N-type semiconductors
- c) Define atomic radius and obtain its values for SC and BCC.
- d) State: Properties of ultrasonic waves.
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- g) Determine the lattice constant for FCC lead crystal of radius  $1.746\text{\AA}$ . Also find the spacing of
  - 1) (111) planes
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- h) The reverberation time of a hall is 1.5 sec and the area of interior surface is  $3340\text{ m}^2$ . If the volume of the hall is  $12000\text{ m}^3$ . Find the absorption coefficient.

**Q.3 Attempt any two of the following:** **10**

- a) What is Hall effect? Derive the relation for Hall voltage ( $V_H$ ) and Hall coefficient ( $R_H$ ).
- b) Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

- c) State and explain the factors affecting the architectural acoustics and their remedies.
- d)
  - 1) Calculate the density of copper. Given that copper has FCC structure, atomic weight 63.24 and lattice constant is  $3.61 \times 10^{-10}\text{m}$ . ( $N = 6.02 \times 10^{26}/\text{k.mol.}$ )
  - 2) Copper has an FCC structure with lattice constant  $3.61\text{ \AA}$ . Calculate the radius of copper atom.

**Section – II**

**Q.4 Attempt any six.**

**18**

- a) Derive an expression for the resolving power of a plane diffraction grating.

$$\frac{\lambda}{d\lambda} = n.N$$

- b) State and Explain Malus law.  
c) Explain in brief:  
1) Population inversion  
2) Pumping and  
3) Metastable state  
d) Write any **five** applications of laser in different fields.  
e) Describe the principle (TIR) of optical fiber.  
f) Explain three types of carbon nano tubes (CNTs).  
g) In an optical fiber the core material has refractive index 1.6 and refractive index of clad material is 1.3. What is the value of critical angle? Also calculate the value of angle of acceptance.  
h) What is the De Broglie wavelength of an electron that has a momentum of  $4.56 \times 10^{-27} \text{ kg.m/s}$ ? Given  $h = 6.63 \times 10^{-34} \text{ J.s}$

**Q.5 Attempt any two of the following:**

**10**

- a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.  
b) Explain in detail Davisson-Germer experiment.  
c) 1) Determine the grating element of a grating if when illuminated with light of wavelength  $4000\text{\AA}$ , the second order spectrum is seen at an angle of  $26^\circ$   
2) Calculate the specific rotation if the plane of polarization is turned through  $26.4^\circ$  traversing 20 cm. The length of 20% sugar solution.  
d) Describe He-Ne laser with its construction and working.

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Set **R**

**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Physics**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**Constants:** 1) Avogadro's no.,  $N = 6.02 \times 10^{26}$  / k.mol.  
2) Velocity of light,  $c = 3 \times 10^8$  m/sec.  
3) Charge of electron,  $e = 1.6 \times 10^{-19}$  C.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) LASER beam is \_\_\_\_\_.  
a) Highly directional  
b) Extremely bright  
c) Monochromatic  
d) All of these
- 2) The fractional refractive index change ( $\Delta$ ) is given by \_\_\_\_\_.  
a)  $\Delta = n_1 - n_2$   
b)  $\Delta = n_2 - n_1$   
c)  $\Delta = n_1 - n_2/n_1$   
d)  $\Delta = n_2 - n_1/n_1$
- 3) The acceptance cone of fibre is equal to \_\_\_\_\_.  
a) 2 x acceptance angle  
b) 3 x acceptance angle  
c) Acceptance angle  
d) None
- 4) The chirality of armchair CNT is \_\_\_\_\_.  
a) (a, b)  
b) (a, a)  
c) (a, 0)  
d) (0, b)
- 5) Donor type semiconductor is formed by adding impurity of valency \_\_\_\_\_.  
a) 5  
b) 4  
c) 3  
d) 6
- 6) The atomic radius of BCC lattice is \_\_\_\_\_.  
a)  $\frac{\sqrt{2}}{4}a$   
b)  $\frac{\sqrt{3}}{4}a$   
c)  $a/2$   
d)  $a/4$
- 7) A plane parallel to one of the co-ordinate axes has an intercept of \_\_\_\_\_.  
a) 1  
b) 0  
c)  $\infty$   
d) none of these
- 8) The ultrasonic wave exhibit \_\_\_\_\_.  
a) Negligible diffraction effect  
b) Large diffraction effect  
c) Very long wavelength  
d) Slow speed than sound waves



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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Physics**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any six of the following:** **18**

- a) Classify conductor, insulator and semiconductor on the basis of energy band structure.
- b) Explain with diagrams: Position of Fermi level in
  - 1) P-type and
  - 2) N-type semiconductors
- c) Define atomic radius and obtain its values for SC and BCC.
- d) State: Properties of ultrasonic waves.
- e) Derive an expression for Length contraction.
- f) Derive the relation  $E = mc^2$
- g) Determine the lattice constant for FCC lead crystal of radius  $1.746\text{\AA}$ . Also find the spacing of
  - 1) (111) planes
  - 2) (200) planes
- h) The reverberation time of a hall is 1.5 sec and the area of interior surface is  $3340\text{ m}^2$ . If the volume of the hall is  $12000\text{ m}^3$ . Find the absorption coefficient.

**Q.3 Attempt any two of the following:** **10**

- a) What is Hall effect? Derive the relation for Hall voltage ( $V_H$ ) and Hall coefficient ( $R_H$ ).
- b) Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

- c) State and explain the factors affecting the architectural acoustics and their remedies.
- d)
  - 1) Calculate the density of copper. Given that copper has FCC structure, atomic weight 63.24 and lattice constant is  $3.61 \times 10^{-10}\text{ m}$ .  
( $N = 6.02 \times 10^{26}/\text{k.mol.}$ )
  - 2) Copper has an FCC structure with lattice constant  $3.61\text{ \AA}$ . Calculate the radius of copper atom.

## Section – II

## Q.4 Attempt any six.

18

- a) Derive an expression for the resolving power of a plane diffraction grating.

$$\frac{\lambda}{d\lambda} = n.N$$

- b) State and Explain Malus law.  
 c) Explain in brief:  
     1) Population inversion  
     2) Pumping and  
     3) Metastable state  
 d) Write any **five** applications of laser in different fields.  
 e) Describe the principle (TIR) of optical fiber.  
 f) Explain three types of carbon nano tubes (CNTs).  
 g) In an optical fiber the core material has refractive index 1.6 and refractive index of clad material is 1.3. What is the value of critical angle? Also calculate the value of angle of acceptance.  
 h) What is the De Broglie wavelength of an electron that has a momentum of  $4.56 \times 10^{-27} \text{ kg.m/s}$ ? Given  $h = 6.63 \times 10^{-34} \text{ J.s}$

## Q.5 Attempt any two of the following:

10

- a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.  
 b) Explain in detail Davisson-Germer experiment.  
 c) 1) Determine the grating element of a grating if when illuminated with light of wavelength  $4000\text{\AA}$ , the second order spectrum is seen at an angle of  $26^\circ$   
     2) Calculate the specific rotation if the plane of polarization is turned through  $26.4^\circ$  traversing 20 cm. The length of 20% sugar solution.  
 d) Describe He-Ne laser with its construction and working.



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Set **S**

**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Physics**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**Constants:** 1) Avogadro's no.,  $N = 6.02 \times 10^{26}$  / k.mol.  
2) Velocity of light,  $c = 3 \times 10^8$  m/sec.  
3) Charge of electron,  $e = 1.6 \times 10^{-19}$  C.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

1) The Lorentz transformation equation for  $t'$  co-ordinate from  $s$  to  $s'$  \_\_\_\_\_.

a)  $t' = \frac{(t + v \cdot x)}{\sqrt{1 - \frac{v^2}{c^2}}}$

b)  $t' = \frac{(t - \frac{v \cdot x}{c^2})}{\sqrt{1 - \frac{v^2}{c^2}}}$

c)  $t = \frac{(t - v \cdot x)}{\sqrt{1 - \frac{v^2}{c^2}}}$

d)  $t' = \frac{(t - \frac{v \cdot x}{c^2})}{\sqrt{1 + \frac{v^2}{c^2}}}$

2) Einstein's mass energy relation ( $E = mc^2$ ) shows that \_\_\_\_\_.

- a) mass disappears to reappear as energy
- b) energy disappears to reappear as mass
- c) mass and energy are two different forms of the same entity
- d) all the above statements are correct

3) The resolving power of a grating is \_\_\_\_\_.

- a)  $\lambda/d\lambda$
- b)  $d\lambda/\lambda$
- c)  $nNd\lambda$
- d)  $n(n + 1)$

4) The specific rotation of a substance is \_\_\_\_\_ concentration of solution.

- a) independent of
- b) directly proportional to
- c) inversely proportional to
- d) none of these

5) Stimulated absorption process is represented by equation \_\_\_\_\_.

- a)  $A^* \longrightarrow A + h\gamma$
- b)  $A^* + h\gamma \longrightarrow A + 2h\gamma$
- c)  $A + h\gamma \longrightarrow A^*$
- d)  $A^* + h\gamma \longrightarrow A + h\gamma$

6) LASER beam is \_\_\_\_\_.

- a) Highly directional
- b) Extremely bright
- c) Monochromatic
- d) All of these



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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Physics**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any six of the following:**

**18**

- Classify conductor, insulator and semiconductor on the basis of energy band structure.
- Explain with diagrams: Position of Fermi level in
  - P-type and
  - N-type semiconductors
- Define atomic radius and obtain its values for SC and BCC.
- State: Properties of ultrasonic waves.
- Derive an expression for Length contraction.
- Derive the relation  $E = mc^2$
- Determine the lattice constant for FCC lead crystal of radius  $1.746\text{\AA}$ . Also find the spacing of
  - (111) planes
  - (200) planes
- The reverberation time of a hall is 1.5 sec and the area of interior surface is  $3340\text{ m}^2$ . If the volume of the hall is  $12000\text{ m}^3$ . Find the absorption coefficient.

**Q.3 Attempt any two of the following:**

**10**

- What is Hall effect? Derive the relation for Hall voltage ( $V_H$ ) and Hall coefficient ( $R_H$ ).
- Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

- State and explain the factors affecting the architectural acoustics and their remedies.
- Calculate the density of copper. Given that copper has FCC structure, atomic weight 63.24 and lattice constant is  $3.61 \times 10^{-10}\text{ m}$ . ( $N = 6.02 \times 10^{26}/\text{k.mol.}$ )
  - Copper has an FCC structure with lattice constant  $3.61\text{ \AA}$ . Calculate the radius of copper atom.

## Section – II

## Q.4 Attempt any six.

18

- a) Derive an expression for the resolving power of a plane diffraction grating.

$$\frac{\lambda}{d\lambda} = n.N$$

- b) State and Explain Malus law.

- c) Explain in brief:

- 1) Population inversion
- 2) Pumping and
- 3) Metastable state

- d) Write any **five** applications of laser in different fields.

- e) Describe the principle (TIR) of optical fiber.

- f) Explain three types of carbon nano tubes (CNTs).

- g) In an optical fiber the core material has refractive index 1.6 and refractive index of clad material is 1.3. What is the value of critical angle? Also calculate the value of angle of acceptance.

- h) What is the De Broglie wavelength of an electron that has a momentum of  $4.56 \times 10^{-27} \text{ kg.m/s}$ ? Given  $h = 6.63 \times 10^{-34} \text{ J.s}$

## Q.5 Attempt any two of the following:

10

- a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.

- b) Explain in detail Davisson-Germer experiment.

- c)
  - 1) Determine the grating element of a grating if when illuminated with light of wavelength  $4000\text{\AA}$ , the second order spectrum is seen at an angle of  $26^\circ$
  - 2) Calculate the specific rotation if the plane of polarization is turned through  $26.4^\circ$  traversing 20 cm. The length of 20% sugar solution.

- d) Describe He-Ne laser with its construction and working.

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Set **P**

**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Chemistry**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Hardness in water is caused by the presence of:  
a) sodium chloride                      b) sodium carbonate  
c) calcium chloride                      d) potassium nitrate
- 2) Hard water may be softened by passing it through:  
a) limestone                              b) ion-exchange resin  
c) calgon                                      d) rock salt
- 3) A good lubricant should have:  
a) low viscosity index                      b) high viscosity index  
c) low fire point                              d) high volatility
- 4) Capacity of an oil to stick onto the surface of machine parts under conditions of heavy load, is called:  
a) volatility                                  b) oiliness  
c) acid value                                  d) flash point
- 5) During galvanic corrosion, the more noble metals acts as \_\_\_\_\_.  
a) anode                                      b) cathode  
c) anode as well as cathode                      d) corroding metal
- 6) Galvanizing is the process of coating iron with:  
a) Sn                                              b) Zn  
c) Cu                                              d) Ni
- 7) Highest percentage of carbon is present in:  
a) high carbon steel                      b) wrought iron  
c) cast iron                                      d) medium carbon steel
- 8) Glass used extensively for making superior laboratory apparatus is:  
a) soda glass                                  b) potash glass  
c) borosilicate glass                      d) flint glass
- 9) A good fuel should possess:  
a) low calorific value                      b) high ignition temperature  
c) high calorific value                      d) high ash content



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**P**

**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Chemistry**

Day & Date: Wednesday, 15-03-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four.**

**16**

- a) A sample of water on analysis was found to contain the following impurities in mg/lit:

|                                    | <b>Amount</b> | <b>Mo. Wt.</b> |
|------------------------------------|---------------|----------------|
| Ca(HCO <sub>3</sub> ) <sub>2</sub> | 20.15         | 162            |
| Mg(HCO <sub>3</sub> ) <sub>2</sub> | 18.73         | 146            |
| CaSO <sub>4</sub>                  | 17.00         | 136            |
| MgCl <sub>2</sub>                  | 16.5          | 95             |

Calculate the temporary, permanent and total hardness of water in mg/lit.

- b) Define aeration Explain different types of aerators.  
c) Explain Ion exchange process for softening of hard water.  
d) Define following terms  
1) Viscosity  
2) Acid Value  
3) Fire point  
4) Aniline Point  
e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.  
f) Describe cathodic protection in corrosion control.

**Q.3 Attempt any Four**

**12**

- a) Define BOD. How it is determined. Explain its importance.  
b) Explain characteristics of batteries.  
c) Define Lubricant. Explain its functions  
d) 6 gm of an oil sample after saponification with 50 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titer value of 10 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 50 ml. Calculate saponification value of an oil sample.  
e) Explain semisolid lubricants.  
f) Explain prevention of corrosion by galvanizing.

Section – II

**Q.4 Attempt any Four.**

16

- a) Define alloy. Explain purpose of alloying.
- b) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:  
Volume of the gaseous fuel burnt at STP =  $0.11 \text{ m}^3$   
Weight of water used for cooling =  $34.2 \text{ Kg}$   
Weight of steam condensed =  $0.051 \text{ Kg}$   
Temperature of Inlet water =  $25.2^\circ\text{C}$   
Temperature of Outlet water =  $39.5^\circ\text{C}$   
Determine the gross and net calorific values of gaseous fuel.  
(Take latent heat of condensation of steam =  $587 \text{ kcal/kg}$ ).
- c) Explain construction and working of bomb calorimeter.
- d) Explain molding of plastics in to articles by following methods.
  - 1) Compression molding
  - 2) Injection molding
- e) Explain vulcanization of natural rubber. List advantages of vulcanized rubber?
- f) Define TGA. Explain instrumentation of TGA with diagram.

**Q.5 Attempt any Four.**

12

- a) Explain any three types of glass.
- b) Explain the characteristics of good fuels.
- c) Summarize advantages and disadvantages of biodiesel.
- d) Draw neat and labelled block diagram of GLC.
- e) Calculate Degree of polymerization of PVC having molecular weight 18750. (Mol. Wt. of vinyl chloride = 62.5)
- f) Calculate weight of  $\text{Na}_2\text{CO}_3$  required to prepare 0.4 N 500 ml solution. (Mol. Wt. of  $\text{Na}_2\text{CO}_3$  = 106)



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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Chemistry**

Day & Date: Wednesday, 15-03-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Glass used extensively for making superior laboratory apparatus is:

  - a) soda glass
  - b) potash glass
  - c) borosilicate glass
  - d) flint glass
- 2) A good fuel should possess:

  - a) low calorific value
  - b) high ignition temperature
  - c) high calorific value
  - d) high ash content
- 3) The total quantity of heat liberated when unit mass (or volume) of a fuel is burnt completely is called its \_\_\_\_.

  - a) Heat value
  - b) Burning value
  - c) Calorific value
  - d) Combustion value
- 4) GR-S rubber is an example of:

  - a) condensation polymerization
  - b) copolymerization
  - c) cross-linked polymerization
  - d) addition polymerization in which single monomer takes part
- 5) Most commonly used vulcanizing agent is \_\_\_\_.

  - a) graphite
  - b) carbon black
  - c) dry ice
  - d) sulphur
- 6) Which of the following can be used for purification of substances?

  - a) IR spectroscopy
  - b) UV spectroscopy
  - c) Gas chromatography
  - d) Calorimetry
- 7) Which is the electrolyte used in Li-ion battery?

  - a) Lead dioxide
  - b) Lithium-based gel
  - c) Sulfur dioxide
  - d) Cobalt
- 8) Hardness in water is caused by the presence of:

  - a) sodium chloride
  - b) sodium carbonate
  - c) calcium chloride
  - d) potassium nitrate
- 9) Hard water may be softened by passing it through:

  - a) limestone
  - b) ion-exchange resin
  - c) calgon
  - d) rock salt

- 10)** A good lubricant should have:
- |                        |                         |
|------------------------|-------------------------|
| a) low viscosity index | b) high viscosity index |
| c) low fire point      | d) high volatility      |
- 11)** Capacity of an oil to stick onto the surface of machine parts under conditions of heavy load, is called:
- |               |                |
|---------------|----------------|
| a) volatility | b) oiliness    |
| c) acid value | d) flash point |
- 12)** During galvanic corrosion, the more noble metals acts as \_\_\_\_.
- |                             |                    |
|-----------------------------|--------------------|
| a) anode                    | b) cathode         |
| c) anode as well as cathode | d) corroding metal |
- 13)** Galvanizing is the process of coating iron with:
- |       |       |
|-------|-------|
| a) Sn | b) Zn |
| c) Cu | d) Ni |
- 14)** Highest percentage of carbon is present in:
- |                      |                        |
|----------------------|------------------------|
| a) high carbon steel | b) wrought iron        |
| c) cast iron         | d) medium carbon steel |

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**Set Q**

**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Chemistry**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four.**

**16**

- a) A sample of water on analysis was found to contain the following impurities in mg/lit:

|                                    | Amount | Mo. Wt. |
|------------------------------------|--------|---------|
| Ca(HCO <sub>3</sub> ) <sub>2</sub> | 20.15  | 162     |
| Mg(HCO <sub>3</sub> ) <sub>2</sub> | 18.73  | 146     |
| CaSO <sub>4</sub>                  | 17.00  | 136     |
| MgCl <sub>2</sub>                  | 16.5   | 95      |

Calculate the temporary, permanent and total hardness of water in mg/lit.

- b) Define aeration Explain different types of aerators.  
c) Explain Ion exchange process for softening of hard water.  
d) Define following terms  
1) Viscosity  
2) Acid Value  
3) Fire point  
4) Aniline Point  
e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.  
f) Describe cathodic protection in corrosion control.

**Q.3 Attempt any Four**

**12**

- a) Define BOD. How it is determined. Explain its importance.  
b) Explain characteristics of batteries.  
c) Define Lubricant. Explain its functions  
d) 6 gm of an oil sample after saponification with 50 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titer value of 10 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 50 ml. Calculate saponification value of an oil sample.  
e) Explain semisolid lubricants.  
f) Explain prevention of corrosion by galvanizing.

Section – II

**Q.4 Attempt any Four.**

16

- a) Define alloy. Explain purpose of alloying.
- b) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:  
Volume of the gaseous fuel burnt at STP =  $0.11 \text{ m}^3$   
Weight of water used for cooling =  $34.2 \text{ Kg}$   
Weight of steam condensed =  $0.051 \text{ Kg}$   
Temperature of Inlet water =  $25.2^\circ\text{C}$   
Temperature of Outlet water =  $39.5^\circ\text{C}$   
Determine the gross and net calorific values of gaseous fuel.  
(Take latent heat of condensation of steam =  $587 \text{ kcal/kg}$ ).
- c) Explain construction and working of bomb calorimeter.
- d) Explain molding of plastics in to articles by following methods.
  - 1) Compression molding
  - 2) Injection molding
- e) Explain vulcanization of natural rubber. List advantages of vulcanized rubber?
- f) Define TGA. Explain instrumentation of TGA with diagram.

**Q.5 Attempt any Four.**

12

- a) Explain any three types of glass.
- b) Explain the characteristics of good fuels.
- c) Summarize advantages and disadvantages of biodiesel.
- d) Draw neat and labelled block diagram of GLC.
- e) Calculate Degree of polymerization of PVC having molecular weight 18750. (Mol. Wt. of vinyl chloride = 62.5)
- f) Calculate weight of  $\text{Na}_2\text{CO}_3$  required to prepare 0.4 N 500 ml solution. (Mol. Wt. of  $\text{Na}_2\text{CO}_3$  = 106)

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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Chemistry**

Day & Date: Wednesday, 15-03-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) GR-S rubber is an example of:
  - a) condensation polymerization
  - b) copolymerization
  - c) cross-linked polymerization
  - d) addition polymerization in which single monomer takes part
- 2) Most commonly used vulcanizing agent is \_\_\_\_\_.
  - a) graphite
  - b) carbon black
  - c) dry ice
  - d) sulphur
- 3) Which of the following can be used for purification of substances?
  - a) IR spectroscopy
  - b) UV spectroscopy
  - c) Gas chromatography
  - d) Calorimetry
- 4) Which is the electrolyte used in Li-ion battery?
  - a) Lead dioxide
  - b) Lithium-based gel
  - c) Sulfur dioxide
  - d) Cobalt
- 5) Hardness in water is caused by the presence of:
  - a) sodium chloride
  - b) sodium carbonate
  - c) calcium chloride
  - d) potassium nitrate
- 6) Hard water may be softened by passing it through:
  - a) limestone
  - b) ion-exchange resin
  - c) calgon
  - d) rock salt
- 7) A good lubricant should have:
  - a) low viscosity index
  - b) high viscosity index
  - c) low fire point
  - d) high volatility
- 8) Capacity of an oil to stick onto the surface of machine parts under conditions of heavy load, is called:
  - a) volatility
  - b) oiliness
  - c) acid value
  - d) flash point
- 9) During galvanic corrosion, the more noble metals acts as \_\_\_\_\_.
  - a) anode
  - b) cathode
  - c) anode as well as cathode
  - d) corroding metal



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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Chemistry**

Day & Date: Wednesday, 15-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four.**

**16**

- a) A sample of water on analysis was found to contain the following impurities in mg/lit:

|                                    | Amount | Mo. Wt. |
|------------------------------------|--------|---------|
| Ca(HCO <sub>3</sub> ) <sub>2</sub> | 20.15  | 162     |
| Mg(HCO <sub>3</sub> ) <sub>2</sub> | 18.73  | 146     |
| CaSO <sub>4</sub>                  | 17.00  | 136     |
| MgCl <sub>2</sub>                  | 16.5   | 95      |

Calculate the temporary, permanent and total hardness of water in mg/lit.

- b) Define aeration Explain different types of aerators.  
c) Explain Ion exchange process for softening of hard water.  
d) Define following terms  
1) Viscosity  
2) Acid Value  
3) Fire point  
4) Aniline Point  
e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.  
f) Describe cathodic protection in corrosion control.

**Q.3 Attempt any Four**

**12**

- a) Define BOD. How it is determined. Explain its importance.  
b) Explain characteristics of batteries.  
c) Define Lubricant. Explain its functions  
d) 6 gm of an oil sample after saponification with 50 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titer value of 10 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 50 ml. Calculate saponification value of an oil sample.  
e) Explain semisolid lubricants.  
f) Explain prevention of corrosion by galvanizing.

Section – II

**Q.4 Attempt any Four.**

16

- a) Define alloy. Explain purpose of alloying.
- b) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:  
Volume of the gaseous fuel burnt at STP =  $0.11 \text{ m}^3$   
Weight of water used for cooling =  $34.2 \text{ Kg}$   
Weight of steam condensed =  $0.051 \text{ Kg}$   
Temperature of Inlet water =  $25.2^\circ\text{C}$   
Temperature of Outlet water =  $39.5^\circ\text{C}$   
Determine the gross and net calorific values of gaseous fuel.  
(Take latent heat of condensation of steam =  $587 \text{ kcal/kg}$ ).
- c) Explain construction and working of bomb calorimeter.
- d) Explain molding of plastics in to articles by following methods.
  - 1) Compression molding
  - 2) Injection molding
- e) Explain vulcanization of natural rubber. List advantages of vulcanized rubber?
- f) Define TGA. Explain instrumentation of TGA with diagram.

**Q.5 Attempt any Four.**

12

- a) Explain any three types of glass.
- b) Explain the characteristics of good fuels.
- c) Summarize advantages and disadvantages of biodiesel.
- d) Draw neat and labelled block diagram of GLC.
- e) Calculate Degree of polymerization of PVC having molecular weight 18750. (Mol. Wt. of vinyl chloride = 62.5)
- f) Calculate weight of  $\text{Na}_2\text{CO}_3$  required to prepare 0.4 N 500 ml solution. (Mol. Wt. of  $\text{Na}_2\text{CO}_3$  = 106)



## Set

S

## Engineering Chemistry

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

### MCQ/Objective Type Questions

Marks: 14

14

- 1) Galvanizing is the process of coating iron with:  
a) Sn  
b) Zn  
c) Cu  
d) Ni
- 2) Highest percentage of carbon is present in:  
a) high carbon steel  
b) wrought iron  
c) cast iron  
d) medium carbon steel
- 3) Glass used extensively for making superior laboratory apparatus is:  
a) soda glass  
b) potash glass  
c) borosilicate glass  
d) flint glass
- 4) A good fuel should possess:  
a) low calorific value  
b) high ignition temperature  
c) high calorific value  
d) high ash content
- 5) The total quantity of heat liberated when unit mass (or volume) of a fuel is burnt completely is called its \_\_\_\_\_.  
a) Heat value  
b) Burning value  
c) Calorific value  
d) Combustion value
- 6) GR-S rubber is an example of:  
a) condensation polymerization  
b) copolymerization  
c) cross-linked polymerization  
d) addition polymerization in which single monomer takes part
- 7) Most commonly used vulcanizing agent is \_\_\_\_\_.  
a) graphite  
b) carbon black  
c) dry ice  
d) sulphur
- 8) Which of the following can be used for purification of substances?  
a) IR spectroscopy  
b) UV spectroscopy  
c) Gas chromatography  
d) Calorimetry
- 9) Which is the electrolyte used in Li-ion battery?  
a) Lead dioxide  
b) Lithium-based gel  
c) Sulfur dioxide  
d) Cobalt



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**Set S**

**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Chemistry**

Day & Date: Wednesday, 15-03-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Figures to the right indicate full marks.  
2) All questions are compulsory.

**Section – I**

**Q.2 Attempt any Four.**

**16**

- a) A sample of water on analysis was found to contain the following impurities in mg/lit:

|                                    | Amount | Mo. Wt. |
|------------------------------------|--------|---------|
| Ca(HCO <sub>3</sub> ) <sub>2</sub> | 20.15  | 162     |
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| CaSO <sub>4</sub>                  | 17.00  | 136     |
| MgCl <sub>2</sub>                  | 16.5   | 95      |

Calculate the temporary, permanent and total hardness of water in mg/lit.

- b) Define aeration Explain different types of aerators.  
c) Explain Ion exchange process for softening of hard water.  
d) Define following terms  
1) Viscosity  
2) Acid Value  
3) Fire point  
4) Aniline Point  
e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.  
f) Describe cathodic protection in corrosion control.

**Q.3 Attempt any Four**

**12**

- a) Define BOD. How it is determined. Explain its importance.  
b) Explain characteristics of batteries.  
c) Define Lubricant. Explain its functions  
d) 6 gm of an oil sample after saponification with 50 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titer value of 10 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 50 ml. Calculate saponification value of an oil sample.  
e) Explain semisolid lubricants.  
f) Explain prevention of corrosion by galvanizing.

Section – II

**Q.4 Attempt any Four.**

16

- a) Define alloy. Explain purpose of alloying.
- b) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:  
Volume of the gaseous fuel burnt at STP =  $0.11 \text{ m}^3$   
Weight of water used for cooling =  $34.2 \text{ Kg}$   
Weight of steam condensed =  $0.051 \text{ Kg}$   
Temperature of Inlet water =  $25.2^\circ\text{C}$   
Temperature of Outlet water =  $39.5^\circ\text{C}$   
Determine the gross and net calorific values of gaseous fuel.  
(Take latent heat of condensation of steam =  $587 \text{ kcal/kg}$ ).
- c) Explain construction and working of bomb calorimeter.
- d) Explain molding of plastics in to articles by following methods.
  - 1) Compression molding
  - 2) Injection molding
- e) Explain vulcanization of natural rubber. List advantages of vulcanized rubber?
- f) Define TGA. Explain instrumentation of TGA with diagram.

**Q.5 Attempt any Four.**

12

- a) Explain any three types of glass.
- b) Explain the characteristics of good fuels.
- c) Summarize advantages and disadvantages of biodiesel.
- d) Draw neat and labelled block diagram of GLC.
- e) Calculate Degree of polymerization of PVC having molecular weight 18750. (Mol. Wt. of vinyl chloride = 62.5)
- f) Calculate weight of  $\text{Na}_2\text{CO}_3$  required to prepare 0.4 N 500 ml solution. (Mol. Wt. of  $\text{Na}_2\text{CO}_3$  = 106)

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**Set****P**

**F.Y. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Basics of Civil and Mechanical Engineering**

Day & Date: Friday, 17-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Following is not a branch of civil engineering
  - a) Transportation Engineering
  - b) Data Structure
  - c) Structural Engineering
  - d) Hydraulic Engineering
- 2) What is rain water harvesting?
  - a) Collection and storage of used water
  - b) Collection and storage of Rainwater
  - c) Distribution of water
  - d) None of the above
- 3) Which of the following is not the purpose of a green building?
  - a) To reduce use of water
  - b) To minimize damage of the environment
  - c) Re-use of waste materials
  - d) None of the above
- 4) The portion of the building between Ground level and Ground floor is called
  - a) Foundation
  - b) Plinth
  - c) Wall
  - d) Lintel
- 5) Which of the following is a classification based on the nature of the field survey?
  - a) Topographic surveying
  - b) Mine surveying
  - c) Military surveying
  - d) Chain surveying
- 6) D.P.C (Damp Proof Course) is mainly laid on
  - a) Plinth
  - b) Floor
  - c) Foundation
  - d) Footing
- 7) Which of the following is the first principle of surveying?
  - a) Whole to whole
  - b) Whole to part
  - c) Part to part
  - d) Part to whole

- 8) The devices, like compressors and pumps which require energy input for their operation are called \_\_\_\_\_.  
a) Power absorbing devices      b) Power producing devices  
c) Power transferring devices      d) Power fulfilling devices
- 9) Which of the following is a general-purpose machine tools  
a) Milling      b) Lathe  
c) Drilling      d) Cutting
- 10) A welding process definitely needs following input  
a) Heat      b) Pressure  
c) Filler material      d) Coolant
- 11) The pulley fixed on the shaft of a prime mover known as  
a) Driver pulley      b) Driven pulley  
c) Jockey pulley      d) Cone pulley
- 12) Gears used to connect two non-parallel and intersecting shafts at right angles to each other.  
a) Spiral gears      b) Spur gears  
c) Bevel gears      d) Helical gears
- 13) During a cycle, the heat transfer are given by: 120kJ, -60kJ, -48kJ, and 12kJ then the net work transfer the cycle is  
a) 60000 Nm      b) 24000 Nm  
c) 12000 Nm      d) 4400 Nm
- 14) A system comprising of a single phase, is known as  
a) Open system      b) Closed system  
c) Heterogeneous system      d) Homogeneous system

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Set **P**

**F.Y. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Basics of Civil and Mechanical Engineering**

Day & Date: Friday, 17-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 2 & Q. 4 are short answer type questions.  
 2) Q. 3 and Q. 5 are long answer type questions.  
 3) Neat diagram must be drawn whenever necessary.  
 4) Use of log tables and non-programmable single memory calculator is Allowed.

**Section – I**

- Q.2 Attempt any Five. 15**
- Write the Significance of any one subdomains of Civil engineering.
  - Enlist various stages involved in the water treatment plant.
  - Draw Typical Functional Cross Section of Road and also give label to each part of cross section.
  - Write short note on rain water harvesting.
  - Explain the concept of green building.
  - Write any three applications of GIS.
  - Write note on fire safety measures of building.
- Q.3 Attempt any one out of (a) and (b) and solve any two out of (c) to (f) 13**
- Differentiate between Load bearing and Framed structure. **05**
  - Explain various stages involved in effluent treatment plant. **05**
  - Write note on classification of Road. **04**
  - Write note on classification of surveying. **04**
  - Explain various application of Remote sensing. **04**
  - Differentiate between Plane Surveying and Geodetic Surveying. **04**

**Section – II**

- Q.4 Attempt any Five. 15**
- Distinguish between Centrifugal pump and Reciprocating pump.
  - Write a note on construction of a Pelton wheel with its diagram.
  - What is Brazing process? Explain with neat sketch.
  - State and explain the first law of thermodynamics in case of an open system.
  - Write short notes on**
    - Compound gear train
    - Simple gear train
  - Write a note on**
    - Zeroth law of thermodynamic
    - Open and closed systems
  - Derive an expression for velocity of fluid at the exit of nozzle, by applying SFEE.

**Q.5 Attempt any one out of (a) and (b) and solve any two out of (c) to (f)** **13**

- a)** Two parallel shafts, which have center distance between them 8 m. They are connected by crossed belt drive. The diameter of driver pulley is 800 mm and diameter of driven pulley is 600 mm. The direction of rotation of driven is need to be reversed by changing over an open belt drive. Calculate the length of both open and crossed belt drive and state can same belt be applied in changed arrangement? If not, then what will be the solution to fix the belt in open belt drive? **05**

- b)** Describe Lathe Machine with its block diagram. **05**

- c)** A cycle comprises three processes. The energy transfers in each are tabulated below. Complete the table. **04**

| Process | Q(KJ) | W (KJ) | $\Delta U$ (KJ) |
|---------|-------|--------|-----------------|
| 1-2     | +80   | +30    | ---             |
| 2-3     | ---   | -50    | +20             |
| 3-1     | +50   | ---    | ---             |

- d)** Explain with neat sketch working of Kaplan turbine. **04**

- e)** Derive an expression for length of belt for open belt drive. **04**

- f)** Sketch and describe in brief pillar drilling machine. **04**



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**F.Y. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Basics of Civil and Mechanical Engineering**

Day & Date: Friday, 17-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The devices, like compressors and pumps which require energy input for their operation are called \_\_\_\_\_.  
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- 3) A welding process definitely needs following input  
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- 4) The pulley fixed on the shaft of a prime mover known as  
 a) Driver pulley      b) Driven pulley  
 c) Jockey pulley      d) Cone pulley
- 5) Gears used to connect two non-parallel and intersecting shafts at right angles to each other.  
 a) Spiral gears      b) Spur gears  
 c) Bevel gears      d) Helical gears
- 6) During a cycle, the heat transfer are given by: 120kJ, -60kJ, -48kJ, and 12kJ then the net work transfer the cycle is  
 a) 60000 Nm      b) 24000 Nm  
 c) 12000 Nm      d) 4400 Nm
- 7) A system comprising of a single phase, is known as  
 a) Open system      b) Closed system  
 c) Heterogeneous system      d) Homogeneous system
- 8) Following is not a branch of civil engineering  
 a) Transportation Engineering      b) Data Structure  
 c) Structural Engineering      d) Hydraulic Engineering

- 9) What is rain water harvesting?
- a) Collection and storage of used water
  - b) Collection and storage of Rainwater
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- 10) Which of the following is not the purpose of a green building?
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- 11) The portion of the building between Ground level and Ground floor is called
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  - c) Wall
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Set **Q**

**F.Y. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Basics of Civil and Mechanical Engineering**

Day & Date: Friday, 17-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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**Section – I**

**Q.2 Attempt any Five.** **15**

- a) Write the Significance of any one subdomains of Civil engineering.
- b) Enlist various stages involved in the water treatment plant.
- c) Draw Typical Functional Cross Section of Road and also give label to each part of cross section.
- d) Write short note on rain water harvesting.
- e) Explain the concept of green building.
- f) Write any three applications of GIS.
- g) Write note on fire safety measures of building.

**Q.3 Attempt any one out of (a) and (b) and solve any two out of (c) to (f)** **13**

- a) Differentiate between Load bearing and Framed structure. **05**
- b) Explain various stages involved in effluent treatment plant. **05**
- c) Write note on classification of Road. **04**
- d) Write note on classification of surveying. **04**
- e) Explain various application of Remote sensing. **04**
- f) Differentiate between Plane Surveying and Geodetic Surveying. **04**

**Section – II**

**Q.4 Attempt any Five.** **15**

- a) Distinguish between Centrifugal pump and Reciprocating pump.
- b) Write a note on construction of a Pelton wheel with its diagram.
- c) What is Brazing process? Explain with neat sketch.
- d) State and explain the first law of thermodynamics in case of an open system.
- e) **Write short notes on**
  - 1) Compound gear train
  - 2) Simple gear train
- f) **Write a note on**
  - 1) Zeroth law of thermodynamic
  - 2) Open and closed systems
- g) Derive an expression for velocity of fluid at the exit of nozzle, by applying SFEE.

**Q.5 Attempt any one out of (a) and (b) and solve any two out of (c) to (f)** **13**

- a)** Two parallel shafts, which have center distance between them 8 m. They are connected by crossed belt drive. The diameter of driver pulley is 800 mm and diameter of driven pulley is 600 mm. The direction of rotation of driven is need to be reversed by changing over an open belt drive. Calculate the length of both open and crossed belt drive and state can same belt be applied in changed arrangement? If not, then what will be the solution to fix the belt in open belt drive? **05**

- b)** Describe Lathe Machine with its block diagram. **05**

- c)** A cycle comprises three processes. The energy transfers in each are tabulated below. Complete the table. **04**

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- d)** Explain with neat sketch working of Kaplan turbine. **04**

- e)** Derive an expression for length of belt for open belt drive. **04**

- f)** Sketch and describe in brief pillar drilling machine. **04**

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**F.Y. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Basics of Civil and Mechanical Engineering**

Day & Date: Friday, 17-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The pulley fixed on the shaft of a prime mover known as
  - a) Driver pulley
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  - c) Jockey pulley
  - d) Cone pulley
- 2) Gears used to connect two non-parallel and intersecting shafts at right angles to each other.
  - a) Spiral gears
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  - b) Plinth
  - c) Wall
  - d) Lintel

- 9) Which of the following is a classification based on the nature of the field survey?
- a) Topographic surveying
  - b) Mine surveying
  - c) Military surveying
  - d) Chain surveying
- 10) D.P.C (Damp Proof Course) is mainly laid on
- a) Plinth
  - b) Floor
  - c) Foundation
  - d) Footing
- 11) Which of the following is the first principle of surveying?
- a) Whole to whole
  - b) Whole to part
  - c) Part to part
  - d) Part to whole
- 12) The devices, like compressors and pumps which require energy input for their operation are called \_\_\_\_\_.
- a) Power absorbing devices
  - b) Power producing devices
  - c) Power transferring devices
  - d) Power fulfilling devices
- 13) Which of the following is a general-purpose machine tools
- a) Milling
  - b) Lathe
  - c) Drilling
  - d) Cutting
- 14) A welding process definitely needs following input
- a) Heat
  - b) Pressure
  - c) Filler material
  - d) Coolant

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Set **R**

**F.Y. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Basics of Civil and Mechanical Engineering**

Day & Date: Friday, 17-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) Q. 2 & Q. 4 are short answer type questions.  
 2) Q. 3 and Q. 5 are long answer type questions.  
 3) Neat diagram must be drawn whenever necessary.  
 4) Use of log tables and non-programmable single memory calculator is Allowed.

**Section – I**

- Q.2 Attempt any Five.** **15**
- Write the Significance of any one subdomains of Civil engineering.
  - Enlist various stages involved in the water treatment plant.
  - Draw Typical Functional Cross Section of Road and also give label to each part of cross section.
  - Write short note on rain water harvesting.
  - Explain the concept of green building.
  - Write any three applications of GIS.
  - Write note on fire safety measures of building.
- Q.3 Attempt any one out of (a) and (b) and solve any two out of (c) to (f)** **13**
- Differentiate between Load bearing and Framed structure. **05**
  - Explain various stages involved in effluent treatment plant. **05**
  - Write note on classification of Road. **04**
  - Write note on classification of surveying. **04**
  - Explain various application of Remote sensing. **04**
  - Differentiate between Plane Surveying and Geodetic Surveying. **04**

**Section – II**

- Q.4 Attempt any Five.** **15**
- Distinguish between Centrifugal pump and Reciprocating pump.
  - Write a note on construction of a Pelton wheel with its diagram.
  - What is Brazing process? Explain with neat sketch.
  - State and explain the first law of thermodynamics in case of an open system.
  - Write short notes on**
    - Compound gear train
    - Simple gear train
  - Write a note on**
    - Zeroth law of thermodynamic
    - Open and closed systems
  - Derive an expression for velocity of fluid at the exit of nozzle, by applying SFEE.

**Q.5 Attempt any one out of (a) and (b) and solve any two out of (c) to (f)** **13**

- a)** Two parallel shafts, which have center distance between them 8 m. They are connected by crossed belt drive. The diameter of driver pulley is 800 mm and diameter of driven pulley is 600 mm. The direction of rotation of driven is need to be reversed by changing over an open belt drive. Calculate the length of both open and crossed belt drive and state can same belt be applied in changed arrangement? If not, then what will be the solution to fix the belt in open belt drive? **05**

- b)** Describe Lathe Machine with its block diagram. **05**

- c)** A cycle comprises three processes. The energy transfers in each are tabulated below. Complete the table. **04**

| Process | Q(KJ) | W (KJ) | $\Delta U$ (KJ) |
|---------|-------|--------|-----------------|
| 1-2     | +80   | +30    | ---             |
| 2-3     | ---   | -50    | +20             |
| 3-1     | +50   | ---    | ---             |

- d)** Explain with neat sketch working of Kaplan turbine. **04**

- e)** Derive an expression for length of belt for open belt drive. **04**

- f)** Sketch and describe in brief pillar drilling machine. **04**



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| Set | S |
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**F.Y. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Basics of Civil and Mechanical Engineering**

Day & Date: Friday, 17-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) D.P.C (Damp Proof Course) is mainly laid on
  - a) Plinth
  - b) Floor
  - c) Foundation
  - d) Footing
- 2) Which of the following is the first principle of surveying?
  - a) Whole to whole
  - b) Whole to part
  - c) Part to part
  - d) Part to whole
- 3) The devices, like compressors and pumps which require energy input for their operation are called \_\_\_\_\_.
  - a) Power absorbing devices
  - b) Power producing devices
  - c) Power transferring devices
  - d) Power fulfilling devices
- 4) Which of the following is a general-purpose machine tools
  - a) Milling
  - b) Lathe
  - c) Drilling
  - d) Cutting
- 5) A welding process definitely needs following input
  - a) Heat
  - b) Pressure
  - c) Filler material
  - d) Coolant
- 6) The pulley fixed on the shaft of a prime mover known as
  - a) Driver pulley
  - b) Driven pulley
  - c) Jockey pulley
  - d) Cone pulley
- 7) Gears used to connect two non-parallel and intersecting shafts at right angles to each other.
  - a) Spiral gears
  - b) Spur gears
  - c) Bevel gears
  - d) Helical gears
- 8) During a cycle, the heat transfer are given by: 120kJ, -60kJ, -48kJ, and 12kJ then the net work transfer the cycle is
  - a) 60000 Nm
  - b) 24000 Nm
  - c) 12000 Nm
  - d) 4400 Nm
- 9) A system comprising of a single phase, is known as
  - a) Open system
  - b) Closed system
  - c) Heterogeneous system
  - d) Homogeneous system

- 10)** Following is not a branch of civil engineering
- a) Transportation Engineering      b) Data Structure
  - c) Structural Engineering          d) Hydraulic Engineering
- 11)** What is rain water harvesting?
- a) Collection and storage of used water
  - b) Collection and storage of Rainwater
  - c) Distribution of water
  - d) None of the above
- 12)** Which of the following is not the purpose of a green building?
- a) To reduce use of water
  - b) To minimize damage of the environment
  - c) Re-use of waste materials
  - d) None of the above
- 13)** The portion of the building between Ground level and Ground floor is called
- a) Foundation                              b) Plinth
  - c) Wall                                        d) Lintel
- 14)** Which of the following is a classification based on the nature of the field survey?
- a) Topographic surveying              b) Mine surveying
  - c) Military surveying                    d) Chain surveying

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Set **S**

**F.Y. (B.Tech) (Sem-I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Basics of Civil and Mechanical Engineering**

Day & Date: Friday, 17-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) Q. 2 & Q. 4 are short answer type questions.  
 2) Q. 3 and Q. 5 are long answer type questions.  
 3) Neat diagram must be drawn whenever necessary.  
 4) Use of log tables and non-programmable single memory calculator is Allowed.

**Section – I**

**Q.2 Attempt any Five.** **15**

- a) Write the Significance of any one subdomains of Civil engineering.
- b) Enlist various stages involved in the water treatment plant.
- c) Draw Typical Functional Cross Section of Road and also give label to each part of cross section.
- d) Write short note on rain water harvesting.
- e) Explain the concept of green building.
- f) Write any three applications of GIS.
- g) Write note on fire safety measures of building.

**Q.3 Attempt any one out of (a) and (b) and solve any two out of (c) to (f)** **13**

- a) Differentiate between Load bearing and Framed structure. **05**
- b) Explain various stages involved in effluent treatment plant. **05**
- c) Write note on classification of Road. **04**
- d) Write note on classification of surveying. **04**
- e) Explain various application of Remote sensing. **04**
- f) Differentiate between Plane Surveying and Geodetic Surveying. **04**

**Section – II**

**Q.4 Attempt any Five.** **15**

- a) Distinguish between Centrifugal pump and Reciprocating pump.
- b) Write a note on construction of a Pelton wheel with its diagram.
- c) What is Brazing process? Explain with neat sketch.
- d) State and explain the first law of thermodynamics in case of an open system.
- e) **Write short notes on**
  - 1) Compound gear train
  - 2) Simple gear train
- f) **Write a note on**
  - 1) Zeroth law of thermodynamic
  - 2) Open and closed systems
- g) Derive an expression for velocity of fluid at the exit of nozzle, by applying SFEE.

**Q.5 Attempt any one out of (a) and (b) and solve any two out of (c) to (f)** **13**

- a)** Two parallel shafts, which have center distance between them 8 m. They are connected by crossed belt drive. The diameter of driver pulley is 800 mm and diameter of driven pulley is 600 mm. The direction of rotation of driven is need to be reversed by changing over an open belt drive. Calculate the length of both open and crossed belt drive and state can same belt be applied in changed arrangement? If not, then what will be the solution to fix the belt in open belt drive? **05**

- b)** Describe Lathe Machine with its block diagram. **05**

- c)** A cycle comprises three processes. The energy transfers in each are tabulated below. Complete the table. **04**

| Process | Q(KJ) | W (KJ) | $\Delta U$ (KJ) |
|---------|-------|--------|-----------------|
| 1-2     | +80   | +30    | ---             |
| 2-3     | ---   | -50    | +20             |
| 3-1     | +50   | ---    | ---             |

- d)** Explain with neat sketch working of Kaplan turbine. **04**

- e)** Derive an expression for length of belt for open belt drive. **04**

- f)** Sketch and describe in brief pillar drilling machine. **04**

**Seat  
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## Max. Marks: 70

- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

## 14

- 1) Ideal condition(s) assumed in engineering mechanics is (are) \_\_\_\_\_.  
a) Body is rigid                      b) Body is continuum  
c) both a and b                      d) Body is plastic
- 2) Capital letters used to indicate spaces between forces is termed as \_\_\_\_\_.  
a) Newton's Letters                  b) Varignon's notations  
c) Bow's notations                  d) All of these
- 3) A force can be resolved in to \_\_\_\_\_.  
a) n components                      b) a force and couple moment  
c) both a and b                      d) only two components
- 4) If a given truss satisfies mathematical condition  $m = 2j - 3$  then the truss is \_\_\_\_\_.  
a) redundant                          b) deficient  
c) imperfect                          d) perfect
- 5) To start the analysis of truss by method of joints the number of unknown must not be more than \_\_\_\_\_.  
a) two                                    b) three  
c) either two or three                d) four
- 6) A point at which whole area of lamina is supposed to be concentrated is called as \_\_\_\_\_.  
a) centre of gravity                  b) centroid  
c) centre of mass                      d) none of these
- 7) If axis of symmetry exist then it passes through the \_\_\_\_\_.  
a) centre                                 b) base  
c) top of web                          d) side of flange
- 8) If a particle requires t seconds to reach maximum height during upward motion from a certain position then how much time it will take to reach the same point in its downward motion \_\_\_\_\_.  
a) t                                         b) t/2  
c) 2t                                        d) 9.81 t

- 9) A straight line s-t curve passing through the origin represents \_\_\_\_\_.  
a) Uniform Velocity  
b) Uniform acceleration  
c) Both a and b  
d) Retardation
- 10) If a car travelling at 70 kmph halts due to application of brakes after 5.14 sec then the rate of reduction of velocity with time is \_\_\_\_\_.  
a)  $2.98 \text{ m/s}^2$   
b)  $2.89 \text{ m/s}^2$   
c)  $3.78 \text{ m/s}^2$   
d)  $4.89 \text{ m/s}^2$
- 11) Inertia force during retardation acts in \_\_\_\_\_.  
a) Same direction of motion  
b) Opposite direction of motion  
c) Perpendicular to direction of motion  
d) Both a and b
- 12) 100 rpm is equivalent to \_\_\_\_\_.  
a) 10.467 rad/sec  
b) 628 rad/sec  
c) 1.667 rad/sec  
d) 955.414 rad/sec
- 13) Potential energy of body at height h from ground is 2 unit then its kinetic energy when it reaches at ground is \_\_\_\_\_.  
a) 16 unit  
b) 4 unit  
c) 2 unit  
d) 0
- 14) Centroidal rotation is rotation of body about \_\_\_\_\_.  
a) Axis parallel to its centroidal axis  
b) axis perpendicular to its plane of rotation and passing through its centre  
c) both a and b  
d) none of these

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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mechanics**

Day & Date: Monday, 20-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

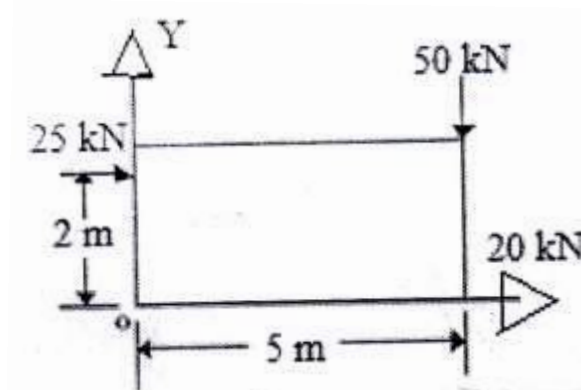
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four)**

12

- State and explain Newton's laws of motion.
- Enlist any three systems of forces.
- Determine resultant and its direction of force system acting on body as shown below.

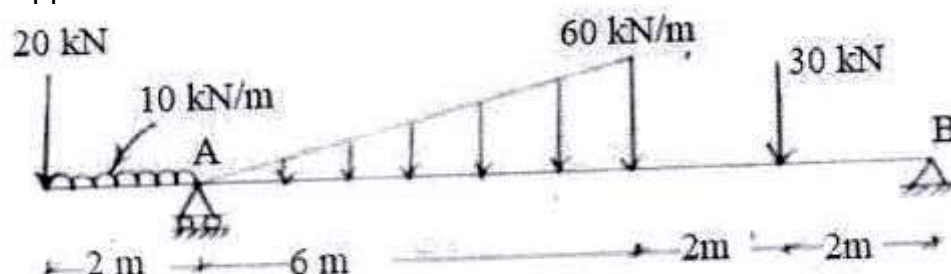


- A block of 200 N is resting on rough horizontal surface. To just slide the block a pull of 50 N is required. Determine coefficient of friction between surface of body and plane.
- Define centroid and moment of inertia.
- What is meant by couple moment? Enlist characteristics of couple moment.

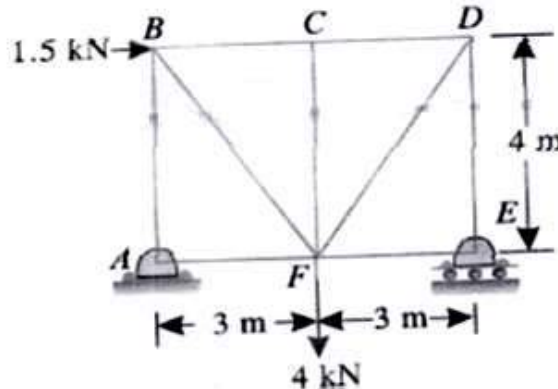
**Q.3 Answer the following question. (Any Two)**

16

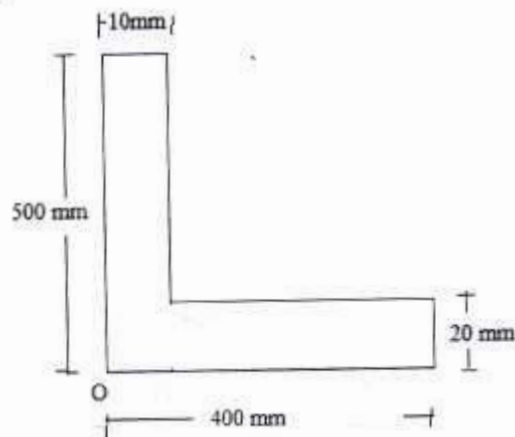
- Determine the support reactions for the beam which is loaded and supported as shown below.



- b) Determine forces and their nature in all the members of a truss which is loaded and supported as shown below.



- c) Locate centroid with respect to reference point O and determine the moment of inertia about polar axis for the L section as shown below



### Section – II

#### Q.4 Answer the following question. (Any Four)

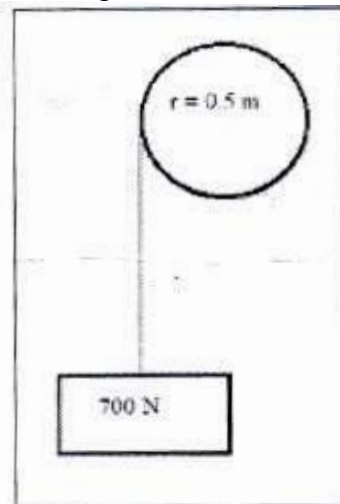
12

- Derive equations of linear motion with uniform acceleration.
- Define the following.
  - Angular velocity
  - Angular acceleration
  - Angular displacement
- A motorist is traveling at speed of 80 kmph suddenly applies brakes and halts after skidding 60 m if rate of retardation is  $4.12 \text{ m/s}^2$ . Determine coefficient of friction between road and tyre. Use D'Alembert's principle.
- State and derive work energy equation.
- Initial velocity of two balls moving towards each other are 10 m/s and 4 m/s respectively and their velocities after collision are 4 m/s and 10 m/s respectively. Determine coefficient of restitution.
- State and explain types of vibration.

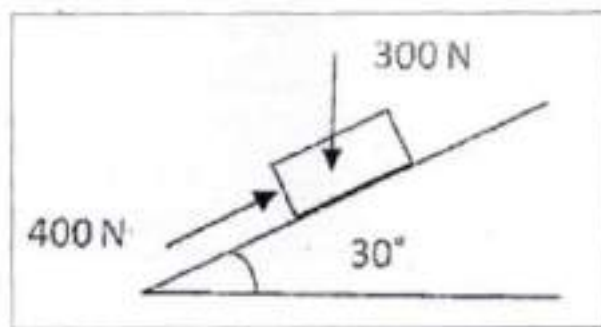


**Q.5 Answer the following question. (Any Two)**

- a) Angular acceleration of flywheel is given by  $\alpha = 12 - t$  where,  $\alpha$  is in radians and  $t$  is in seconds. If the angular velocity of flywheel is 60 rad/sec at the end of 4 seconds. Determine,
- 1) Angular velocity at the end of 6 seconds.
  - 2) Angular acceleration in 13<sup>th</sup> second
  - 3) Number of revolutions at the end of 6 seconds
- b) A pulley of weight 500 N has a radius of 0.5 m. A block weighing 700 N is suspended by a tight rope wound round the pulley the other end being attached to the pulley as shown in below in fig below. Determine the resulting acceleration of the weight and the tension in the rope.



- c) A body weighing 300 N is pushed up a 30° plane by a 400 N force acting parallel to the plane as shown in below. If the initial velocity of the body is 1.5 m/sec. and coefficient of kinetic friction is = 0.2, what velocity will the body have after moving 6 m? Use work energy method.



**Seat  
No.**

Max. Marks: 70

- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 6 of 20

- 8) Ideal condition(s) assumed in engineering mechanics is (are) \_\_\_\_\_.  
a) Body is rigid                      b) Body is continuum  
c) both a and b                      d) Body is plastic
- 9) Capital letters used to indicate spaces between forces is termed as \_\_\_\_\_.  
a) Newton's Letters                  b) Varignon's notations  
c) Bow's notations                  d) All of these
- 10) A force can be resolved in to \_\_\_\_\_.  
a) n components                    b) a force and couple moment  
c) both a and b                    d) only two components
- 11) If a given truss satisfies mathematical condition  $m = 2j - 3$  then the truss is \_\_\_\_\_.  
a) redundant                         b) deficient  
c) imperfect                         d) perfect
- 12) To start the analysis of truss by method of joints the number of unknown must not be more than \_\_\_\_\_.  
a) two                                    b) three  
c) either two or three               d) four
- 13) A point at which whole area of lamina is supposed to be concentrated is called as \_\_\_\_\_.  
a) centre of gravity                  b) centroid  
c) centre of mass                    d) none of these
- 14) If axis of symmetry exist then it passes through the \_\_\_\_\_.  
a) centre                                b) base  
c) top of web                         d) side of flange

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Set **Q**

**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mechanics**

Day & Date: Monday, 20-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

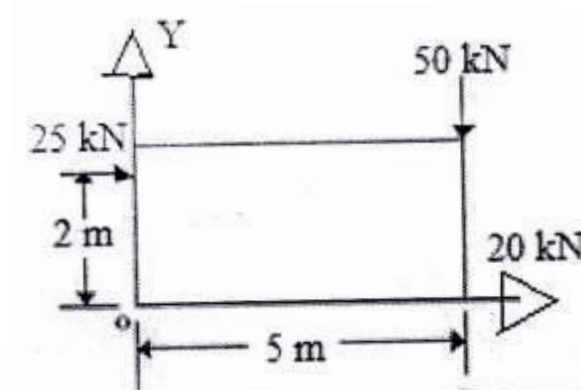
**Instructions:** 1) All questions are compulsory.  
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**Section – I**

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- Enlist any three systems of forces.
- Determine resultant and its direction of force system acting on body as shown below.

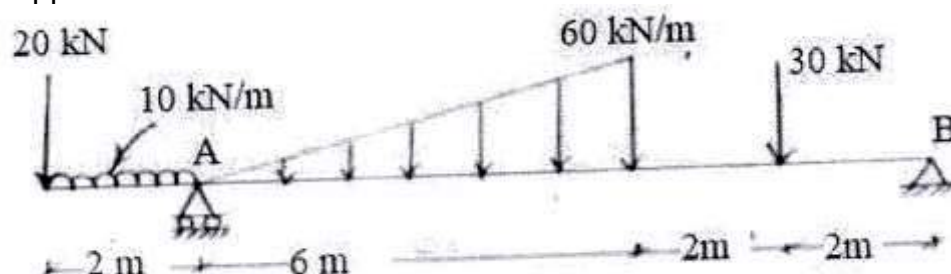


- A block of 200 N is resting on rough horizontal surface. To just slide the block a pull of 50 N is required. Determine coefficient of friction between surface of body and plane.
- Define centroid and moment of inertia.
- What is mean by couple moment? Enlist characteristics of couple moment.

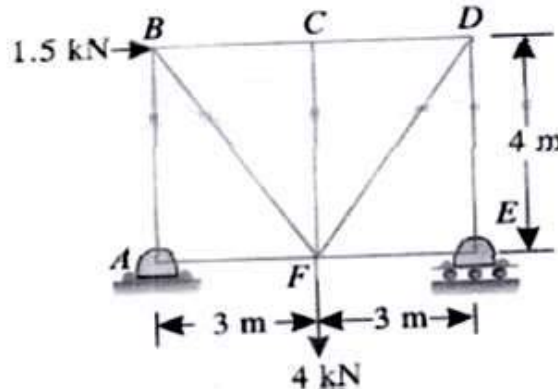
**Q.3 Answer the following question. (Any Two)**

16

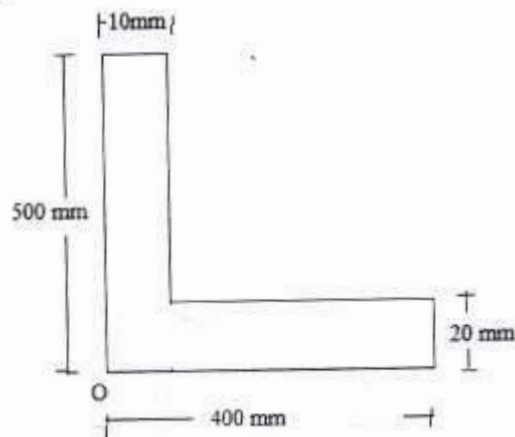
- Determine the support reactions for the beam which is loaded and supported as shown below.



- b) Determine forces and their nature in all the members of a truss which is loaded and supported as shown below.



- c) Locate centroid with respect to reference point O and determine the moment of inertia about polar axis for the L section as shown below



### Section – II

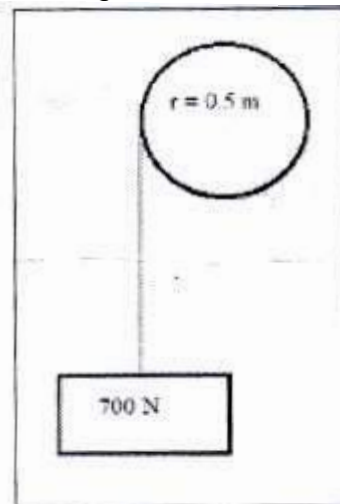
#### Q.4 Answer the following question. (Any Four)

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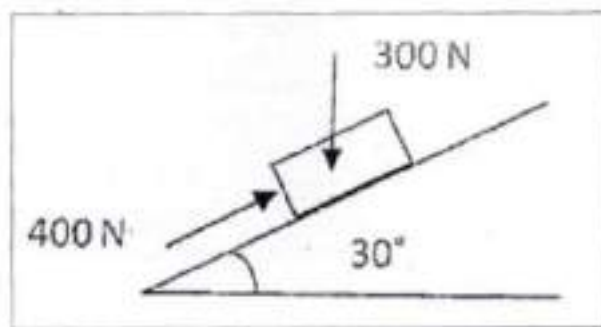
- Derive equations of linear motion with uniform acceleration.
- Define the following.
  - Angular velocity
  - Angular acceleration
  - Angular displacement
- A motorist is traveling at speed of 80 kmph suddenly applies brakes and halts after skidding 60 m if rate of retardation is  $4.12 \text{ m/s}^2$ . Determine coefficient of friction between road and tyre. Use D'Alembert's principle.
- State and derive work energy equation.
- Initial velocity of two balls moving towards each other are 10 m/s and 4 m/s respectively and their velocities after collision are 4 m/s and 10 m/s respectively. Determine coefficient of restitution.
- State and explain types of vibration.

**Q.5 Answer the following question. (Any Two)**

- a) Angular acceleration of flywheel is given by  $\alpha = 12 - t$  where,  $\alpha$  is in radians and  $t$  is in seconds. If the angular velocity of flywheel is 60 rad/sec at the end of 4 seconds. Determine,
- 1) Angular velocity at the end of 6 seconds.
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- b) A pulley of weight 500 N has a radius of 0.5 m. A block weighing 700 N is suspended by a tight rope wound round the pulley the other end being attached to the pulley as shown in below in fig below. Determine the resulting acceleration of the weight and the tension in the rope.



- c) A body weighing 300 N is pushed up a 30° plane by a 400 N force acting parallel to the plane as shown in below. If the initial velocity of the body is 1.5 m/sec. and coefficient of kinetic friction is = 0.2, what velocity will the body have after moving 6 m? Use work energy method.



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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mechanics**

Day & Date: Monday, 20-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Inertia force during retardation acts in \_\_\_\_\_.  
 a) Same direction of motion  
 b) Opposite direction of motion  
 c) Perpendicular to direction of motion  
 d) Both a and b
- 2) 100 rpm is equivalent to \_\_\_\_\_.  
 a) 10.467 rad/sec                      b) 628 rad/sec  
 c) 1.667 rad/sec                      d) 955.414 rad/sec
- 3) Potential energy of body at height h from ground is 2 unit then its kinetic energy when it reaches at ground is \_\_\_\_\_.  
 a) 16 unit                                  b) 4 unit  
 c) 2 unit                                  d) 0
- 4) Centroidal rotation is rotation of body about \_\_\_\_\_.  
 a) Axis parallel to its centroidal axis  
 b) axis perpendicular to its plane of rotation and passing through its centre  
 c) both a and b  
 d) none of these
- 5) Ideal condition(s) assumed in engineering mechanics is (are) \_\_\_\_\_.  
 a) Body is rigid                              b) Body is continuum  
 c) both a and b                              d) Body is plastic
- 6) Capital letters used to indicate spaces between forces is termed as \_\_\_\_\_.  
 a) Newton's Letters                      b) Varignon's notations  
 c) Bow's notations                      d) All of these
- 7) A force can be resolved in to \_\_\_\_\_.  
 a) n components                              b) a force and couple moment  
 c) both a and b                              d) only two components
- 8) If a given truss satisfies mathematical condition  $m = 2j - 3$  then the truss is \_\_\_\_\_.  
 a) redundant                                  b) deficient  
 c) imperfect                                  d) perfect

- Page 12 of 20



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| Seat No. |  |
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**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mechanics**

Day & Date: Monday, 20-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

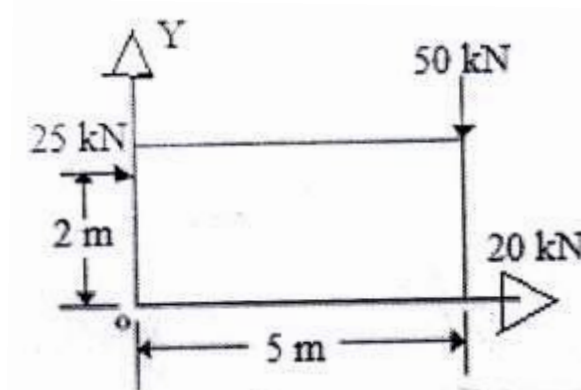
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four)**

12

- State and explain Newton's laws of motion.
- Enlist any three systems of forces.
- Determine resultant and its direction of force system acting on body as shown below.

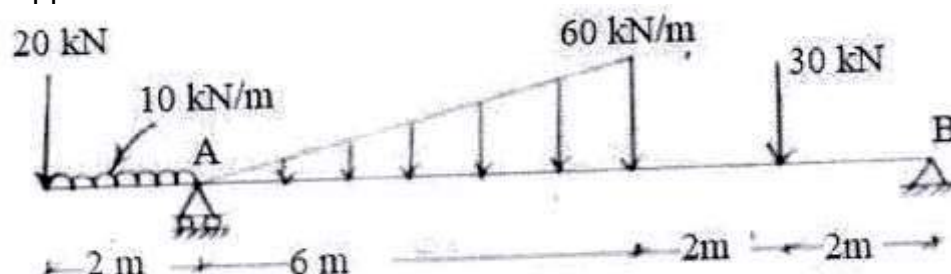


- A block of 200 N is resting on rough horizontal surface. To just slide the block a pull of 50 N is required. Determine coefficient of friction between surface of body and plane.
- Define centroid and moment of inertia.
- What is mean by couple moment? Enlist characteristics of couple moment.

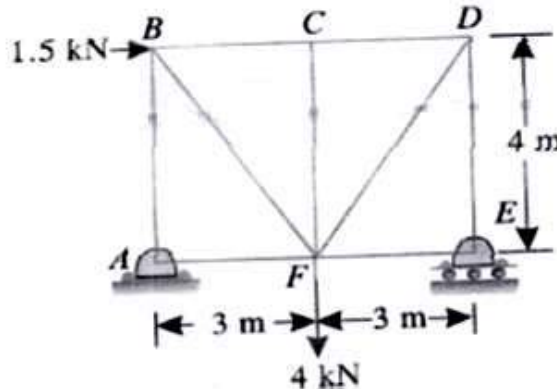
**Q.3 Answer the following question. (Any Two)**

16

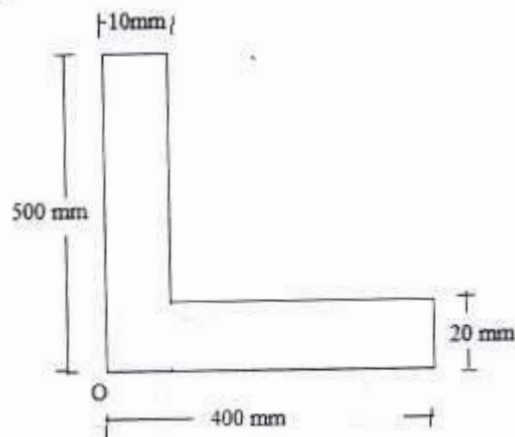
- Determine the support reactions for the beam which is loaded and supported as shown below.



- b) Determine forces and their nature in all the members of a truss which is loaded and supported as shown below.



- c) Locate centroid with respect to reference point O and determine the moment of inertia about polar axis for the L section as shown below



### Section – II

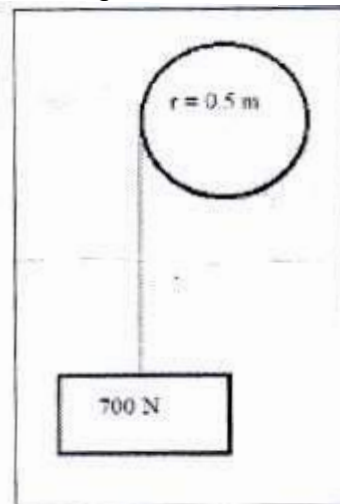
#### Q.4 Answer the following question. (Any Four)

12

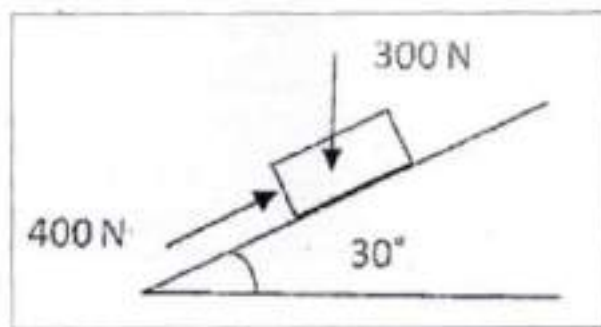
- Derive equations of linear motion with uniform acceleration.
- Define the following.
  - Angular velocity
  - Angular acceleration
  - Angular displacement
- A motorist is traveling at speed of 80 kmph suddenly applies brakes and halts after skidding 60 m if rate of retardation is  $4.12 \text{ m/s}^2$ . Determine coefficient of friction between road and tyre. Use D'Alembert's principle.
- State and derive work energy equation.
- Initial velocity of two balls moving towards each other are 10 m/s and 4 m/s respectively and their velocities after collision are 4 m/s and 10 m/s respectively. Determine coefficient of restitution.
- State and explain types of vibration.

**Q.5 Answer the following question. (Any Two)**

- a) Angular acceleration of flywheel is given by  $\alpha = 12 - t$  where,  $\alpha$  is in radians and  $t$  is in seconds. If the angular velocity of flywheel is 60 rad/sec at the end of 4 seconds. Determine,
- 1) Angular velocity at the end of 6 seconds.
  - 2) Angular acceleration in 13<sup>th</sup> second
  - 3) Number of revolutions at the end of 6 seconds
- b) A pulley of weight 500 N has a radius of 0.5 m. A block weighing 700 N is suspended by a tight rope wound round the pulley the other end being attached to the pulley as shown in below in fig below. Determine the resulting acceleration of the weight and the tension in the rope.



- c) A body weighing 300 N is pushed up a 30° plane by a 400 N force acting parallel to the plane as shown in below. If the initial velocity of the body is 1.5 m/sec. and coefficient of kinetic friction is = 0.2, what velocity will the body have after moving 6 m? Use work energy method.



**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 16 of 20

- 9) Centroidal rotation is rotation of body about \_\_\_\_\_.  
a) Axis parallel to its centroidal axis  
b) axis perpendicular to its plane of rotation and passing through its centre  
c) both a and b  
d) none of these
- 10) Ideal condition(s) assumed in engineering mechanics is (are) \_\_\_\_\_.  
a) Body is rigid  
b) Body is continuum  
c) both a and b  
d) Body is plastic
- 11) Capital letters used to indicate spaces between forces is termed as \_\_\_\_\_.  
a) Newton's Letters  
b) Varignon's notations  
c) Bow's notations  
d) All of these
- 12) A force can be resolved in to \_\_\_\_\_.  
a) n components  
b) a force and couple moment  
c) both a and b  
d) only two components
- 13) If a given truss satisfies mathematical condition  $m = 2j - 3$  then the truss is \_\_\_\_\_.  
a) redundant  
b) deficient  
c) imperfect  
d) perfect
- 14) To start the analysis of truss by method of joints the number of unknown must not be more than \_\_\_\_\_.  
a) two  
b) three  
c) either two or three  
d) four

Seat  
No.

**F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mechanics**

Day & Date: Monday, 20-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

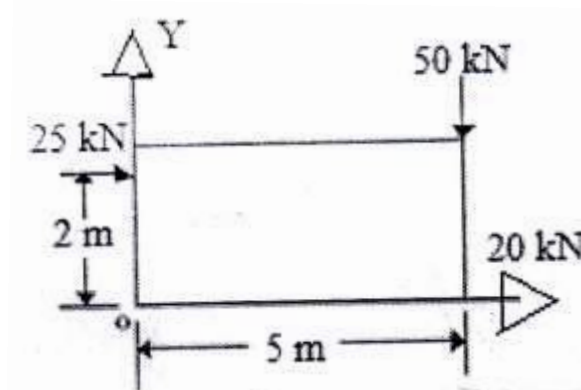
**Instructions:** 1) All questions are compulsory.  
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**Section – I**

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- State and explain Newton's laws of motion.
- Enlist any three systems of forces.
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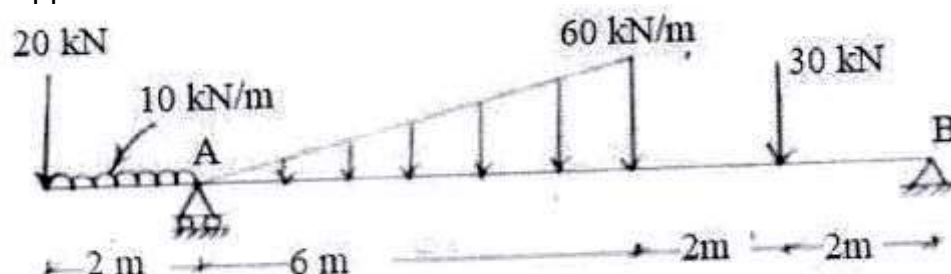


- A block of 200 N is resting on rough horizontal surface. To just slide the block a pull of 50 N is required. Determine coefficient of friction between surface of body and plane.
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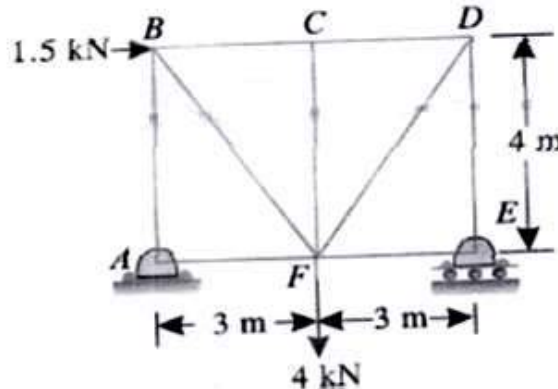
**Q.3 Answer the following question. (Any Two)**

16

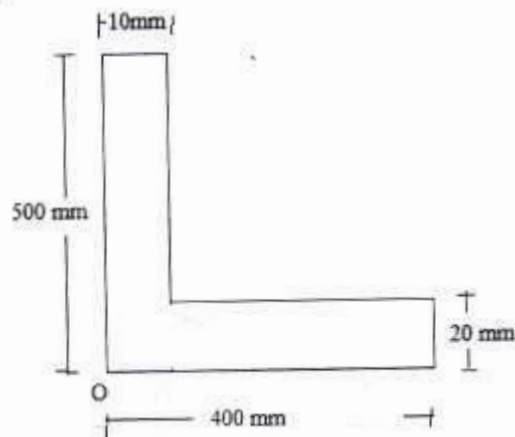
- Determine the support reactions for the beam which is loaded and supported as shown below.



- b) Determine forces and their nature in all the members of a truss which is loaded and supported as shown below.



- c) Locate centroid with respect to reference point O and determine the moment of inertia about polar axis for the L section as shown below



### Section – II

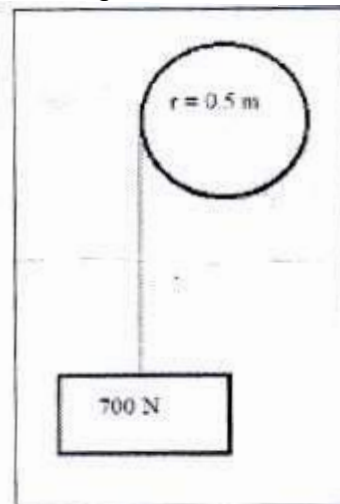
#### Q.4 Answer the following question. (Any Four)

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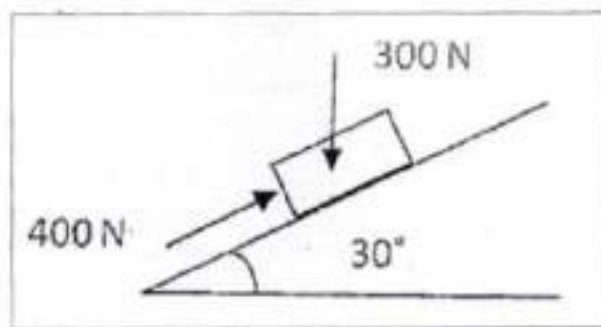
- Derive equations of linear motion with uniform acceleration.
- Define the following.
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| <b>Seat No.</b> |  | <b>Marks Obtained</b> |  | <b>Signature of Examiner</b> |  | <b>Signature of Junior Supervisor</b> |  |
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**F. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Universal Human Values**

Day &amp; Date: Tuesday, 21-03-2023

Max. Marks: 50

Time: 10:00 AM To 11:30 AM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Answer****Q.1 Choose the correct alternatives from the options.**

- 1) What is self-Exploration?
  - a) Process of dialogue between what you are and what you really want to be ☐
  - b) Process of self-evolution through self-investigation
  - c) Process of knowing oneself
  - d) All of the above
- 2) Following are the basic guidelines for value education except \_\_\_\_\_.
  - a) Universal
  - b) Personal
  - c) Rational
  - d) Natural☐
- 3) One of the basic desires of every human being is to be always \_\_\_\_\_.
  - a) Happy
  - b) Sad
  - c) Laugh
  - d) Earn money☐
- 4) Natural acceptance and \_\_\_\_\_ are the two processes of knowing.
  - a) Self-Actualization
  - b) Self-exploration
  - c) Self-Evaluation
  - d) Self-control☐
- 5) Human Life is lived at four levels: Individual, Family, and Society and \_\_\_\_\_.
  - a) Nature
  - b) Nurture
  - c) World
  - d) Universe☐
- 6) Value education should be based on dogmas or blind beliefs \_\_\_\_\_.
  - a) True
  - b) False☐
- 7) Value of an entity is \_\_\_\_\_.
  - a) Physical Facility
  - b) Prosperity
  - c) Its participation in the larger order of which it is part
  - d) both a and b☐
- 8) \_\_\_\_\_ are as Basic Human Aspirations.
  - a) Money
  - b) Relationship without money
  - c) Physical Facility
  - d) Continuous Happiness and Prosperity☐

- 9) For Human beings, physical facility is not required \_\_\_\_\_.  
 a) True b) False ☐
- 10) Please give the correct priority for Physical Facilities, Right Understanding, and Relationship \_\_\_\_\_.  
 a) Physical Facilities, Right Understanding and Relationship  
 b) Relationship, Right Understanding and Physical Facilities  
 c) Right Understanding, Relationship and Physical Facilities  
 d) None of the above ☐
- 11) Right Understanding and Physical Facilities lead to \_\_\_\_\_.  
 a) Mutual Happiness b) Mutual Prosperity  
 c) Both a and b d) All are wrong ☐
- 12) Beside physical facilities human being wants \_\_\_\_\_.  
 a) Name b) Fame  
 c) Relationship d) None of the above ☐
- 13) SVDD stands for \_\_\_\_\_.  
 a) Sadhan Viheen Dukhi Daridra  
 b) Sadhan Sampan Dukhi Daridra  
 c) Sadhan Sampan Sukhi Samridha  
 d) None of the above ☐
- 14) Natural acceptance does not change with \_\_\_\_\_.  
 a) Time b) Place  
 c) Beliefs d) All of above ☐
- 15) When you are living with pre-conditionings and accumulated desires without evaluating them, then it means that you are \_\_\_\_\_.  
 a) Swatantra b) Partantra  
 c) Prosperous d) None ☐
- 16) Sadupyog of the Body mean \_\_\_\_\_ of the Body.  
 a) Self-regulation b) Care  
 c) Happiness d) Right utilization ☐
- 17) Human being is co-existence of the \_\_\_\_\_ and the \_\_\_\_\_.  
 a) Self, Self b) body, body  
 c) self, body d) None ☐
- 18) \_\_\_\_\_ is the feeling of responsibility for nurturing, protecting, and right utilizing the body.  
 a) Swasthya b) Sanyam  
 c) Prosperity d) None ☐
- 19) The activity of desire, thought and expecting together is called as \_\_\_\_\_.  
 a) Body b) Health  
 c) Imagination d) Future ☐
- 20) The \_\_\_\_\_ is an instrument of \_\_\_\_\_.  
 a) I, Body b) Body, I  
 c) Both a and b d) None ☐
- 21) Activities of self (I) are \_\_\_\_\_.  
 a) Happiness b) Desire, thought and Expectation  
 c) Prosperity d) None ☐

- 22) \_\_\_\_\_ is the information we get from the Body through the five sense organs.
- |                       |              |                          |
|-----------------------|--------------|--------------------------|
| a) Precondition       | b) Sensation | <input type="checkbox"/> |
| c) Natural acceptance | d) None      |                          |
- 23) Needs of Body are Temporary whereas needs of Self are continuous \_\_\_\_.
- |         |          |                          |
|---------|----------|--------------------------|
| a) True | b) False | <input type="checkbox"/> |
|---------|----------|--------------------------|
- 24) Which of the following is NOT a response of the Self?
- |                |                    |                          |
|----------------|--------------------|--------------------------|
| a) Knowing     | b) Assuming        | <input type="checkbox"/> |
| c) Recognising | d) Preconditioning |                          |
- 25) Preconditioning is?
- |                             |                             |                          |
|-----------------------------|-----------------------------|--------------------------|
| a) Assuming without knowing | b) Knowing without Assuming | <input type="checkbox"/> |
| c) Only Assuming            | d) Only Knowing             |                          |
- 26) Needs of Body are qualitative whereas needs of Self are quantitative \_\_\_\_.
- |         |          |                          |
|---------|----------|--------------------------|
| a) True | b) False | <input type="checkbox"/> |
|---------|----------|--------------------------|
- 27) Sah-astitva means \_\_\_\_\_.
- |                 |                       |                          |
|-----------------|-----------------------|--------------------------|
| a) Co-existence | b) Co-operation       | <input type="checkbox"/> |
| c) Cooption     | d) Corporate identity |                          |
- 28) Ensuring justice in the relationship, on the basis of values leads to \_\_\_\_\_ in society.
- |                 |              |                          |
|-----------------|--------------|--------------------------|
| a) Fearlessness | b) Confusion | <input type="checkbox"/> |
| c) Confidence   | d) Fear      |                          |
- 29) \_\_\_\_\_ is the foundational value in relationship.
- |            |          |                          |
|------------|----------|--------------------------|
| a) Respect | b) Love  | <input type="checkbox"/> |
| c) Trust   | d) Glory |                          |
- 30) The feeling to nurture and protect the body of our relative is called \_\_\_\_\_.
- |              |              |                          |
|--------------|--------------|--------------------------|
| a) Care      | b) Affection | <input type="checkbox"/> |
| c) Gratitude | d) Respect   |                          |
- 31) \_\_\_\_\_ is the feeling of acceptance for those who have made efforts for my excellence.
- |              |             |                          |
|--------------|-------------|--------------------------|
| a) Reverence | b) Glory    | <input type="checkbox"/> |
| c) Gratitude | d) Guidance |                          |
- 32) \_\_\_\_\_ is a complete value.
- |              |              |                          |
|--------------|--------------|--------------------------|
| a) Love      | b) Affection | <input type="checkbox"/> |
| c) Gratitude | d) Respect   |                          |
- 33) \_\_\_\_\_ is an extension of family.
- |            |           |                          |
|------------|-----------|--------------------------|
| a) Self    | b) Body   | <input type="checkbox"/> |
| c) Society | d) Nature |                          |
- 34) We all are similar at the level of our \_\_\_\_\_ but differ in our \_\_\_\_\_.
- |                           |                          |                          |
|---------------------------|--------------------------|--------------------------|
| a) Competence, Intension  | b) Intension, Competence | <input type="checkbox"/> |
| c) Competence, Competence | d) None                  |                          |
- 35) Abhay means \_\_\_\_\_.
- |                        |                           |                          |
|------------------------|---------------------------|--------------------------|
| a) Right understanding | b) Trust and fearlessness | <input type="checkbox"/> |
| c) Prosperity          | d) Co-existence           |                          |

- 36) \_\_\_\_\_ means one who consumes or experience.  
a) Doer  
b) Seer  
c) Enjoyer  
d) None
- 37) All the units of nature can be classified into \_\_\_\_\_ orders.  
a) Two  
b) Three  
c) Four  
d) Six
- 38) Which of the following does not form an order in nature?  
a) Bio  
b) Animal  
c) Consciousness  
d) Human
- 39) Which of the following statement is not true?  
a) There is interconnectedness in nature  
b) There is recyclability and self-regulation in nature  
c) There is struggle for survival in nature  
d) There is mutual fulfillment in nature
- 40) According to quantity, which of the following is true for the orders in nature?  
a) Bio order >> Physical order >> Animal order >> Human order  
b) Animal order >> Bio order >> Physical order >> Human order  
c) Physical order >> Bio order >> Animal order >> Human order  
d) Physical order >> Animal order >> Bio order >> Human order
- 41) What is NOT acceptable naturally in Nature?  
a) Enrichment of nature  
b) Pollution in nature  
c) Protection of nature  
d) Right Utilization of nature
- 42) Which of the following is NOT a unit of physical order?  
a) Soil  
b) Air  
c) Tree  
d) Water
- 43) There is justice in relationship when there is \_\_\_\_\_.  
a) self-regulation  
b) freedom  
c) Mutual fulfillment  
d) none
- 44) Justice from family to world family leads to \_\_\_\_\_.  
a) Powerful nation  
b) Strong political ties between nations  
c) Undivided society  
d) Disruption of the family structure
- 45) Which of the following is NOT a source of imagination in the self?  
a) Preconditioning  
b) Sensation  
c) Thought  
d) Natural Acceptance
- 46) Which of the following results from over-evaluation?  
a) Ego  
b) Depression  
c) Self-confidence  
d) Trust
- 47) Which of the following statement is true?  
a) Intention of a human being is always doubtful  
b) One's intension is always to make the other happy  
c) Intension of a human keeps varying from time to time  
d) Intension of a human being can never be understood

- 48)** Feeling of relationship exists between \_\_\_\_\_.  
a) Self and self                      b) Body and Body  
c) Self and body                     d) None of the above
- 49)** Which of the following is NOT one of the goals at the level of society?  
a) Right Understanding            b) Fearlessness  
c) Madness for profit               d) Prosperity
- 50)** Intension of a human being is the same as \_\_\_\_\_.  
a) Natural acceptance              b) Competence  
c) Thought                             d) Pre-conditioning

|                 |  |                       |  |                              |  |                                       |  |
|-----------------|--|-----------------------|--|------------------------------|--|---------------------------------------|--|
| <b>Seat No.</b> |  | <b>Marks Obtained</b> |  | <b>Signature of Examiner</b> |  | <b>Signature of Junior Supervisor</b> |  |
|-----------------|--|-----------------------|--|------------------------------|--|---------------------------------------|--|

**F. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Universal Human Values**

Day &amp; Date: Tuesday, 21-03-2023

Max. Marks: 50

Time: 10:00 AM To 11:30 AM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Answer****Q.1 Choose the correct alternatives from the options.**

- 1) Right Understanding and Physical Facilities lead to \_\_\_\_\_.  
 a) Mutual Happiness                      b) Mutual Prosperity  
 c) Both a and b                              d) All are wrong                      ☐
- 2) Beside physical facilities human being wants \_\_\_\_\_.  
 a) Name                                          b) Fame  
 c) Relationship                                d) None of the above                      ☐
- 3) SVDD stands for \_\_\_\_\_.  
 a) Sadhan Viheen Dukhi Daridra  
 b) Sadhan Sampan Dukhi Daridra  
 c) Sadhan Sampan Sukhi Samridha  
 d) None of the above                      ☐
- 4) Natural acceptance does not change with \_\_\_\_\_.  
 a) Time                                          b) Place  
 c) Beliefs                                        d) All of above                      ☐
- 5) When you are living with pre-conditionings and accumulated desires without evaluating them, then it means that you are \_\_\_\_\_.  
 a) Swatantra                                    b) Partantra  
 c) Prosperous                                  d) None                      ☐
- 6) Sadupyog of the Body mean \_\_\_\_\_ of the Body.  
 a) Self-regulation                              b) Care  
 c) Happiness                                    d) Right utilization                      ☐
- 7) Human being is co-existence of the \_\_\_\_\_ and the \_\_\_\_\_.  
 a) Self, Self                                      b) body, body  
 c) self, body                                      d) None                      ☐
- 8) \_\_\_\_\_ is the feeling of responsibility for nurturing, protecting, and right utilizing the body.  
 a) Swasthya                                      b) Sanyam  
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- 10) The \_\_\_\_\_ is an instrument of \_\_\_\_\_.  
a) I, Body                                      b) Body, I  
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- 11) What is NOT acceptable naturally in Nature?  
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d) Disruption of the family structure
- 15) Which of the following is NOT a source of imagination in the self?  
a) Preconditioning                              b) Sensation  
c) Thought                                        d) Natural Acceptance
- 16) Which of the following results from over-evaluation?  
a) Ego                                                b) Depression  
c) Self-confidence                              d) Trust
- 17) Which of the following statement is true?  
a) Intention of a human being is always doubtful  
b) One's intension is always to make the other happy  
c) Intension of a human keeps varying from time to time  
d) Intension of a human being can never be understood
- 18) Feeling of relationship exists between \_\_\_\_\_.  
a) Self and self                                      b) Body and Body  
c) Self and body                                    d) None of the above
- 19) Which of the following is NOT one of the goals at the level of society?  
a) Right Understanding                        b) Fearlessness  
c) Madness for profit                            d) Prosperity
- 20) Intension of a human being is the same as \_\_\_\_\_.  
a) Natural acceptance                            b) Competence  
c) Thought                                         d) Pre-conditioning
- 21) What is self-Exploration?  
a) Process of dialogue between what you are and what you really want to be  
b) Process of self-evolution through self-investigation  
c) Process of knowing oneself  
d) All of the above
- 22) Following are the basic guidelines for value education except \_\_\_\_\_.  
a) Universal                                        b) Personal  
c) Rational                                         d) Natural

- 23) One of the basic desires of every human being is to be always \_\_\_\_\_.  
 a) Happy b) Sad  
 c) Laugh d) Earn money ☐
- 24) Natural acceptance and \_\_\_\_\_ are the two processes of knowing.  
 a) Self-Actualization b) Self-exploration  
 c) Self-Evaluation d) Self-control ☐
- 25) Human Life is lived at four levels: Individual, Family, and Society and \_\_\_\_\_.  
 a) Nature b) Nurture  
 c) World d) Universe ☐
- 26) Value education should be based on dogmas or blind beliefs \_\_\_\_\_.  
 a) True b) False ☐
- 27) Value of an entity is \_\_\_\_\_.  
 a) Physical Facility  
 b) Prosperity  
 c) Its participation in the larger order of which it is part  
 d) both a and b ☐
- 28) \_\_\_\_\_ are as Basic Human Aspirations.  
 a) Money  
 b) Relationship without money  
 c) Physical Facility  
 d) Continuous Happiness and Prosperity ☐
- 29) For Human beings, physical facility is not required \_\_\_\_\_.  
 a) True b) False ☐
- 30) Please give the correct priority for Physical Facilities, Right Understanding, and Relationship \_\_\_\_\_.  
 a) Physical Facilities, Right Understanding and Relationship  
 b) Relationship, Right Understanding and Physical Facilities  
 c) Right Understanding, Relationship and Physical Facilities  
 d) None of the above ☐
- 31) Preconditioning is?  
 a) Assuming without knowing b) Knowing without Assuming  
 c) Only Assuming d) Only Knowing ☐
- 32) Needs of Body are qualitative whereas needs of Self are quantitative \_\_\_\_\_.  
 a) True b) False ☐
- 33) Sah-astitva means \_\_\_\_\_.  
 a) Co-existence b) Co-operation  
 c) Cooption d) Corporate identity ☐
- 34) Ensuring justice in the relationship, on the basis of values leads to \_\_\_\_\_ in society.  
 a) Fearlessness b) Confusion  
 c) Confidence d) Fear ☐
- 35) Activities of self (I) are \_\_\_\_\_.  
 a) Happiness b) Desire, thought and Expectation  
 c) Prosperity d) None ☐



- 36) \_\_\_\_\_ is the information we get from the Body through the five sense organs.
- |                       |              |                          |
|-----------------------|--------------|--------------------------|
| a) Precondition       | b) Sensation | <input type="checkbox"/> |
| c) Natural acceptance | d) None      |                          |
- 37) Needs of Body are Temporary whereas needs of Self are continuous \_\_\_\_.
- |         |          |                          |
|---------|----------|--------------------------|
| a) True | b) False | <input type="checkbox"/> |
|---------|----------|--------------------------|
- 38) Which of the following is NOT a response of the Self?
- |                |                    |                          |
|----------------|--------------------|--------------------------|
| a) Knowing     | b) Assuming        | <input type="checkbox"/> |
| c) Recognising | d) Preconditioning |                          |
- 39) \_\_\_\_\_ is the foundational value in relationship.
- |            |          |                          |
|------------|----------|--------------------------|
| a) Respect | b) Love  | <input type="checkbox"/> |
| c) Trust   | d) Glory |                          |
- 40) The feeling to nurture and protect the body of our relative is called \_\_\_\_.
- |              |              |                          |
|--------------|--------------|--------------------------|
| a) Care      | b) Affection | <input type="checkbox"/> |
| c) Gratitude | d) Respect   |                          |
- 41) Abhay means \_\_\_\_.
- |                        |                           |                          |
|------------------------|---------------------------|--------------------------|
| a) Right understanding | b) Trust and fearlessness | <input type="checkbox"/> |
| c) Prosperity          | d) Co-existence           |                          |
- 42) \_\_\_\_\_ means one who consumes or experience.
- |            |         |                          |
|------------|---------|--------------------------|
| a) Doer    | b) Seer | <input type="checkbox"/> |
| c) Enjoyer | d) None |                          |
- 43) All the units of nature can be classified into \_\_\_\_\_ orders.
- |         |          |                          |
|---------|----------|--------------------------|
| a) Two  | b) Three | <input type="checkbox"/> |
| c) Four | d) Six   |                          |
- 44) Which of the following does not form an order in nature?
- |                  |           |                          |
|------------------|-----------|--------------------------|
| a) Bio           | b) Animal | <input type="checkbox"/> |
| c) Consciousness | d) Human  |                          |
- 45) \_\_\_\_\_ is the feeling of acceptance for those who have made efforts for my excellence.
- |              |             |                          |
|--------------|-------------|--------------------------|
| a) Reverence | b) Glory    | <input type="checkbox"/> |
| c) Gratitude | d) Guidance |                          |
- 46) \_\_\_\_\_ is a complete value.
- |              |              |                          |
|--------------|--------------|--------------------------|
| a) Love      | b) Affection | <input type="checkbox"/> |
| c) Gratitude | d) Respect   |                          |
- 47) \_\_\_\_\_ is an extension of family.
- |            |           |                          |
|------------|-----------|--------------------------|
| a) Self    | b) Body   | <input type="checkbox"/> |
| c) Society | d) Nature |                          |
- 48) We all are similar at the level of our \_\_\_\_\_ but differ in our \_\_\_\_.
- |                           |                          |                          |
|---------------------------|--------------------------|--------------------------|
| a) Competence, Intension  | b) Intension, Competence | <input type="checkbox"/> |
| c) Competence, Competence | d) None                  |                          |
- 49) Which of the following statement is not true?
- |                                                         |                          |
|---------------------------------------------------------|--------------------------|
| a) There is interconnectedness in nature                | <input type="checkbox"/> |
| b) There is recyclability and self-regulation in nature |                          |
| c) There is struggle for survival in nature             |                          |
| d) There is mutual fulfillment in nature                |                          |

**50)** According to quantity, which of the following is true for the orders in nature?

- a) Bio order >> Physical order >> Animal order >> Human order
- b) Animal order >> Bio order >> Physical order >> Human order
- c) Physical order >> Bio order >> Animal order >> Human order
- d) Physical order >> Animal order >> Bio order >> Human order

☐



- 10) According to quantity, which of the following is true for the orders in nature?
- a) Bio order >> Physical order >> Animal order >> Human order ☐
- b) Animal order >> Bio order >> Physical order >> Human order
- c) Physical order >> Bio order >> Animal order >> Human order
- d) Physical order >> Animal order >> Bio order >> Human order
- 11) Activities of self (I) are \_\_\_\_\_.  
 a) Happiness  
 b) Desire, thought and Expectation  
 c) Prosperity  
 d) None ☐
- 12) \_\_\_\_\_ is the information we get from the Body through the five sense organs.  
 a) Precondition  
 b) Sensation  
 c) Natural acceptance  
 d) None ☐
- 13) Needs of Body are Temporary whereas needs of Self are continuous \_\_\_\_\_.  
 a) True  
 b) False ☐
- 14) Which of the following is NOT a response of the Self?  
 a) Knowing  
 b) Assuming  
 c) Recognising  
 d) Preconditioning ☐
- 15) Preconditioning is?  
 a) Assuming without knowing  
 b) Knowing without Assuming  
 c) Only Assuming  
 d) Only Knowing ☐
- 16) Needs of Body are qualitative whereas needs of Self are quantitative \_\_\_\_\_.  
 a) True  
 b) False ☐
- 17) Sah-astitva means \_\_\_\_\_.  
 a) Co-existence  
 b) Co-operation  
 c) Cooption  
 d) Corporate identity ☐
- 18) Ensuring justice in the relationship, on the basis of values leads to \_\_\_\_\_ in society.  
 a) Fearlessness  
 b) Confusion  
 c) Confidence  
 d) Fear ☐
- 19) \_\_\_\_\_ is the foundational value in relationship.  
 a) Respect  
 b) Love  
 c) Trust  
 d) Glory ☐
- 20) The feeling to nurture and protect the body of our relative is called \_\_\_\_\_.  
 a) Care  
 b) Affection  
 c) Gratitude  
 d) Respect ☐
- 21) What is NOT acceptable naturally in Nature?  
 a) Enrichment of nature  
 b) Pollution in nature  
 c) Protection of nature  
 d) Right Utilization of nature ☐
- 22) Which of the following is NOT a unit of physical order?  
 a) Soil  
 b) Air  
 c) Tree  
 d) Water ☐

- 

- 24)** Justice from family to world family leads to \_\_\_\_\_.
- a) Powerful nation
  - b) Strong political ties between nations
  - c) Undivided society
  - d) Disruption of the family structure

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- 25)** Which of the following is NOT a source of imagination in the self?
- |                    |                       |
|--------------------|-----------------------|
| a) Preconditioning | b) Sensation          |
| c) Thought         | d) Natural Acceptance |

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- 26)** Which of the following results from over-evaluation?
- a) Ego                                      b) Depression
- c) Self-confidence                      d) Trust

- 1

- 27)** Which of the following statement is true?
- a) Intention of a human being is always doubtful
  - b) One's intension is always to make the other happy
  - c) Intension of a human keeps varying from time to time
  - d) Intension of a human being can never be understood

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- 28)** Feeling of relationship exists between \_\_\_\_\_.  
 a) Self and self                      b) Body and Body  
 c) Self and body                     d) None of the above

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- 29)** Which of the following is NOT one of the goals at the level of society?
- a) Right Understanding                      b) Fearlessness  
c) Madness for profit                      d) Prosperity

- 30)** Intension of a human being is the same as \_\_\_\_\_.  
a) Natural acceptance                      b) Competence  
c) Thought                                      d) Pre-conditioning

- 10

- 31)** Right Understanding and Physical Facilities lead to \_\_\_\_\_.  
 a) Mutual Happiness                      b) Mutual Prosperity  
 c) Both a and b                          d) All are wrong

- 10

- 32)** Beside physical facilities human being wants \_\_\_\_\_.  
 a) Name                                      b) Fame  
 c) Relationship                            d) None of the above

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- 33)** SVDD stands for \_\_\_\_\_.  
a) Sadhan Viheen Dukhi Daridra  
b) Sadhan Sampan Dukhi Daridra  
c) Sadhan Sampan Sukhi Samridha  
d) None of the above

- 10

- 34)** Natural acceptance does not change with \_\_\_\_\_.  
a) Time                                      b) Place  
c) Beliefs                                    d) All of above

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- 35)** When you are living with pre-conditionings and accumulated desires without evaluating them, then it means that you are \_\_\_\_\_.  
a) Swatantra                      b) Partantra  
c) Prosperous                  d) None

- 10

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- 37)** Human being is co-existence of the \_\_\_\_\_ and the \_\_\_\_\_.  
 a) Self, Self                      b) body, body  
 c) self, body                        d) None

- 

- 38)** \_\_\_\_\_ is the feeling of responsibility for nurturing, protecting, and right utilizing the body.

- a) Swasthya                      b) Sanyam  
c) Prosperity                  d) None

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- 39)** The activity of desire, thought and expecting together is called as \_\_\_\_\_.

- a) Body                      b) Health  
c) Imagination          d) Future

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- 40)** The \_\_\_\_\_ is an instrument of \_\_\_\_\_.

- a) I, Body                      b) Body, I  
c) Both a and b                d) None

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- 41) What is self-Exploration?**

- Process of dialogue between what you are and what you really want to be
- Process of self-evolution through self-investigation
- Process of knowing oneself
- All of the above

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- 42)** Following are the basic guidelines for value education except \_\_\_\_\_.

- a) Universal                      b) Personal  
c) Rational                        d) Natural

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- 43)** One of the basic desires of every human being is to be always \_\_\_\_\_.

- a) Happy                      b) Sad  
c) Laugh                     d) Earn money

- 11

- 44)** Natural acceptance and \_\_\_\_\_ are the two processes of knowing.

- a) Self-Actualization      b) Self-exploration  
c) Self-Evaluation        d) Self-control

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- 45)** Human Life is lived at four levels: Individual, Family, and Society and \_\_\_\_\_.

- a) Nature  
b) Nurture  
c) World  
d) Universe

- |  |  |
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- 46)** Value education should be based on dogmas or blind beliefs \_\_\_\_\_.

- a) True                      b) False

- |  |  |
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- 47)** Value of an entity is \_\_\_\_\_.

- Physical Facility
- Prosperity
- Its participation in the larger order of which it is part
- both a and b

- |  |  |
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- 48)** \_\_\_\_\_ are as Basic Human Aspirations.

- Money
- Relationship without money
- Physical Facility
- Continuous Happiness and Prosperity

- |  |  |
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**49)** For Human beings, physical facility is not required \_\_\_\_\_.

a) True

b) False

|  |
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**50)** Please give the correct priority for Physical Facilities, Right Understanding, and Relationship \_\_\_\_\_.

a) Physical Facilities, Right Understanding and Relationship

b) Relationship, Right Understanding and Physical Facilities

c) Right Understanding, Relationship and Physical Facilities

d) None of the above

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|----------|--|----------------|--|-----------------------|--|--------------------------------|--|
| Seat No. |  | Marks Obtained |  | Signature of Examiner |  | Signature of Junior Supervisor |  |
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**F. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Universal Human Values**

Day &amp; Date: Tuesday, 21-03-2023

Max. Marks: 50

Time: 10:00 AM To 11:30 AM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Answer****Q.1 Choose the correct alternatives from the options.**

- 1) What is NOT acceptable naturally in Nature?
 

|                         |                                |                      |
|-------------------------|--------------------------------|----------------------|
| a) Enrichment of nature | b) Pollution in nature         | <input type="text"/> |
| c) Protection of nature | d) Right Utilization of nature |                      |
- 2) Which of the following is NOT a unit of physical order?
 

|         |          |                      |
|---------|----------|----------------------|
| a) Soil | b) Air   | <input type="text"/> |
| c) Tree | d) Water |                      |
- 3) There is justice in relationship when there is \_\_\_\_\_.
 

|                       |            |                      |
|-----------------------|------------|----------------------|
| a) self-regulation    | b) freedom | <input type="text"/> |
| c) Mutual fulfillment | d) none    |                      |
- 4) Justice from family to world family leads to \_\_\_\_\_.
 

|                                          |                      |
|------------------------------------------|----------------------|
| a) Powerful nation                       | <input type="text"/> |
| b) Strong political ties between nations |                      |
| c) Undivided society                     |                      |
| d) Disruption of the family structure    |                      |
- 5) Which of the following is NOT a source of imagination in the self?
 

|                    |                       |                      |
|--------------------|-----------------------|----------------------|
| a) Preconditioning | b) Sensation          | <input type="text"/> |
| c) Thought         | d) Natural Acceptance |                      |
- 6) Which of the following results from over-evaluation?
 

|                    |               |                      |
|--------------------|---------------|----------------------|
| a) Ego             | b) Depression | <input type="text"/> |
| c) Self-confidence | d) Trust      |                      |
- 7) Which of the following statement is true?
 

|                                                         |                      |
|---------------------------------------------------------|----------------------|
| a) Intention of a human being is always doubtful        | <input type="text"/> |
| b) One's intension is always to make the other happy    |                      |
| c) Intension of a human keeps varying from time to time |                      |
| d) Intension of a human being can never be understood   |                      |
- 8) Feeling of relationship exists between \_\_\_\_\_.
 

|                  |                      |                      |
|------------------|----------------------|----------------------|
| a) Self and self | b) Body and Body     | <input type="text"/> |
| c) Self and body | d) None of the above |                      |
- 9) Which of the following is NOT one of the goals at the level of society?
 

|                        |                 |
|------------------------|-----------------|
| a) Right Understanding | b) Fearlessness |
| c) Madness for profit  | d) Prosperity   |



- 10) Intension of a human being is the same as \_\_\_\_\_.  
 a) Natural acceptance                      b) Competence  
 c) Thought                                      d) Pre-conditioning ☐
- 11) What is self-Exploration?  
 a) Process of dialogue between what you are and what you really want to be  
 b) Process of self-evolution through self-investigation  
 c) Process of knowing oneself  
 d) All of the above ☐
- 12) Following are the basic guidelines for value education except \_\_\_\_\_.  
 a) Universal                                      b) Personal  
 c) Rational                                      d) Natural ☐
- 13) One of the basic desires of every human being is to be always \_\_\_\_\_.  
 a) Happy                                              b) Sad  
 c) Laugh                                              d) Earn money ☐
- 14) Natural acceptance and \_\_\_\_\_ are the two processes of knowing.  
 a) Self-Actualization                      b) Self-exploration  
 c) Self-Evaluation                              d) Self-control ☐
- 15) Human Life is lived at four levels: Individual, Family, and Society and \_\_\_\_\_.  
 a) Nature                                              b) Nurture  
 c) World                                              d) Universe ☐
- 16) Value education should be based on dogmas or blind beliefs \_\_\_\_\_.  
 a) True                                              b) False ☐
- 17) Value of an entity is \_\_\_\_\_.  
 a) Physical Facility  
 b) Prosperity  
 c) Its participation in the larger order of which it is part  
 d) both a and b ☐
- 18) \_\_\_\_\_ are as Basic Human Aspirations.  
 a) Money  
 b) Relationship without money  
 c) Physical Facility  
 d) Continuous Happiness and Prosperity ☐
- 19) For Human beings, physical facility is not required \_\_\_\_\_.  
 a) True                                              b) False ☐
- 20) Please give the correct priority for Physical Facilities, Right Understanding, and Relationship \_\_\_\_\_.  
 a) Physical Facilities, Right Understanding and Relationship  
 b) Relationship, Right Understanding and Physical Facilities  
 c) Right Understanding, Relationship and Physical Facilities  
 d) None of the above ☐
- 21) \_\_\_\_\_ is the feeling of acceptance for those who have made efforts for my excellence.  
 a) Reverence                                      b) Glory  
 c) Gratitude                                      d) Guidance ☐

- Page 18 of 20

- 35) Preconditioning is?  
 a) Assuming without knowing      b) Knowing without Assuming  
 c) Only Assuming      d) Only Knowing ☐
- 36) Needs of Body are qualitative whereas needs of Self are quantitative \_\_\_\_\_.  
 a) True      b) False ☐
- 37) Sah-astitva means \_\_\_\_\_.  
 a) Co-existence      b) Co-operation  
 c) Cooption      d) Corporate identity ☐
- 38) Ensuring justice in the relationship, on the basis of values leads to \_\_\_\_\_ in society.  
 a) Fearlessness      b) Confusion  
 c) Confidence      d) Fear ☐
- 39) Sadupyog of the Body mean \_\_\_\_\_ of the Body.  
 a) Self-regulation      b) Care  
 c) Happiness      d) Right utilization ☐
- 40) Human being is co-existence of the \_\_\_\_\_ and the \_\_\_\_\_.  
 a) Self, Self      b) body, body  
 c) self, body      d) None ☐
- 41) The feeling to nurture and protect the body of our relative is called \_\_\_\_\_.  
 a) Care      b) Affection  
 c) Gratitude      d) Respect ☐
- 42) Right Understanding and Physical Facilities lead to \_\_\_\_\_.  
 a) Mutual Happiness      b) Mutual Prosperity  
 c) Both a and b      d) All are wrong ☐
- 43) \_\_\_\_\_ is the foundational value in relationship.  
 a) Respect      b) Love  
 c) Trust      d) Glory ☐
- 44) Natural acceptance does not change with \_\_\_\_\_.  
 a) Time      b) Place  
 c) Beliefs      d) All of above ☐
- 45) When you are living with pre-conditionings and accumulated desires without evaluating them, then it means that you are \_\_\_\_\_.  
 a) Swatantra      b) Partantra  
 c) Prosperous      d) None ☐
- 46) \_\_\_\_\_ is the feeling of responsibility for nurturing, protecting, and right utilizing the body.  
 a) Swasthya      b) Sanyam  
 c) Prosperity      d) None ☐
- 47) The activity of desire, thought and expecting together is called as \_\_\_\_\_.  
 a) Body      b) Health  
 c) Imagination      d) Future ☐
- 48) The \_\_\_\_\_ is an instrument of \_\_\_\_\_.  
 a) I, Body      b) Body, I  
 c) Both a and b      d) None ☐

- 49)** Beside physical facilities human being wants \_\_\_\_\_.  
 a) Name  
 b) Fame  
 c) Relationship  
 d) None of the above
- 50)** SVDD stands for \_\_\_\_\_.  
 a) Sadhan Viheen Dukhi Daridra  
 b) Sadhan Sampan Dukhi Daridra  
 c) Sadhan Sampan Sukhi Samridha  
 d) None of the above

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Set **P**

**F.Y. (B. Tech) (Sem – II) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Graphics & CAD**

Day & Date: Monday, 06-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:**
- 1) All questions from each section are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Retain all construction lines
  - 4) Assume suitable dimensions, wherever required and mention it clearly.
  - 5) All dimensions are in 'mm'.
  - 6) Return all the answer-sheet supplied irrespective of their use.

**\*Note: Objectives type Question paper must be returned after first 40 minutes strictly.**

**Section – I**

- Q.1 Solve any FOUR: (Objective Type) 14**
1. Attempt any two questions from a) to d)
  2. Questions e) & f) are compulsory.
- a) **Refer Fig.(a):** Complete projection of line AB if **03**
- 1) Its inclination of line with VP is  $50^\circ$
  - 2) Top view length 65mm
  - 3) End point 'B' is 65 mm above HRP. Find True length.
- b) **Refer Fig.(b):** Complete projections of line AB and find its grade if **03**
- 1) True length is 70mm
  - 2) its inclination with VP is  $45^\circ$
  - 3) its inclination with HP is  $30^\circ$
- c) **Refer Fig.(c):** Complete projection of line CD and find its true length if **03**
- 1) grade is 70% w.r.to 'C'
  - 2) Bearing is S 55 E w.r.to 'C'
  - 3) Top view of line measure 60mm.
- d) **Refer Fig.(d):** Complete projection of line PQ if **03**
- 1) its inclination with horizontal plane is  $45^\circ$
  - 2) Bearing with respect to Q is N 60 W
  - 3) Elevation length is 60 mm. Find True length.
- e) **Refer Fig.(e):** Complete projections of an equilateral triangle ABC **04**
- f) **Refer Fig.(f) :** Find the strike and Dip of Plane PQR **04**
- Q.2 Solve the following: 11**
- a) A line AB has its front view length of 50 mm with a true length of 70 mm. **04**  
 The inclination with horizontal reference plane is  $45^\circ$ . Draw the projections of AB & find its true inclination with frontal reference plane. Consider point A 20 mm above horizontal reference plane and 20 mm in front of vertical plane.

- b) A line AB carries a front view length of 50 mm and apparent inclination of  $45^\circ$  with horizontal reference plane. The line carries a true inclination of  $30^\circ$  with frontal reference plane. Complete the projections of the line and determine the true inclination with horizontal reference plane. Consider point A 20 mm above horizontal reference plane and 20 mm in front of vertical plane. **03**
- c) A rhombus ABCD having diagonals 50 mm and 80 mm long has its corner A in the frontal plane. The longer diagonal inclined at  $45^\circ$  to frontal plane. Complete the projections. **04**

**Q.3** A hexagon of 30 mm side has its side AB in horizontal reference plane and inclined at  $35^\circ$  to frontal reference plane. The surface of the plane makes an angle of  $45^\circ$  with the horizontal reference plane. Complete the projections of the plane. **07**

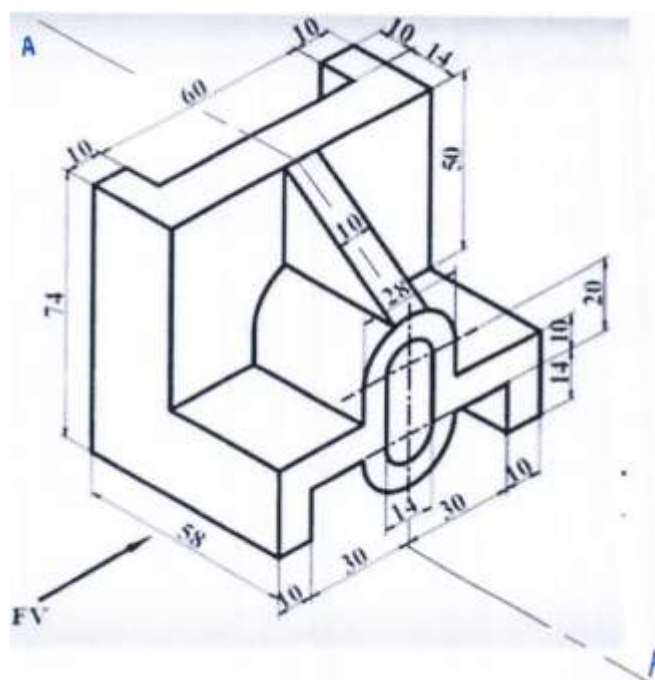
**Q.4** A Square prism, side of base 40 mm & axis 60 mm long has a corner of base in Horizontal reference plane and the axis is inclined at  $40^\circ$  to horizontal reference plane. The lower edge through the corner in horizontal reference plane makes  $30^\circ$  to vertical reference plane. Complete its projections. **10**

**OR**

A square pyramid, base 40 mm side & axis 60 mm long, has side of base in horizontal reference plane & inclined at  $30^\circ$  to vertical reference plane. The axis of the pyramid is inclined at  $45^\circ$  to horizontal reference plane. Complete its projections, when the apex is nearer to observer.

## Section – II

- Q.5** Fig. Shows isometric view of machine component. Draw the following views **18**
- Sectional F. V. looking in the direction FV (Section A-A)
  - Right hand side view
  - Top view



- Q.6** A square pyramid base 30 mm side and axis 50 mm long stands vertically on the ground with the edge of the base equally inclined to vertical plane. It is cut by a section plane perpendicular to vertical reference plane and inclined at  $45^\circ$  to horizontal reference plane, passing through a point on axis 20 mm from apex. Draw the front view, sectional top view and true shape of section. **10**

**OR**

A cylinder, diameter of base 60 mm & height 80 mm has its base in horizontal reference plane. It is to be cut by an auxiliary inclined plane in such a way that true shape of section is an ellipse with maximum possible size. Draw front view, sectional top view and true shape of section.

**Seat  
No.**

Max. Marks: 70

- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 1 of 16



- 10)** The collector of transistor is \_\_\_\_\_ doped.
- |               |            |
|---------------|------------|
| a) Lightly    | b) Heavily |
| c) Moderately | d) None    |
- 11)** In transistor \_\_\_\_\_.
- |                      |                      |
|----------------------|----------------------|
| a) $I_C = I_E + I_B$ | b) $I_B = I_C + I_E$ |
| c) $I_E = I_C - I_B$ | d) $I_E = I_C + I_B$ |
- 12)** The gauge factor is defined as
- |                                  |                                            |
|----------------------------------|--------------------------------------------|
| a) $(\Delta L/L) / (\Delta R/R)$ | b) $(\Delta R/R) / (\Delta L/L)$           |
| c) $(\Delta R/R) / (\Delta D/D)$ | d) $(\Delta R/R) / (\Delta \sigma/\sigma)$ |
- 13)** What is moving part of LVDT
- |              |              |
|--------------|--------------|
| a) Primary   | b) Secondary |
| c) Diaphragm | d) Core      |
- 14)** 1's complement of  $(10111010)_2$  is
- |                   |                |
|-------------------|----------------|
| a) $(01000101)_2$ | b) $(11111)_2$ |
| c) $(010001)_2$   | d) $(1111)_2$  |

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**F.Y (B. Tech) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Basic Electrical & Electronics Engineering**

Day & Date: Wednesday, 08-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Define resistance and discuss the factors on which resistance of conductor material depends.
- b) Two coils connected in series have a resistance of  $18\Omega$  and when connected in parallel have a resistance of  $4\Omega$ . Find the value of resistances.
- c) Explain the term (i) mmf, (ii) Flux, (iii) Permeability, (iv) Reluctance.
- d) Define and derive expression for average value for sinusoidal current in terms of its maximum value.
- e) Derive expression for purely capacitive circuit. Explain concept of capacitive reactance.
- f) Derive the relationship between line and phase quantities in balanced star connected 3 - phase load.

**Q.3 Solve any two.** **12**

- a) Describe the importance of delta - star transformation. If three resistances are connected in delta - connection, then find the equivalent values of these resistances for star – connections.
- b) A coil of resistance  $10\Omega$  and an inductance of  $0.2H$  is connected in series with a capacitor of  $50.7\mu F$ . The circuit is connected across a  $100V$ ,  $50Hz$ , single phase supply. Find i) the current flowing ii) the voltage across capacitors iii) the voltage across the coil iv) power factor of the coil. Draw the phasor diagram.
- c) A flux density of  $1.3T$  is required in  $3.5mm$  air gap of an electromagnet wound with  $550$  turns of wire and having an iron path of  $130cm$ . calculate the current required assuming that a relative permeability of  $1200$  for iron and neglecting the leakage and fringing.

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain working of BJT as switch.
- b) Explain Full wave rectifier with necessary diagrams.
- c) Convert (DBD)  $H$  to decimal and octal.
- d) What is meant by universal gate? Derive basic gates using NAND and NOR gate.
- e) Explain thermocouple for the measurement of temp. In detail.
- f) Explain VI characteristics of PN junction diode.

**Q.5 Solve any two**

- a)** Explain the following transducer: 1) Thermocouple 2) Load Cell
- b)** Explain construction and operation of light emitting diode. Write applications of it and explain any one in detail.
- c)** Explain with symbol, equation, truth table following logic gates.
  - a) XOR b) NAND c) NOR d) NOT e) AND

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- 10) The basic requirement for inducing e.m.f in a coil is that \_\_\_\_\_.  
a) lux should link the coil  
b) there should be change in lux linking the coil  
c) coil should form a closed loop  
d) none of the above
- 11) The capacitive reactance  $X_c$  \_\_\_\_\_ with \_\_\_\_\_ in frequency.  
a) Increases, increase  
b) Decreases, decreases  
c) Increases, decreases  
d) Remains constant, any change
- 12) For R-L-C series circuit if  $X_L = X_C$  then then power factor  $\cos \phi =$   
a) 1  
b) 0  
c) 0.1  
d) 0.5
- 13) The power taken by a 3 -  $\phi$  load is given by the expression  
a)  $3V_{LL} \cos \phi$   
b)  $\sqrt{3}V_{LL} \cos \phi$   
c)  $3V_{LL} \sin \phi$   
d)  $\sqrt{3}V_{LL} \sin \phi$
- 14) A 3 - phase load is balanced if all the three phases have the same \_\_\_\_\_.  
a) Impedance  
b) power factor  
c) impedance & power factor  
d) none of these

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Set **Q**

**F.Y (B. Tech) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Basic Electrical & Electronics Engineering**

Day & Date: Wednesday, 08-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Solve any four.** **16**

- a) Define resistance and discuss the factors on which resistance of conductor material depends.
- b) Two coils connected in series have a resistance of  $18\Omega$  and when connected in parallel have a resistance of  $4\Omega$ . Find the value of resistances.
- c) Explain the term (i) mmf, (ii) Flux, (iii) Permeability, (iv) Reluctance.
- d) Define and derive expression for average value for sinusoidal current in terms of its maximum value.
- e) Derive expression for purely capacitive circuit. Explain concept of capacitive reactance.
- f) Derive the relationship between line and phase quantities in balanced star connected 3 - phase load.

**Q.3 Solve any two.** **12**

- a) Describe the importance of delta - star transformation. If three resistances are connected in delta - connection, then find the equivalent values of these resistances for star – connections.
- b) A coil of resistance  $10\Omega$  and an inductance of  $0.2H$  is connected in series with a capacitor of  $50.7\mu F$ . The circuit is connected across a  $100V$ ,  $50Hz$ , single phase supply. Find i) the current flowing ii) the voltage across capacitors iii) the voltage across the coil iv) power factor of the coil. Draw the phasor diagram.
- c) A flux density of  $1.3T$  is required in  $3.5mm$  air gap of an electromagnet wound with  $550$  turns of wire and having an iron path of  $130cm$ . calculate the current required assuming that a relative permeability of  $1200$  for iron and neglecting the leakage and fringing.

**Section II****Q.4 Solve any four.** **16**

- a) Explain working of BJT as switch.
- b) Explain Full wave rectifier with necessary diagrams.
- c) Convert (DBD)  $H$  to decimal and octal.
- d) What is meant by universal gate? Derive basic gates using NAND and NOR gate.
- e) Explain thermocouple for the measurement of temp. In detail.
- f) Explain VI characteristics of PN junction diode.

**Q.5 Solve any two**

- a)** Explain the following transducer: 1) Thermocouple 2) Load Cell
- b)** Explain construction and operation of light emitting diode. Write applications of it and explain any one in detail.
- c)** Explain with symbol, equation, truth table following logic gates.
  - a) XOR b) NAND c) NOR d) NOT e) AND

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**F.Y (B. Tech) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Basic Electrical & Electronics Engineering**

Day & Date: Wednesday, 08-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In transistor \_\_\_\_\_.
  - a)  $I_c = I_E + I_B$
  - b)  $I_B = I_c + I_E$
  - c)  $I_E = I_c - I_B$
  - d)  $I_E = I_c + I_B$
- 2) The gauge factor is defined as
  - a)  $(\Delta L/L) / (\Delta R/R)$
  - b)  $(\Delta R/R) / (\Delta L/L)$
  - c)  $(\Delta R/R) / (\Delta D/D)$
  - d)  $(\Delta R/R) / (\Delta \sigma/\sigma)$
- 3) What is moving part of LVDT
  - a) Primary
  - b) Secondary
  - c) Diaphragm
  - d) Core
- 4) 1's complement of  $(10111010)_2$  is
  - a)  $(01000101)_2$
  - b)  $(11111)_2$
  - c)  $(010001)_2$
  - d)  $(1111)_2$
- 5) Unit of resistivity is \_\_\_\_\_.
  - a)  $\Omega.m$
  - b)  $\Omega.m^2$
  - c)  $\Omega$
  - d) m
- 6) Flux density  $B = ?$ 
  - a)  $\mu_o \mu_r / H$
  - b)  $\mu_o H / \mu_r$
  - c)  $\mu_o \mu_r H$
  - d)  $(\mu_o)^2 H$
- 7) The basic requirement for inducing e.m.f in a coil is that \_\_\_\_\_.
  - a) flux should link the coil
  - b) there should be change in flux linking the coil
  - c) coil should form a closed loop
  - d) none of the above
- 8) The capacitive reactance  $X_c$  \_\_\_\_\_ with \_\_\_\_\_ in frequency.
  - a) Increases, increase
  - b) Decreases, decreases
  - c) Increases, decreases
  - d) Remains constant, any change
- 9) For R-L-C series circuit if  $X_L = X_C$  then power factor  $\cos \phi =$ 
  - a) 1
  - b) 0
  - c) 0.1
  - d) 0.5





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Set **R**

**F.Y (B. Tech) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Basic Electrical & Electronics Engineering**

Day & Date: Wednesday, 08-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I**

**Q.2 Solve any four.** **16**

- a) Define resistance and discuss the factors on which resistance of conductor material depends.
- b) Two coils connected in series have a resistance of  $18\Omega$  and when connected in parallel have a resistance of  $4\Omega$ . Find the value of resistances.
- c) Explain the term (i) mmf, (ii) Flux, (iii) Permeability, (iv) Reluctance.
- d) Define and derive expression for average value for sinusoidal current in terms of its maximum value.
- e) Derive expression for purely capacitive circuit. Explain concept of capacitive reactance.
- f) Derive the relationship between line and phase quantities in balanced star connected 3 - phase load.

**Q.3 Solve any two.** **12**

- a) Describe the importance of delta - star transformation. If three resistances are connected in delta - connection, then find the equivalent values of these resistances for star – connections.
- b) A coil of resistance  $10\Omega$  and an inductance of  $0.2H$  is connected in series with a capacitor of  $50.7\mu F$ . The circuit is connected across a  $100V$ ,  $50Hz$ , single phase supply. Find i) the current flowing ii) the voltage across capacitors iii) the voltage across the coil iv) power factor of the coil. Draw the phasor diagram.
- c) A flux density of  $1.3T$  is required in  $3.5mm$  air gap of an electromagnet wound with  $550$  turns of wire and having an iron path of  $130cm$ . calculate the current required assuming that a relative permeability of  $1200$  for iron and neglecting the leakage and fringing.

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain working of BJT as switch.
- b) Explain Full wave rectifier with necessary diagrams.
- c) Convert (DBD)  $H$  to decimal and octal.
- d) What is meant by universal gate? Derive basic gates using NAND and NOR gate.
- e) Explain thermocouple for the measurement of temp. In detail.
- f) Explain VI characteristics of PN junction diode.

**Q.5 Solve any two**

- a)** Explain the following transducer: 1) Thermocouple 2) Load Cell
- b)** Explain construction and operation of light emitting diode. Write applications of it and explain any one in detail.
- c)** Explain with symbol, equation, truth table following logic gates.
  - a) XOR b) NAND c) NOR d) NOT e) AND

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**F.Y (B. Tech) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Basic Electrical & Electronics Engineering**

Day & Date: Wednesday, 08-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The power taken by a 3 -  $\phi$  load is given by the expression
 

|                      |                             |
|----------------------|-----------------------------|
| a) $3V_{LL}\cos\phi$ | b) $\sqrt{3}V_{LL}\cos\phi$ |
| c) $3V_{LL}\sin\phi$ | d) $\sqrt{3}V_{LL}\sin\phi$ |
- 2) A 3 - phase load is balanced if all the three phases have the same \_\_\_\_\_.
 

|                             |                  |
|-----------------------------|------------------|
| a) Impedance                | b) power factor  |
| c) impedance & power factor | d) none of these |
- 3) With forward bias to a pn junction, the width of depletion layer \_\_\_\_\_.
 

|                     |              |
|---------------------|--------------|
| a) decreases        | b) increases |
| c) remains the same | d) none      |
- 4) PIV in full wave rectifier used in a centre tapped transformer is \_\_\_\_\_.
 

|              |               |
|--------------|---------------|
| a) $V_m/\pi$ | b) $2V_m/\pi$ |
| c) $2V_m$    | d) $V_m$      |
- 5) The collector of transistor is \_\_\_\_\_ doped.
 

|               |            |
|---------------|------------|
| a) Lightly    | b) Heavily |
| c) Moderately | d) None    |
- 6) In transistor \_\_\_\_\_.
 

|                      |                      |
|----------------------|----------------------|
| a) $I_C = I_E + I_B$ | b) $I_B = I_C + I_E$ |
| c) $I_E = I_C - I_B$ | d) $I_E = I_C + I_B$ |
- 7) The gauge factor is defined as
 

|                                  |                                            |
|----------------------------------|--------------------------------------------|
| a) $(\Delta L/L) / (\Delta R/R)$ | b) $(\Delta R/R) / (\Delta L/L)$           |
| c) $(\Delta R/R) / (\Delta D/D)$ | d) $(\Delta R/R) / (\Delta \sigma/\sigma)$ |
- 8) What is moving part of LVDT
 

|              |              |
|--------------|--------------|
| a) Primary   | b) Secondary |
| c) Diaphragm | d) Core      |
- 9) 1's complement of  $(10111010)_2$  is
 

|                   |                |
|-------------------|----------------|
| a) $(01000101)_2$ | b) $(11111)_2$ |
| c) $(010001)_2$   | d) $(1111)_2$  |
- 10) Unit of resistivity is \_\_\_\_\_.
 

|               |                 |
|---------------|-----------------|
| a) $\Omega.m$ | b) $\Omega.m^2$ |
| c) $\Omega$   | d) m            |

- 11) Flux density  $B = ?$
- |                      |                      |
|----------------------|----------------------|
| a) $\mu_o \mu_r / H$ | b) $\mu_o H / \mu_r$ |
| c) $\mu_o \mu_r H$   | d) $(\mu_o)^2 H$     |
- 12) The basic requirement for inducing e.m.f in a coil is that \_\_\_\_.
- a) lux should link the coil
  - b) there should be change in lux linking the coil
  - c) coil should form a closed loop
  - d) none of the above
- 13) The capacitive reactance  $X_c$  \_\_\_\_\_ with \_\_\_\_\_ in frequency.
- |                         |                                 |
|-------------------------|---------------------------------|
| a) Increases, increase  | b) Decreases, decreases         |
| c) Increases, decreases | d) Remains constant, any change |
- 14) For R-L-C series circuit if  $X_L = X_C$  then then power factor  $\cos \phi =$
- |        |        |
|--------|--------|
| a) 1   | b) 0   |
| c) 0.1 | d) 0.5 |

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Set **S**

**F.Y (B. Tech) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Basic Electrical & Electronics Engineering**

Day & Date: Wednesday, 08-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Solve any four.** **16**

- a) Define resistance and discuss the factors on which resistance of conductor material depends.
- b) Two coils connected in series have a resistance of  $18\Omega$  and when connected in parallel have a resistance of  $4\Omega$ . Find the value of resistances.
- c) Explain the term (i) mmf, (ii) Flux, (iii) Permeability, (iv) Reluctance.
- d) Define and derive expression for average value for sinusoidal current in terms of its maximum value.
- e) Derive expression for purely capacitive circuit. Explain concept of capacitive reactance.
- f) Derive the relationship between line and phase quantities in balanced star connected 3 - phase load.

**Q.3 Solve any two.** **12**

- a) Describe the importance of delta - star transformation. If three resistances are connected in delta - connection, then find the equivalent values of these resistances for star – connections.
- b) A coil of resistance  $10\Omega$  and an inductance of  $0.2H$  is connected in series with a capacitor of  $50.7\mu F$ . The circuit is connected across a  $100V$ ,  $50Hz$ , single phase supply. Find i) the current flowing ii) the voltage across capacitors iii) the voltage across the coil iv) power factor of the coil. Draw the phasor diagram.
- c) A flux density of  $1.3T$  is required in  $3.5mm$  air gap of an electromagnet wound with  $550$  turns of wire and having an iron path of  $130cm$ . calculate the current required assuming that a relative permeability of  $1200$  for iron and neglecting the leakage and fringing.

**Section II****Q.4 Solve any four.** **16**

- a) Explain working of BJT as switch.
- b) Explain Full wave rectifier with necessary diagrams.
- c) Convert (DBD)  $H$  to decimal and octal.
- d) What is meant by universal gate? Derive basic gates using NAND and NOR gate.
- e) Explain thermocouple for the measurement of temp. In detail.
- f) Explain VI characteristics of PN junction diode.

**Q.5 Solve any two**

- a)** Explain the following transducer: 1) Thermocouple 2) Load Cell
- b)** Explain construction and operation of light emitting diode. Write applications of it and explain any one in detail.
- c)** Explain with symbol, equation, truth table following logic gates.
  - a) XOR b) NAND c) NOR d) NOT e) AND

**Seat  
No.**

## Max. Marks: 70

- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full mark.

Marks: 14

14



- Page 2 of 16

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Set **P**

**F.Y (B.Tech.) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any three questions.** **09**

- Solve  $(1 + y^2)dx = \{\sqrt{1 + y^2} \sin y - xy\} dy$
- Show that continued product of  $\left(\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^{\frac{3}{4}}$  is 1
- Solve  $(3y + 2x + 4)dx - (4x + 6y + 5)dy = 0$
- Construct an analytic function whose imaginary part is  $v = \sin hx \cos y$
- Test the convergence of  $\sum \frac{n^3+2}{2^{n+2}}$  by using D' Alemberts ratio test.

**Q.3 Answer any three questions.** **09**

- Solve  $\left(xy^2 - e^{-\frac{1}{x^3}}\right) dx - x^2y dy = 0$
- Find the orthogonal trajectory of family of cardioid  $r = a(1 + \cos \theta)$
- Determine  $k$  such that  $f(z) = \frac{1}{2} \log(x^2 + y^2) + i \tan^{-1}\left(\frac{kx}{y}\right)$  is an analytic function.
- Test the convergence of  $\frac{3x}{4} + \left(\frac{4}{5}\right)^2 x^2 + \left(\frac{5}{6}\right)^3 x^3 + \dots + \left(\frac{n+2}{n+3}\right)^n x^n + \dots$  by using Cauchy  $n^{\text{th}}$  root test.
- Construct the analytic function  $f(z) = u + iv$  in terms of  $z$  if,  
 $u + v = e^x(\cos y + \sin y)$

**Q.4 Answer any two questions.** **10**

- When a switch is closed, the current built up in an electric circuit is given by  $L \frac{di}{dt} + Ri = E$  if  $L = 640$ ,  $R = 250$ ,  $E = 500$ , and  $i = 0$  when  $t = 0$ .  
 Show the current will approach 2 amp. When  $t \rightarrow \infty$ .
- Show that  $u = e^x \cos y$  is harmonic function. Find its harmonic conjugate and the corresponding analytic function.
- Test the convergence of  $\frac{1^2}{1^3+1} + \frac{2^2}{2^3+1} + \frac{3^2}{3^3+1} + \dots$  by using comparison test.

## Section – II

**Q.5 Answer any three questions.****09**

- a) Evaluate  $\int_0^2 x^4 (8 - x^3)^{-\frac{1}{3}} dx$
- b) Trace the following curves with full justification  
 $r = a \cos 3\theta$
- c) Evaluate,  $\int_0^\pi x \sin^5 x \cos^8 x dx$
- d) Find by double integration the area between the circles  
 $r = 2 \sin(\theta)$  and  $r = 4 \sin(\theta)$
- e) Evaluate by changing to polar co-ordinates  $\int_0^{4a} \int_{y^2/4a}^y \frac{x^2 - y^2}{x^2 + y^2} dx dy$ .

**Q.6 Attempt any three****09**

- a) Evaluate  $\int_0^\infty x^5 5^{-x} dx$
- b) Evaluate  $\int_{-1}^1 \int_0^z \int_{x-z}^{x+z} y dy dx dz$
- c) In a lamina in the form of ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ , density at any point varies as product of its distance from axis of ellipse. Find the mass.
- d) Trace the following curves with full justification.  $x = t + \sin t$ ,  $y = 1 - \cos t$
- e) Prove that  $\int_0^\infty \frac{\tan^{-1} ax - \tan^{-1} bx}{x} dx = \frac{\pi}{2} \log\left(\frac{a}{b}\right)$  where a is parameter  
 (By using differentiation under integral sign).

**Q.7 Attempt any two****10**

- a) Change the order of integration and Evaluate  $\int_0^\infty \int_0^x e^{\frac{-x^2}{y}} x dx dy$
- b) State and Prove Duplication Formula.
- c) Trace the following curves with full justification.  
 $x y^2 = a (x^2 - a^2)$

**Seat  
No.**

Day & Date: Thursday, 09-03-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full mark.

## Marks: 14

14

- Page 5 of 16

- Page 6 of 16

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| Seat No. |  |
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Set **Q**

**F.Y (B.Tech.) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any three questions.** **09**

- Solve  $(1 + y^2)dx = \{\sqrt{1 + y^2} \sin y - xy\} dy$
- Show that continued product of  $\left(\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^{\frac{3}{4}}$  is 1
- Solve  $(3y + 2x + 4)dx - (4x + 6y + 5)dy = 0$
- Construct an analytic function whose imaginary part is  $v = \sin hx \cos y$
- Test the convergence of  $\sum \frac{n^3+2}{2^{n+2}}$  by using D' Alemberts ratio test.

**Q.3 Answer any three questions.** **09**

- Solve  $\left(xy^2 - e^{-\frac{1}{x^3}}\right) dx - x^2y dy = 0$
- Find the orthogonal trajectory of family of cardioid  $r = a(1 + \cos \theta)$
- Determine  $k$  such that  $f(z) = \frac{1}{2} \log(x^2 + y^2) + i \tan^{-1}\left(\frac{kx}{y}\right)$  is an analytic function.
- Test the convergence of  $\frac{3x}{4} + \left(\frac{4}{5}\right)^2 x^2 + \left(\frac{5}{6}\right)^3 x^3 + \dots + \left(\frac{n+2}{n+3}\right)^n x^n + \dots$  by using Cauchy  $n^{\text{th}}$  root test.
- Construct the analytic function  $f(z) = u + iv$  in terms of  $z$  if,  
 $u + v = e^x(\cos y + \sin y)$

**Q.4 Answer any two questions.** **10**

- When a switch is closed, the current built up in an electric circuit is given by  $L \frac{di}{dt} + Ri = E$  if  $L = 640$ ,  $R = 250$ ,  $E = 500$ , and  $i = 0$  when  $t = 0$ .  
 Show the current will approach 2 amp. When  $t \rightarrow \infty$ .
- Show that  $u = e^x \cos y$  is harmonic function. Find its harmonic conjugate and the corresponding analytic function.
- Test the convergence of  $\frac{1^2}{1^3+1} + \frac{2^2}{2^3+1} + \frac{3^2}{3^3+1} + \dots$  by using comparison test.

## Section – II

**Q.5 Answer any three questions.****09**

- a) Evaluate  $\int_0^2 x^4 (8 - x^3)^{-\frac{1}{3}} dx$
- b) Trace the following curves with full justification  
 $r = a \cos 3\theta$
- c) Evaluate,  $\int_0^\pi x \sin^5 x \cos^8 x dx$
- d) Find by double integration the area between the circles  
 $r = 2 \sin(\theta)$  and  $r = 4 \sin(\theta)$
- e) Evaluate by changing to polar co-ordinates  $\int_0^{4a} \int_{y^2/4a}^y \frac{x^2 - y^2}{x^2 + y^2} dx dy$ .

**Q.6 Attempt any three****09**

- a) Evaluate  $\int_0^\infty x^5 5^{-x} dx$
- b) Evaluate  $\int_{-1}^1 \int_0^z \int_{x-z}^{x+z} y dy dx dz$
- c) In a lamina in the form of ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ , density at any point varies as product of its distance from axis of ellipse. Find the mass.
- d) Trace the following curves with full justification.  $x = t + \sin t$ ,  $y = 1 - \cos t$
- e) Prove that  $\int_0^\infty \frac{\tan^{-1} ax - \tan^{-1} bx}{x} dx = \frac{\pi}{2} \log\left(\frac{a}{b}\right)$  where a is parameter  
 (By using differentiation under integral sign).

**Q.7 Attempt any two****10**

- a) Change the order of integration and Evaluate  $\int_0^\infty \int_0^x e^{\frac{-x^2}{y}} x dx dy$
- b) State and Prove Duplication Formula.
- c) Trace the following curves with full justification.  

$$x y^2 = a (x^2 - a^2)$$

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Day & Date: Thursday, 09-03-2023  
Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full mark.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Value of  $\Gamma(1/2)$  is = \_\_\_\_\_.  
a) 0  
b)  $1/2$   
c)  $\pi$   
d)  $\sqrt{\pi}$
- 2) If  $f(z) = u(x, y) + iv(x, y)$  is an analytic function then it satisfies \_\_\_\_\_.  
a)  $v_x = -u_y$   
b)  $v_y = u_x$   
c) both a & b  
d) None
- 3) If  $\lim_{n \rightarrow \infty} \sqrt[n]{u_n} > 1$  then  $\sum u_n$  is \_\_\_\_\_.  
a) convergent  
b) divergent  
c) oscillatory  
d) none of these
- 4) In the integral  $\int_0^1 \int_0^y \int_0^{x^2 y} f(x, y, z) dx dy dz$  integration is taken \_\_\_\_\_.  
a) first w.r.t.  $z$  then w.r.t.  $y$  then w.r.t.  $x$   
b) first w.r.t.  $z$  then w.r.t.  $x$  then w.r.t.  $y$   
c) first w.r.t.  $x$  then w.r.t.  $y$  then w.r.t.  $z$   
d) first w.r.t.  $y$  then w.r.t.  $y$  then w.r.t.  $x$
- 5) The Orthogonal trajectories of the family of curves  $xy = a$  is \_\_\_\_\_.  
a)  $x^2 - y^2 = c$   
b)  $x^2 + y^2 = c$   
c)  $x = cy$   
d)  $y^2 = 4cx$
- 6) The solution of the differential equation  $x dx + y dy = 0$  is \_\_\_\_\_.  
a)  $xy = c$   
b)  $x + y = c$   
c)  $x^2 y^2 = c$   
d)  $x^2 + y^2 = c$
- 7) The value of  $\int_0^\infty e^{-x^4} dx$  is \_\_\_\_\_.  
a)  $\frac{1}{2} \sqrt{\frac{1}{3}}$   
b)  $\frac{1}{4} \sqrt{\frac{1}{4}}$   
c)  $\frac{1}{4} \sqrt{\frac{1}{3}}$   
d)  $\frac{1}{3} \sqrt{\frac{1}{4}}$



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| Seat No. |  |
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Set **R**

**F.Y (B.Tech.) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any three questions.** **09**

- Solve  $(1 + y^2)dx = \{\sqrt{1 + y^2} \sin y - xy\} dy$
- Show that continued product of  $\left(\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^{\frac{3}{4}}$  is 1
- Solve  $(3y + 2x + 4)dx - (4x + 6y + 5)dy = 0$
- Construct an analytic function whose imaginary part is  $v = \sin hx \cos y$
- Test the convergence of  $\sum \frac{n^3+2}{2^{n+2}}$  by using D' Alemberts ratio test.

**Q.3 Answer any three questions.** **09**

- Solve  $\left(xy^2 - e^{-\frac{1}{x^3}}\right) dx - x^2y dy = 0$
- Find the orthogonal trajectory of family of cardioid  $r = a(1 + \cos \theta)$
- Determine  $k$  such that  $f(z) = \frac{1}{2} \log(x^2 + y^2) + i \tan^{-1}\left(\frac{kx}{y}\right)$  is an analytic function.
- Test the convergence of  $\frac{3x}{4} + \left(\frac{4}{5}\right)^2 x^2 + \left(\frac{5}{6}\right)^3 x^3 + \dots + \left(\frac{n+2}{n+3}\right)^n x^n + \dots$  by using Cauchy  $n^{\text{th}}$  root test.
- Construct the analytic function  $f(z) = u + iv$  in terms of  $z$  if,  
 $u + v = e^x(\cos y + \sin y)$

**Q.4 Answer any two questions.** **10**

- When a switch is closed, the current built up in an electric circuit is given by  $L \frac{di}{dt} + Ri = E$  if  $L = 640$ ,  $R = 250$ ,  $E = 500$ , and  $i = 0$  when  $t = 0$ .  
 Show the current will approach 2 amp. When  $t \rightarrow \infty$ .
- Show that  $u = e^x \cos y$  is harmonic function. Find its harmonic conjugate and the corresponding analytic function.
- Test the convergence of  $\frac{1^2}{1^3+1} + \frac{2^2}{2^3+1} + \frac{3^2}{3^3+1} + \dots$  by using comparison test.

## Section – II

**Q.5 Answer any three questions.****09**

- a) Evaluate  $\int_0^2 x^4 (8 - x^3)^{-\frac{1}{3}} dx$
- b) Trace the following curves with full justification  
 $r = a \cos 3\theta$
- c) Evaluate,  $\int_0^\pi x \sin^5 x \cos^8 x dx$
- d) Find by double integration the area between the circles  
 $r = 2 \sin(\theta)$  and  $r = 4 \sin(\theta)$
- e) Evaluate by changing to polar co-ordinates  $\int_0^{4a} \int_{y^2/4a}^y \frac{x^2 - y^2}{x^2 + y^2} dx dy$ .

**Q.6 Attempt any three****09**

- a) Evaluate  $\int_0^\infty x^5 5^{-x} dx$
- b) Evaluate  $\int_{-1}^1 \int_0^z \int_{x-z}^{x+z} y dy dx dz$
- c) In a lamina in the form of ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ , density at any point varies as product of its distance from axis of ellipse. Find the mass.
- d) Trace the following curves with full justification.  $x = t + \sin t$ ,  $y = 1 - \cos t$
- e) Prove that  $\int_0^\infty \frac{\tan^{-1} ax - \tan^{-1} bx}{x} dx = \frac{\pi}{2} \log\left(\frac{a}{b}\right)$  where a is parameter  
 (By using differentiation under integral sign).

**Q.7 Attempt any two****10**

- a) Change the order of integration and Evaluate  $\int_0^\infty \int_0^x e^{\frac{-x^2}{y}} x dx dy$
- b) State and Prove Duplication Formula.
- c) Trace the following curves with full justification.  
 $x y^2 = a (x^2 - a^2)$

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Day & Date: Thursday, 09-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full mark.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) A double point is called a node if the two tangents there are \_\_\_\_\_.  
a) Coincident  
b) imaginary  
c) real and distinct  
d) none of these
- 2)  $\left[ \sin\left(\frac{\pi}{3}\right) + i \cos\left(\frac{\pi}{3}\right) \right]^4$  is equal to \_\_\_\_\_.  
a)  $\sin\frac{4\pi}{3} + i \cos\frac{4\pi}{3}$   
b)  $\sin\frac{\pi}{12} + i \cos\frac{\pi}{12}$   
c)  $-i \sin\frac{2\pi}{3} + \cos\frac{2\pi}{3}$   
d)  $\cos\frac{2\pi}{3} + i \sin\frac{2\pi}{3}$
- 3) If the differential equation  $(x^4 e^x - 2mxy^2)dx + 4x^2 y dy = 0$  is exact then the value of  $m =$  \_\_\_\_\_.  
a) 1  
b) -4  
c) -1  
d) -2
- 4)  $\sin(ix)$  is equal to \_\_\_\_\_.  
a)  $\sinh x$   
b)  $i \sin x$   
c)  $-\sin ix$   
d)  $i \sinh x$
- 5)  $\int_0^{\frac{\pi}{2}} \int_0^1 r^3 \sin \theta \cdot \cos \theta \, dr \cdot d\theta$   
a)  $\pi/4$   
b)  $\pi/8$   
c)  $1/8$   
d)  $1/4$
- 6) Value of  $\Gamma(1/2)$  is \_\_\_\_\_.  
a) 0  
b)  $1/2$   
c)  $\pi$   
d)  $\sqrt{\pi}$
- 7) If  $f(z) = u(x, y) + iv(x, y)$  is an analytic function then it satisfies \_\_\_\_\_.  
a)  $v_x = -u_y$   
b)  $v_y = u_x$   
c) both a & b  
d) None

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Set **S**

**F.Y (B.Tech.) (Sem-II) (CBCS) Examination: Oct/Nov-2022**  
**Engineering Mathematics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer any three questions.** **09**

- Solve  $(1 + y^2)dx = \{\sqrt{1 + y^2} \sin y - xy\} dy$
- Show that continued product of  $\left(\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^{\frac{3}{4}}$  is 1
- Solve  $(3y + 2x + 4)dx - (4x + 6y + 5)dy = 0$
- Construct an analytic function whose imaginary part is  $v = \sin hx \cos y$
- Test the convergence of  $\sum \frac{n^3+2}{2^{n+2}}$  by using D' Alemberts ratio test.

**Q.3 Answer any three questions.** **09**

- Solve  $(xy^2 - e^{-\frac{1}{x^3}}) dx - x^2y dy = 0$
- Find the orthogonal trajectory of family of cardioid  $r = a(1 + \cos \theta)$
- Determine  $k$  such that  $f(z) = \frac{1}{2} \log(x^2 + y^2) + i \tan^{-1}\left(\frac{ky}{x}\right)$  is an analytic function.
- Test the convergence of  $\frac{3x}{4} + \left(\frac{4}{5}\right)^2 x^2 + \left(\frac{5}{6}\right)^3 x^3 + \dots + \left(\frac{n+2}{n+3}\right)^n x^n + \dots$  by using Cauchy  $n^{\text{th}}$  root test.
- Construct the analytic function  $f(z) = u + iv$  in terms of  $z$  if,  
 $u + v = e^x(\cos y + \sin y)$

**Q.4 Answer any two questions.** **10**

- When a switch is closed, the current built up in an electric circuit is given by  $L \frac{di}{dt} + Ri = E$  if  $L = 640$ ,  $R = 250$ ,  $E = 500$ , and  $i = 0$  when  $t = 0$ .  
 Show the current will approach 2 amp. When  $t \rightarrow \infty$ .
- Show that  $u = e^x \cos y$  is harmonic function. Find its harmonic conjugate and the corresponding analytic function.
- Test the convergence of  $\frac{1^2}{1^3+1} + \frac{2^2}{2^3+1} + \frac{3^2}{3^3+1} + \dots$  by using comparison test.

## Section – II

**Q.5 Answer any three questions.****09**

- a) Evaluate  $\int_0^2 x^4 (8 - x^3)^{-\frac{1}{3}} dx$
- b) Trace the following curves with full justification  
 $r = a \cos 3\theta$
- c) Evaluate,  $\int_0^\pi x \sin^5 x \cos^8 x dx$
- d) Find by double integration the area between the circles  
 $r = 2 \sin(\theta)$  and  $r = 4 \sin(\theta)$
- e) Evaluate by changing to polar co-ordinates  $\int_0^{4a} \int_{y^2/4a}^y \frac{x^2 - y^2}{x^2 + y^2} dx dy$ .

**Q.6 Attempt any three****09**

- a) Evaluate  $\int_0^\infty x^5 5^{-x} dx$
- b) Evaluate  $\int_{-1}^1 \int_0^z \int_{x-z}^{x+z} y dy dx dz$
- c) In a lamina in the form of ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ , density at any point varies as product of its distance from axis of ellipse. Find the mass.
- d) Trace the following curves with full justification.  $x = t + \sin t$ ,  $y = 1 - \cos t$
- e) Prove that  $\int_0^\infty \frac{\tan^{-1} ax - \tan^{-1} bx}{x} dx = \frac{\pi}{2} \log\left(\frac{a}{b}\right)$  where a is parameter  
 (By using differentiation under integral sign).

**Q.7 Attempt any two****10**

- a) Change the order of integration and Evaluate  $\int_0^\infty \int_0^x e^{\frac{-x^2}{y}} x dx dy$
- b) State and Prove Duplication Formula.
- c) Trace the following curves with full justification.  
 $xy^2 = a(x^2 - a^2)$

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Day & Date: Friday, 10-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

3) Figures to the right indicate full marks

**Constants:** 1) Avogadro's no.,  $N = 6.02 \times 10^{26}$  / k.mol.

2) Velocity of light,  $c = 3 \times 10^8 \text{ m/sec.}$

3) Charge of electron,  $e = 1.6 \times 10^{-19} \text{ C}$ .

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Acceptor type of semiconductor is formed by adding impurity from \_\_\_\_ group.

|      |      |
|------|------|
| a) 3 | b) 5 |
| c) 4 | d) 6 |
- 2) In conductor, current flows due to \_\_\_\_\_.

|              |                               |
|--------------|-------------------------------|
| a) electrons | b) both - holes and electrons |
| c) protons   | d) holes                      |
- 3) The void space for BCC structure is \_\_\_\_\_.

|         |         |
|---------|---------|
| a) 30 % | b) 32 % |
| c) 35 % | d) 48 % |
- 4) The co-ordination number in case of FCC structure is \_\_\_\_\_.

|      |       |
|------|-------|
| a) 6 | b) 12 |
| c) 8 | d) 10 |
- 5) The absorption coefficient is measured in \_\_\_\_\_.

|        |        |
|--------|--------|
| a) WOU | b) OWU |
| c) m/s | d) UOW |
- 6) The ultrasonic wave's exhibit \_\_\_\_\_.

|                                  |                                  |
|----------------------------------|----------------------------------|
| a) Very long wavelength          | b) Large diffraction effect      |
| c) Negligible diffraction effect | d) Faster speed than light waves |
- 7) The length of the rod moving with velocity  $v$  relative to the observer is same when \_\_\_\_\_.

|               |                             |
|---------------|-----------------------------|
| a) $v \ll c$  | b) $v$ is comparable to $c$ |
| c) $v \geq c$ | d) $v = 0$                  |
- 8) Maximum number of orders possible with a grating is \_\_\_\_\_.

|                                                     |
|-----------------------------------------------------|
| a) independent of grating element                   |
| b) directly proportional to grating element         |
| c) Inversely proportional to grating element        |
| d) directly proportional to the wavelength of light |





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**Set**

**P**

**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING PHYSICS**

Day & Date: Friday, 10-03-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Make suitable assumptions, if necessary.  
3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Six)**

**18**

- Define atomic radius and obtain its values for SC and BCC.
- Derive an expression for Fermi energy in intrinsic semiconductors.  
$$E_F = \frac{E_g}{2}$$
- Classify: conductor, insulator and semiconductor on the basis of energy band structure.
- State: Properties of ultrasonic waves.
- Derive an expression for Length contraction.
- State and explain: Sabine Formula.
- A classroom has dimensions 20 x 15 x 5 m<sup>3</sup>. The reverberation time is 3.5 sec. Calculate the total absorption of its surfaces and the average absorption coefficient.
- Polonium belongs to SC lattice. If the lattice constant is 3.36Å<sup>0</sup>, calculate its density. The atomic mass of polonium is 209.

**Q.3 Answer the following questions. (Any Two)**

**10**

- What is Hall effect? Derive the relation for Hall voltage (V<sub>H</sub>) and Hall coefficient (R<sub>H</sub>).
- Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

- State and explain the factors affecting architectural acoustics and their remedies.
- Derive an expression for E = m.c<sup>2</sup>
  - A rod has length 100 cm. When the rod is in a satellite moving with a velocity that is one half of the velocity of light relative to laboratory. What is the length of the rod as determined by an observer
    - in the satellite and
    - in the laboratory

**Section – II**

- Q.4 Answer the following questions. (Any Six) 18**
- a) Derive an expression for the resolving power of a plane diffraction grating.
  - b) Distinguish between positive and negative crystals.
  - c) Explain in brief:
    - 1) Stimulated Emission and
    - 2) Spontaneous Emission
  - d) Write properties of LASER.
  - e) Explain structure of optical fibers with neat labeled diagrams.
  - f) Give applications of nanotechnology in different fields.
  - g) Calculate the numerical aperture and acceptance angle for an optical fibre with core and cladding refractive indices being 1.5 and 1.4 respectively.
  - h) Calculate the De-Broglie wavelength of electron traversing through the potential of 100V (Given:  $h = 6.63 \times 10^{-34} \text{ Js}$ ,  $m = 9.1 \times 10^{-31} \text{ kg}$ )
- Q.5 Answer the following questions. (Any Two) 10**
- a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.
  - b) Describe Laurent's half shade polarimeter for the determination of specific rotation of the substance.
  - c)
    - 1) Calculate specific rotation, if the plane of polarization is rotated through  $22^\circ$ . Length of tube is 20 cm. Given: Density of solution 20%.
    - 2) What is the highest order spectrum which may be seen with monochromatic light of wavelength  $6000 \times 10^{-8} \text{ cm}$  by means of diffraction grating with 5000 lines per cm.
  - d) Describe He-Ne laser with its construction and working.

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| <b>Set Q</b> |
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**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING PHYSICS**

Day & Date: Friday, 10-03-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

- Constants:** 1) Avogadro's no.,  $N = 6.02 \times 10^{26}$  / k.mol.  
2) Velocity of light,  $c = 3 \times 10^8$  m/sec.  
3) Charge of electron,  $e = 1.6 \times 10^{-19}$  C.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Maximum number of orders possible with a grating is \_\_\_\_\_.  
a) independent of grating element  
b) directly proportional to grating element  
c) Inversely proportional to grating element  
d) directly proportional to the wavelength of light
- 2) Light waves are transverse in nature, can be demonstrated by observing the phenomenon of \_\_\_\_\_.  
a) Dispersion  
b) Diffraction  
c) Polarization  
d) Interference
- 3) Holography means \_\_\_\_\_.  
a) To get 2D image of 3D object  
b) To get zero dimension image  
c) To get 3D image of 3D object  
d) To get 3D image of 2D object
- 4) Stimulated emission process is represented by equation \_\_\_\_\_.  
a)  $A^* \rightarrow A + h\nu$   
b)  $A^* + h\nu \rightarrow A + 2h\nu$   
c)  $A + h\nu \rightarrow A^*$   
d)  $A^* + h\nu \rightarrow A + h\nu$
- 5) In total internal reflection phenomenon, the light ray incident from \_\_\_\_\_.  
a) Rarer to denser  
b) Denser to denser  
c) Rarer to rarer  
d) Denser to rarer
- 6) Single Wall Carbon Nanotubes (SWCNT) have diameters ranging from \_\_\_\_\_.  
a) 2 to 25 nm  
b) 1 to 25 nm  
c) 2 to 50 nm  
d) 1 to 2 nm
- 7) Which of the following proved the De Broglie equation was correct?  
a) Planks equation  
b) Quantum mechanics  
c) Einstein's theory of relativity  
d) Davisson Germer experiment



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**Set Q**

**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING PHYSICS**

Day & Date: Friday, 10-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Make suitable assumptions, if necessary.  
3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Six)** **18**

- Define atomic radius and obtain its values for SC and BCC.
- Derive an expression for Fermi energy in intrinsic semiconductors.  
$$E_F = \frac{E_g}{2}$$
- Classify: conductor, insulator and semiconductor on the basis of energy band structure.
- State: Properties of ultrasonic waves.
- Derive an expression for Length contraction.
- State and explain: Sabine Formula.
- A classroom has dimensions 20 x 15 x 5 m<sup>3</sup>. The reverberation time is 3.5 sec. Calculate the total absorption of its surfaces and the average absorption coefficient.
- Polonium belongs to SC lattice. If the lattice constant is 3.36Å<sup>0</sup>, calculate its density. The atomic mass of polonium is 209.

**Q.3 Answer the following questions. (Any Two)** **10**

- What is Hall effect? Derive the relation for Hall voltage (V<sub>H</sub>) and Hall coefficient (R<sub>H</sub>).
- Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

- State and explain the factors affecting architectural acoustics and their remedies.
- Derive an expression for E = m.c<sup>2</sup>
  - A rod has length 100 cm. When the rod is in a satellite moving with a velocity that is one half of the velocity of light relative to laboratory. What is the length of the rod as determined by an observer
    - in the satellite and
    - in the laboratory

**Section – II**

**Q.4 Answer the following questions. (Any Six) 18**

- a) Derive an expression for the resolving power of a plane diffraction grating.
- b) Distinguish between positive and negative crystals.
- c) Explain in brief:
  - 1) Stimulated Emission and
  - 2) Spontaneous Emission
- d) Write properties of LASER.
- e) Explain structure of optical fibers with neat labeled diagrams.
- f) Give applications of nanotechnology in different fields.
- g) Calculate the numerical aperture and acceptance angle for an optical fibre with core and cladding refractive indices being 1.5 and 1.4 respectively.
- h) Calculate the De-Broglie wavelength of electron traversing through the potential of 100V (Given:  $h = 6.63 \times 10^{-34} \text{ Js}$ ,  $m = 9.1 \times 10^{-31} \text{ kg}$ )

**Q.5 Answer the following questions. (Any Two) 10**

- a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.
- b) Describe Laurent's half shade polarimeter for the determination of specific rotation of the substance.
- c)
  - 1) Calculate specific rotation, if the plane of polarization is rotated through  $22^\circ$ . Length of tube is 20 cm. Given: Density of solution 20%.
  - 2) What is the highest order spectrum which may be seen with monochromatic light of wavelength  $6000 \times 10^{-8} \text{ cm}$  by means of diffraction grating with 5000 lines per cm.
- d) Describe He-Ne laser with its construction and working.

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Day & Date: Friday, 10-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

3) Figures to the right indicate full marks

**Constants:** 1) Avogadro's no.,  $N = 6.02 \times 10^{26}$  / k.mol.

2) Velocity of light,  $c = 3 \times 10^8$  m/sec.

3) Charge of electron,  $e = 1.6 \times 10^{-19} \text{ C}$ .

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Stimulated emission process is represented by equation \_\_\_\_\_.  
a)  $A^* \rightarrow A + h\nu$   
b)  $A^* + h\nu \rightarrow A + 2h\nu$   
c)  $A + h\nu \rightarrow A^*$   
d)  $A^* + h\nu \rightarrow A + h\nu$
- 2) In total internal reflection phenomenon, the light ray incident from \_\_\_\_\_.  
a) Rarer to denser  
b) Denser to denser  
c) Rarer to rarer  
d) Denser to rarer
- 3) Single Wall Carbon Nanotubes (SWCNT) have diameters ranging from \_\_\_\_\_.  
a) 2 to 25 nm  
b) 1 to 25 nm  
c) 2 to 50 nm  
d) 1 to 2 nm
- 4) Which of the following proved the De Broglie equation was correct?  
a) Planks equation  
b) Quantum mechanics  
c) Einstein's theory of relativity  
d) Davisson Germer experiment
- 5) Acceptor type of semiconductor is formed by adding impurity from \_\_\_\_\_ group.  
a) 3  
b) 5  
c) 4  
d) 6
- 6) In conductor, current flows due to \_\_\_\_\_.  
a) electrons  
b) both - holes and electrons  
c) protons  
d) holes
- 7) The void space for BCC structure is \_\_\_\_\_.  
a) 30 %  
b) 32 %  
c) 35 %  
d) 48 %
- 8) The co-ordination number in case of FCC structure is \_\_\_\_\_.  
a) 6  
b) 12  
c) 8  
d) 10





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**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING PHYSICS**

Day & Date: Friday, 10-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Make suitable assumptions, if necessary.  
3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Six)** **18**

- Define atomic radius and obtain its values for SC and BCC.
- Derive an expression for Fermi energy in intrinsic semiconductors.  
$$E_F = \frac{E_g}{2}$$
- Classify: conductor, insulator and semiconductor on the basis of energy band structure.
- State: Properties of ultrasonic waves.
- Derive an expression for Length contraction.
- State and explain: Sabine Formula.
- A classroom has dimensions 20 x 15 x 5 m<sup>3</sup>. The reverberation time is 3.5 sec. Calculate the total absorption of its surfaces and the average absorption coefficient.
- Polonium belongs to SC lattice. If the lattice constant is 3.36Å<sup>0</sup>, calculate its density. The atomic mass of polonium is 209.

**Q.3 Answer the following questions. (Any Two)** **10**

- What is Hall effect? Derive the relation for Hall voltage (V<sub>H</sub>) and Hall coefficient (R<sub>H</sub>).
- Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

- State and explain the factors affecting architectural acoustics and their remedies.
- Derive an expression for E = m.c<sup>2</sup>
  - A rod has length 100 cm. When the rod is in a satellite moving with a velocity that is one half of the velocity of light relative to laboratory. What is the length of the rod as determined by an observer
    - in the satellite and
    - in the laboratory

**Section – II**

**Q.4 Answer the following questions. (Any Six) 18**

- a) Derive an expression for the resolving power of a plane diffraction grating.
- b) Distinguish between positive and negative crystals.
- c) Explain in brief:
  - 1) Stimulated Emission and
  - 2) Spontaneous Emission
- d) Write properties of LASER.
- e) Explain structure of optical fibers with neat labeled diagrams.
- f) Give applications of nanotechnology in different fields.
- g) Calculate the numerical aperture and acceptance angle for an optical fibre with core and cladding refractive indices being 1.5 and 1.4 respectively.
- h) Calculate the De-Broglie wavelength of electron traversing through the potential of 100V (Given:  $h = 6.63 \times 10^{-34} \text{ Js}$ ,  $m = 9.1 \times 10^{-31} \text{ kg}$ )

**Q.5 Answer the following questions. (Any Two) 10**

- a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.
- b) Describe Laurent's half shade polarimeter for the determination of specific rotation of the substance.
- c)
  - 1) Calculate specific rotation, if the plane of polarization is rotated through  $22^\circ$ . Length of tube is 20 cm. Given: Density of solution 20%.
  - 2) What is the highest order spectrum which may be seen with monochromatic light of wavelength  $6000 \times 10^{-8} \text{ cm}$  by means of diffraction grating with 5000 lines per cm.
- d) Describe He-Ne laser with its construction and working.

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S

**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING PHYSICS**

Day & Date: Friday, 10-03-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

- Constants:** 1) Avogadro's no.,  $N = 6.02 \times 10^{26}$  / k.mol.  
2) Velocity of light,  $c = 3 \times 10^8$  m/sec.  
3) Charge of electron,  $e = 1.6 \times 10^{-19}$  C.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The ultrasonic wave's exhibit \_\_\_\_\_.  
a) Very long wavelength      b) Large diffraction effect  
c) Negligible diffraction effect      d) Faster speed than light waves
- 2) The length of the rod moving with velocity  $v$  relative to the observer is same when \_\_\_\_\_.  
a)  $v \ll c$       b)  $v$  is comparable to  $c$   
c)  $v \geq c$       d)  $v = 0$
- 3) Maximum number of orders possible with a grating is \_\_\_\_\_.  
a) independent of grating element  
b) directly proportional to grating element  
c) Inversely proportional to grating element  
d) directly proportional to the wavelength of light
- 4) Light waves are transverse in nature, can be demonstrated by observing the phenomenon of \_\_\_\_\_.  
a) Dispersion      b) Diffraction  
c) Polarization      d) Interference
- 5) Holography means \_\_\_\_\_.  
a) To get 2D image of 3D object      b) To get zero dimension image  
c) To get 3D image of 3D object      d) To get 3D image of 2D object
- 6) Stimulated emission process is represented by equation \_\_\_\_\_.  
a)  $A^* \rightarrow A + h\nu$       b)  $A^* + h\nu \rightarrow A + 2h\nu$   
c)  $A + h\nu \rightarrow A^*$       d)  $A^* + h\nu \rightarrow A + h\nu$
- 7) In total internal reflection phenomenon, the light ray incident from \_\_\_\_\_.  
a) Rarer to denser      b) Denser to denser  
c) Rarer to rarer      d) Denser to rarer



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**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING PHYSICS**

Day & Date: Friday, 10-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Make suitable assumptions, if necessary.  
3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Six)** **18**

- Define atomic radius and obtain its values for SC and BCC.
- Derive an expression for Fermi energy in intrinsic semiconductors.  
$$E_F = \frac{E_g}{2}$$
- Classify: conductor, insulator and semiconductor on the basis of energy band structure.
- State: Properties of ultrasonic waves.
- Derive an expression for Length contraction.
- State and explain: Sabine Formula.
- A classroom has dimensions 20 x 15 x 5 m<sup>3</sup>. The reverberation time is 3.5 sec. Calculate the total absorption of its surfaces and the average absorption coefficient.
- Polonium belongs to SC lattice. If the lattice constant is 3.36Å<sup>0</sup>, calculate its density. The atomic mass of polonium is 209.

**Q.3 Answer the following questions. (Any Two)** **10**

- What is Hall effect? Derive the relation for Hall voltage (V<sub>H</sub>) and Hall coefficient (R<sub>H</sub>).
- Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

- State and explain the factors affecting architectural acoustics and their remedies.
- Derive an expression for E = m.c<sup>2</sup>
  - A rod has length 100 cm. When the rod is in a satellite moving with a velocity that is one half of the velocity of light relative to laboratory. What is the length of the rod as determined by an observer
    - in the satellite and
    - in the laboratory

**Section – II**

**Q.4 Answer the following questions. (Any Six) 18**

- a) Derive an expression for the resolving power of a plane diffraction grating.
- b) Distinguish between positive and negative crystals.
- c) Explain in brief:
  - 1) Stimulated Emission and
  - 2) Spontaneous Emission
- d) Write properties of LASER.
- e) Explain structure of optical fibers with neat labeled diagrams.
- f) Give applications of nanotechnology in different fields.
- g) Calculate the numerical aperture and acceptance angle for an optical fibre with core and cladding refractive indices being 1.5 and 1.4 respectively.
- h) Calculate the De-Broglie wavelength of electron traversing through the potential of 100V (Given:  $h = 6.63 \times 10^{-34} \text{ Js}$ ,  $m = 9.1 \times 10^{-31} \text{ kg}$ )

**Q.5 Answer the following questions. (Any Two) 10**

- a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.
- b) Describe Laurent's half shade polarimeter for the determination of specific rotation of the substance.
- c)
  - 1) Calculate specific rotation, if the plane of polarization is rotated through  $22^\circ$ . Length of tube is 20 cm. Given: Density of solution 20%.
  - 2) What is the highest order spectrum which may be seen with monochromatic light of wavelength  $6000 \times 10^{-8} \text{ cm}$  by means of diffraction grating with 5000 lines per cm.
- d) Describe He-Ne laser with its construction and working.

## Set

P

**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING CHEMISTRY**

Day & Date: Friday, 10-03-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

3) Figures to the right indicate full marks

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The process of removing extra common salt from water is called: \_\_\_\_\_.  
a) deionization                      b) softening  
c) disinfections                      d) desalination
- 2) Hard water is unfit for use in boilers for "steam raising" because: \_\_\_\_\_.  
a) its boiling point is higher  
b) steam is generated at a high pressure  
c) it leads to scale formation inside boiler  
d) water undergoes decomposition into oxygen and hydrogen
- 3) A lubricant is used primarily to prevent: \_\_\_\_\_.  
a) corrosion of metals  
b) oxidation of metals  
c) reduction of metals  
d) wearing out of rubbing metallic surfaces
- 4) Animal and vegetable oils are : \_\_\_\_\_.  
a) very cheap                      b) not oxidized easily  
c) not thickened in use                      d) good in oiliness
- 5) Metal at the top of electrochemical series is : \_\_\_\_\_.  
a) most stable                      b) least active  
c) most noble                      d) most active
- 6) During wet corrosion \_\_\_\_\_.  
a) Anodic part undergoes oxidation  
b) Cathodic part undergoes oxidation  
c) Anodic part undergoes reduction  
d) Neither anodic nor cathodic part undergoes any change
- 7) Purest form of iron is : \_\_\_\_\_.  
a) steel                      b) wrought iron  
c) pig iron                      d) cast iron
- 8) The main constituent of safety glass is: \_\_\_\_\_.  
a) CaCO<sub>3</sub>                      b) PbO  
c) vinyl plastic                      d) boron



- 9) A good fuel should have: \_\_\_\_\_.  
a) high moisture content      b) low calorific value  
c) moderate ignition temperature      d) high ash content
- 10) Charcoal is a secondary fuel derived from \_\_\_\_\_.  
a) Wood      b) Lignite  
c) Petroleum      d) Coke
- 11) A thermoplastic is formed by the phenomenon of : \_\_\_\_\_.  
a) Chlorination      b) condensation polymerization  
c) Nitration      d) chain polymerization
- 12) Natural rubber is basically a polymer of: \_\_\_\_\_.  
a) isoprene      b) propylene  
c) ethylene      d) propane
- 13) The commonly used carrier gas in GLC is \_\_\_\_\_.  
a)  $F_2$       b)  $Br_2$   
c)  $Cl_2$       d)  $N_2$
- 14) A fuel cell is used to convert chemical energy into \_\_\_\_\_.  
a) Mechanical energy      b) Solar energy  
c) Electrical energy      d) Potential energy

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**Set**

**P**

**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING CHEMISTRY**

Day & Date: Friday, 10-03-2023

Max. Marks: 56

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Draw neat and labeled diagrams wherever necessary.  
3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Four)**

**16**

- a) A sample of water on analysis was found to contain the following impurities in mg/lit:

|                                    | Amount | Mo. Wt. |
|------------------------------------|--------|---------|
| Ca(HCO <sub>3</sub> ) <sub>2</sub> | 30.15  | 162     |
| Mg(HCO <sub>3</sub> ) <sub>2</sub> | 28.73  | 146     |
| CaSO <sub>4</sub>                  | 27.00  | 136     |
| MgCl <sub>2</sub>                  | 26.5   | 95      |

Calculate the temporary, permanent and total hardness of water in mg/lit.

- b) Define aeration. Explain different types of aerators.  
c) Define disinfection. Explain disinfection of water by chlorine, Chloramine and bleaching powder.  
d) Define following terms.  
1) Viscosity Index  
2) Acid Value  
3) Flash point  
4) Aniline Point  
e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.  
f) Explain factors affecting on rate of corrosion.

**Q.3 Answer the following questions. (Any Four)**

**12**

- a) Define BOD. How it is determined. Explain its importance.  
b) Explain characteristics of batteries.  
c) Explain solid lubricants.  
d) 6 gm of an oil sample after saponification with 60 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titer value of 15 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 60 ml. Calculate saponification value of an oil sample.  
e) Define Lubricant. Explain its functions.  
f) Explain prevention of corrosion by tinning.

**Section – II**

**Q.4 Answer the following questions. (Any Four)**

**16**

- a) Explain composition, properties and applications of cast iron, steel and wrought iron.
- b) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:  
Volume of the gaseous fuel burnt at STP =  $0.12 \text{ m}^3$   
Weight of water used for cooling = 36.2 Kg  
Weight of steam condensed = 0.031 Kg  
Temperature of Inlet water =  $24.2^\circ\text{C}$   
Temperature of Outlet water =  $39.3^\circ\text{C}$   
Determine the gross and net calorific values of gaseous fuel.  
(Take latent heat of condensation of steam = 587 kcal/kg)
- c) Explain construction and working of bomb calorimeter.
- d) Explain molding of plastics in to articles by following methods.
  - 1) Extrusion molding
  - 2) Injection molding
- e) Explain properties and applications of PVC and PET.
- f) Explain components and instrumentation of GLC with labelled diagram.

**Q.5 Answer the following questions. (Any Four)**

**12**

- a) Explain any three types of glass.
- b) Compare solid and gaseous fuels.
- c) Summarize advantages and disadvantages of biodiesel.
- d) Explain vulcanization of natural rubber.
- e) Calculate Degree of polymerization of polyethene having molecular weight 18200. (Mol. Wt. of ethene = 28)
- f) Calculate weight of  $\text{MgSO}_4$  required to prepare 0.4 N 500 ml solution. (Mol. Wt. of  $\text{MgSO}_4$  = 120)

| Set | Q |
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**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING CHEMISTRY**

Day & Date: Friday, 10-03-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

3) Figures to the right indicate full marks

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The main constituent of safety glass is: \_\_\_\_\_.  
a)  $\text{CaCO}_3$                                       b)  $\text{PbO}$   
c) vinyl plastic                                  d) boron
- 2) A good fuel should have: \_\_\_\_\_.  
a) high moisture content                      b) low calorific value  
c) moderate ignition temperature        d) high ash content
- 3) Charcoal is a secondary fuel derived from \_\_\_\_\_.  
a) Wood                                              b) Lignite  
c) Petroleum                                        d) Coke
- 4) A thermoplastic is formed by the phenomenon of : \_\_\_\_\_.  
a) Chlorination                                  b) condensation polymerization  
c) Nitration                                         d) chain polymerization
- 5) Natural rubber is basically a polymer of: \_\_\_\_\_.  
a) isoprene                                         b) propylene  
c) ethylene                                         d) propane
- 6) The commonly used carrier gas in GLC is \_\_\_\_\_.  
a)  $\text{F}_2$                                                  b)  $\text{Br}_2$   
c)  $\text{Cl}_2$                                                 d)  $\text{N}_2$
- 7) A fuel cell is used to convert chemical energy into \_\_\_\_\_.  
a) Mechanical energy                          b) Solar energy  
c) Electrical energy                              d) Potential energy
- 8) The process of removing extra common salt from water is called: \_\_\_\_\_.  
a) deionization                                    b) softening  
c) disinfections                                   d) desalination
- 9) Hard water is unfit for use in boilers for "steam raising" because: \_\_\_\_\_.  
a) its boiling point is higher  
b) steam is generated at a high pressure  
c) it leads to scale formation inside boiler  
d) water undergoes decomposition into oxygen and hydrogen

- 10)** A lubricant is used primarily to prevent: \_\_\_\_\_.  
a) corrosion of metals  
b) oxidation of metals  
c) reduction of metals  
d) wearing out of rubbing metallic surfaces
- 11)** Animal and vegetable oils are : \_\_\_\_\_.  
a) very cheap  
b) not oxidized easily  
c) not thickened in use  
d) good in oiliness
- 12)** Metal at the top of electrochemical series is : \_\_\_\_\_.  
a) most stable  
b) least active  
c) most noble  
d) most active
- 13)** During wet corrosion \_\_\_\_\_.  
a) Anodic part undergoes oxidation  
b) Cathodic part undergoes oxidation  
c) Anodic part undergoes reduction  
d) Neither anodic nor cathodic part undergoes any change
- 14)** Purest form of iron is : \_\_\_\_\_.  
a) steel  
b) wrought iron  
c) pig iron  
d) cast iron

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**Set Q**

**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING CHEMISTRY**

Day & Date: Friday, 10-03-2023  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Draw neat and labeled diagrams wherever necessary.  
3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Four) 16**

- a) A sample of water on analysis was found to contain the following impurities in mg/lit:

|                                    | Amount | Mo. Wt. |
|------------------------------------|--------|---------|
| Ca(HCO <sub>3</sub> ) <sub>2</sub> | 30.15  | 162     |
| Mg(HCO <sub>3</sub> ) <sub>2</sub> | 28.73  | 146     |
| CaSO <sub>4</sub>                  | 27.00  | 136     |
| MgCl <sub>2</sub>                  | 26.5   | 95      |

Calculate the temporary, permanent and total hardness of water in mg/lit.

- b) Define aeration. Explain different types of aerators.  
c) Define disinfection. Explain disinfection of water by chlorine, Chloramine and bleaching powder.  
d) Define following terms.  
1) Viscosity Index  
2) Acid Value  
3) Flash point  
4) Aniline Point  
e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.  
f) Explain factors affecting on rate of corrosion.

**Q.3 Answer the following questions. (Any Four) 12**

- a) Define BOD. How it is determined. Explain its importance.  
b) Explain characteristics of batteries.  
c) Explain solid lubricants.  
d) 6 gm of an oil sample after saponification with 60 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titer value of 15 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 60 ml. Calculate saponification value of an oil sample.  
e) Define Lubricant. Explain its functions.  
f) Explain prevention of corrosion by tinning.

**Section – II**

**Q.4 Answer the following questions. (Any Four)**

**16**

- a) Explain composition, properties and applications of cast iron, steel and wrought iron.
- b) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:  
Volume of the gaseous fuel burnt at STP =  $0.12 \text{ m}^3$   
Weight of water used for cooling = 36.2 Kg  
Weight of steam condensed = 0.031 Kg  
Temperature of Inlet water =  $24.2^\circ\text{C}$   
Temperature of Outlet water =  $39.3^\circ\text{C}$   
Determine the gross and net calorific values of gaseous fuel.  
(Take latent heat of condensation of steam = 587 kcal/kg)
- c) Explain construction and working of bomb calorimeter.
- d) Explain molding of plastics in to articles by following methods.
  - 1) Extrusion molding
  - 2) Injection molding
- e) Explain properties and applications of PVC and PET.
- f) Explain components and instrumentation of GLC with labelled diagram.

**Q.5 Answer the following questions. (Any Four)**

**12**

- a) Explain any three types of glass.
- b) Compare solid and gaseous fuels.
- c) Summarize advantages and disadvantages of biodiesel.
- d) Explain vulcanization of natural rubber.
- e) Calculate Degree of polymerization of polyethene having molecular weight 18200. (Mol. Wt. of ethene = 28)
- f) Calculate weight of  $\text{MgSO}_4$  required to prepare 0.4 N 500 ml solution. (Mol. Wt. of  $\text{MgSO}_4$  = 120)

| Set | R |
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Max. Marks: 70

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### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) A thermoplastic is formed by the phenomenon of : \_\_\_\_\_.  
a) Chlorination                                  b) condensation polymerization  
c) Nitration                                        d) chain polymerization
- 2) Natural rubber is basically a polymer of: \_\_\_\_\_.  
a) isoprene                                         b) propylene  
c) ethylene                                         d) propane
- 3) The commonly used carrier gas in GLC is \_\_\_\_\_.  
a) F<sub>2</sub>                                                  b) Br<sub>2</sub>  
c) Cl<sub>2</sub>                                                 d) N<sub>2</sub>
- 4) A fuel cell is used to convert chemical energy into \_\_\_\_\_.  
a) Mechanical energy                              b) Solar energy  
c) Electrical energy                                 d) Potential energy
- 5) The process of removing extra common salt from water is called: \_\_\_\_\_.  
a) deionization                                      b) softening  
c) disinfections                                      d) desalination
- 6) Hard water is unfit for use in boilers for “steam raising” because: \_\_\_\_\_.  
a) its boiling point is higher  
b) steam is generated at a high pressure  
c) it leads to scale formation inside boiler  
d) water undergoes decomposition into oxygen and hydrogen
- 7) A lubricant is used primarily to prevent: \_\_\_\_\_.  
a) corrosion of metals  
b) oxidation of metals  
c) reduction of metals  
d) wearing out of rubbing metallic surfaces
- 8) Animal and vegetable oils are : \_\_\_\_\_.  
a) very cheap                                         b) not oxidized easily  
c) not thickened in use                              d) good in oiliness





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Set **R**

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**ENGINEERING CHEMISTRY**

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Max. Marks: 56

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**Section – I**

**Q.2 Answer the following questions. (Any Four) 16**

- a) A sample of water on analysis was found to contain the following impurities in mg/lit:

|                                    | Amount | Mo. Wt. |
|------------------------------------|--------|---------|
| Ca(HCO <sub>3</sub> ) <sub>2</sub> | 30.15  | 162     |
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| CaSO <sub>4</sub>                  | 27.00  | 136     |
| MgCl <sub>2</sub>                  | 26.5   | 95      |

Calculate the temporary, permanent and total hardness of water in mg/lit.

- b) Define aeration. Explain different types of aerators.  
c) Define disinfection. Explain disinfection of water by chlorine, Chloramine and bleaching powder.  
d) Define following terms.  
1) Viscosity Index  
2) Acid Value  
3) Flash point  
4) Aniline Point  
e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.  
f) Explain factors affecting on rate of corrosion.

**Q.3 Answer the following questions. (Any Four) 12**

- a) Define BOD. How it is determined. Explain its importance.  
b) Explain characteristics of batteries.  
c) Explain solid lubricants.  
d) 6 gm of an oil sample after saponification with 60 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titer value of 15 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 60 ml. Calculate saponification value of an oil sample.  
e) Define Lubricant. Explain its functions.  
f) Explain prevention of corrosion by tinning.

Section – II

**Q.4 Answer the following questions. (Any Four)**

**16**

- a) Explain composition, properties and applications of cast iron, steel and wrought iron.
- b) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:  
Volume of the gaseous fuel burnt at STP =  $0.12 \text{ m}^3$   
Weight of water used for cooling = 36.2 Kg  
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Determine the gross and net calorific values of gaseous fuel.  
(Take latent heat of condensation of steam = 587 kcal/kg)
- c) Explain construction and working of bomb calorimeter.
- d) Explain molding of plastics in to articles by following methods.
  - 1) Extrusion molding
  - 2) Injection molding
- e) Explain properties and applications of PVC and PET.
- f) Explain components and instrumentation of GLC with labelled diagram.

**Q.5 Answer the following questions. (Any Four)**

**12**

- a) Explain any three types of glass.
- b) Compare solid and gaseous fuels.
- c) Summarize advantages and disadvantages of biodiesel.
- d) Explain vulcanization of natural rubber.
- e) Calculate Degree of polymerization of polyethene having molecular weight 18200. (Mol. Wt. of ethene = 28)
- f) Calculate weight of  $\text{MgSO}_4$  required to prepare 0.4 N 500 ml solution. (Mol. Wt. of  $\text{MgSO}_4$  = 120)

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**F. Y. (B.Tech.) (Sem - II) (CBCS) Examination: Oct/Nov-2022**  
**ENGINEERING CHEMISTRY**

Day & Date: Friday, 10-03-2023

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) During wet corrosion \_\_\_\_\_.  
a) Anodic part undergoes oxidation  
b) Cathodic part undergoes oxidation  
c) Anodic part undergoes reduction  
d) Neither anodic nor cathodic part undergoes any change
- 2) Purest form of iron is : \_\_\_\_\_.  
a) steel  
b) wrought iron  
c) pig iron  
d) cast iron
- 3) The main constituent of safety glass is: \_\_\_\_\_.  
a)  $\text{CaCO}_3$   
b)  $\text{PbO}$   
c) vinyl plastic  
d) boron
- 4) A good fuel should have: \_\_\_\_\_.  
a) high moisture content  
b) low calorific value  
c) moderate ignition temperature  
d) high ash content
- 5) Charcoal is a secondary fuel derived from \_\_\_\_\_.  
a) Wood  
b) Lignite  
c) Petroleum  
d) Coke
- 6) A thermoplastic is formed by the phenomenon of : \_\_\_\_\_.  
a) Chlorination  
b) condensation polymerization  
c) Nitration  
d) chain polymerization
- 7) Natural rubber is basically a polymer of: \_\_\_\_\_.  
a) isoprene  
b) propylene  
c) ethylene  
d) propane
- 8) The commonly used carrier gas in GLC is \_\_\_\_\_.  
a)  $\text{F}_2$   
b)  $\text{Br}_2$   
c)  $\text{Cl}_2$   
d)  $\text{N}_2$
- 9) A fuel cell is used to convert chemical energy into \_\_\_\_\_.  
a) Mechanical energy  
b) Solar energy  
c) Electrical energy  
d) Potential energy



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Set **S**

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**ENGINEERING CHEMISTRY**

Day & Date: Friday, 10-03-2023

Max. Marks: 56

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**Section – I**

**Q.2 Answer the following questions. (Any Four)**

**16**

- a) A sample of water on analysis was found to contain the following impurities in mg/lit:

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Calculate the temporary, permanent and total hardness of water in mg/lit.

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- a) Define BOD. How it is determined. Explain its importance.  
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d) 6 gm of an oil sample after saponification with 60 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titer value of 15 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 60 ml. Calculate saponification value of an oil sample.  
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**Section – II**

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**16**

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## Concrete Technology, Material Testing & Evaluation

Max. Marks: 70

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4) Assume suitable data if necessary.

Marks: 14

14

- 1) Creep is \_\_\_\_\_.
  - a) Time dependent
  - b) Time independent
  - c) Temperature dependent
  - d) None
- 2) IS Provision for concrete mix design is given by \_\_\_\_\_.
  - a) IS 456-2000
  - b) IS 10262-2009
  - c) IS 383-1970
  - d) None
- 3) Admixtures can be used to \_\_\_\_\_.
  - a) Improve workability
  - b) Reduce heat of hydration
  - c) Increase setting time
  - d) All of above
- 4) The ratio of W/C ratio \_\_\_\_\_ creep \_\_\_\_\_.
  - a) Increases, decreases
  - b) Increases, increases
  - c) Decreases, increases
  - d) None
- 5) Characteristic strength of concrete is defined as the strength of concrete below which not more than of the test results are expected to fail
  - a) 15%
  - b) 10%
  - c) 7%
  - d) None
- 6) The workability of concrete is measured by
  - a) Slump test
  - b) Compaction factor test
  - c) Vee Bee Consistometer test
  - d) All of the above
- 7) In terms of oxide composition maximum percentage of ingredient in cement is that of
  - a) Lime
  - b) Iron oxide
  - c) Alumina
  - d) Silica
- 8) Tensile test can be performed on \_\_\_\_\_.
  - a) Impact testing machine
  - b) Universal testing machine
  - c) Rockwell Tester
  - d) None



- 9) Final setting time of cement should not be more than
  - a) 30 min
  - b) 600 min
  - c) 600 sec
  - d) None
- 10) In Extra Rapid Hardening Cement Calcium Chloride is limited to \_\_\_\_\_.
  - a) 5
  - b) 7
  - c) 10
  - d) 2
- 11) Volume of 1 Bag cement is \_\_\_\_\_.
  - a) 35 lit
  - b) 60 lit
  - c) 50 lit
  - d) none of above
- 12) In Low heat cement  $C_2S$  is \_\_\_\_\_ &  $C_3S$  is \_\_\_\_\_.
  - a) decreased increased
  - b) increased, decreased
  - c) decreased, decreased
  - d) None
- 13) For W/C ratio of 0.45 the water content per bag of cement is \_\_\_\_\_.
  - a) 25kg
  - b) 30 kg
  - c) 22.5kg
  - d) 20kg
- 14) The modulus of elasticity of concrete is expressed as \_\_\_\_\_.
  - a)  $500 \sqrt{f_{ck}}$
  - b)  $5000 \sqrt{f_{ck}}$
  - c)  $0.7 \sqrt{f_{ck}}$
  - d) None of above

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Concrete Technology, Material Testing & Evaluation**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any Two of the following. 12**

- a) Explain about Accelerators and Retarders.
- b) Explain in detail Wet Process of Manufacturing of cement with neat sketch.
- c) Enlist factor affecting workability of concrete & explain any Two.

**Q.3 Write a note on any Four of the following. 16**

- a) Bulking of Sand
- b) Plasticizers & Super plasticizers
- c) Batching of Concrete
- d) Rapid Hardening Cement
- e) Split tensile test

**Section – II**

**Q.4 Write a note on any Three of the following. 12**

- a) Shrinkage of Concrete
- b) Factor affecting Creep of concrete
- c) Sulphate Attack
- d) Tension test on mild Steel

**Q.5 Explain in Detail Procedure of ACI method of Concrete Mix design. 16**

**OR**

**Q.6 Design a Concrete Mix for RCC Building from following data.**

- 1) Grade of Concrete-M25
- 2) Type of Cement-OPC 53
- 3) Workability (slump)-100
- 4) Exposure Condition -Moderate
- 5) Size of Aggregate -20mm
- 6) Grading Zone of Sand - Zone II
- 7) Specific Gravity of Cement - 3.15
- 8) Specific Gravity of FA - 2.7
- 9) Specific Gravity of CA - 2.72
- 10) Minimum Cement Content - 320 kg/m<sup>3</sup>
- 11) Maximum Cement Content - 450 kg/m<sup>3</sup>
- 12) Water Absorption for CA-1%
- 13) Moisture content for FA- 0.5%

**Table 1 Assumed Standard Deviation**  
(Clauses 3.2.1.2, A-3 and B-3)

| Sl No.<br>(1)                           | Grade of Concrete<br>(2)                     | Assumed Standard Deviation<br>N/mm <sup>2</sup><br>(3) |
|-----------------------------------------|----------------------------------------------|--------------------------------------------------------|
| i)<br>ii)                               | M 10<br>M 15                                 | 3.5                                                    |
| iii)<br>iv)                             | M 20<br>M 25                                 | 4.0                                                    |
| v)<br>vi)<br>vii)<br>viii)<br>ix)<br>x) | M 30<br>M 35<br>M 40<br>M 45<br>M 50<br>M 55 | 5.0                                                    |

**Table 2 Maximum Water Content per Cubic Metre of Concrete for Nominal Maximum Size of Aggregate**  
(Clauses 4.2, A-5 and B-5)

| Sl No.<br>(1) | Nominal Maximum Size of Aggregate<br>mm<br>(2) | Maximum Water Content <sup>1)</sup><br>kg<br>(3) |
|---------------|------------------------------------------------|--------------------------------------------------|
| i)            | 10                                             | 208                                              |
| ii)           | 20                                             | 186                                              |
| iii)          | 40                                             | 165                                              |

NOTE — These quantities of mixing water are for use in computing cementitious material contents for trial batches.

<sup>1)</sup> Water content corresponding to saturated surface dry aggregate.

**Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate**  
(Clauses 4.4, A-7 and B-7)

| Sl No.<br>(1) | Nominal Maximum Size of Aggregate<br>mm<br>(2) | Volume of Coarse Aggregate <sup>1)</sup> per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate |                 |                |               |
|---------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------|----------------|---------------|
|               |                                                | Zone IV<br>(3)                                                                                                    | Zone III<br>(4) | Zone II<br>(5) | Zone I<br>(6) |
| i)            | 10                                             | 0.50                                                                                                              | 0.48            | 0.46           | 0.44          |
| ii)           | 20                                             | 0.66                                                                                                              | 0.64            | 0.62           | 0.60          |
| iii)          | 40                                             | 0.75                                                                                                              | 0.73            | 0.71           | 0.69          |

<sup>1)</sup> Volumes are based on aggregates in saturated surface dry condition.

**Table 5 Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size**

(Clauses 6.1.2, 8.2.4.1 and 9.1.2)

| Sl No.<br>(1) | Exposure<br>(2) | Plain Concrete                                     |                                        |                                  | Reinforced Concrete                                |                                        |                                  |
|---------------|-----------------|----------------------------------------------------|----------------------------------------|----------------------------------|----------------------------------------------------|----------------------------------------|----------------------------------|
|               |                 | Minimum Cement Content<br>kg/m <sup>3</sup><br>(3) | Maximum Free Water-Cement Ratio<br>(4) | Minimum Grade of Concrete<br>(5) | Minimum Cement Content<br>kg/m <sup>3</sup><br>(6) | Maximum Free Water-Cement Ratio<br>(7) | Minimum Grade of Concrete<br>(8) |
| i)            | Mild            | 220                                                | 0.60                                   | -                                | 300                                                | 0.55                                   | M 20                             |
| iii)          | Moderate        | 240                                                | 0.60                                   | M 15                             | 300                                                | 0.50                                   | M 25                             |
| iii)          | Severe          | 250                                                | 0.50                                   | M 20                             | 320                                                | 0.45                                   | M 30                             |
| iv)           | Very severe     | 260                                                | 0.45                                   | M 20                             | 340                                                | 0.45                                   | M 35                             |
| v)            | Extreme         | 280                                                | 0.40                                   | M 25                             | 360                                                | 0.40                                   | M 40                             |

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Concrete Technology, Material Testing & Evaluation**

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Tensile test can be performed on \_\_\_\_\_.  
a) Impact testing machine      b) Universal testing machine  
c) Rockwell Tester              d) None
- 2) Final setting time of cement should not be more than  
a) 30 min                              b) 600 min  
c) 600 sec                             d) None
- 3) In Extra Rapid Hardening Cement Calcium Chloride is limited to \_\_\_\_%.  
a) 5                                      b) 7  
c) 10                                     d) 2
- 4) Volume of 1 Bag cement is \_\_\_\_\_.  
a) 35 lit                                b) 60 lit  
c) 50 lit                                d) none of above
- 5) In Low heat cement  $C_2S$  is \_\_\_\_\_ &  $C_3S$  is \_\_\_\_\_.  
a) decreased increased          b) increased, decreased  
c) decreased, decreased        d) None
- 6) For W/C ratio of 0.45 the water content per bag of cement is \_\_\_\_\_.  
a) 25kg                                b) 30 kg  
c) 22.5kg                              d) 20kg
- 7) The modulus of elasticity of concrete is expressed as \_\_\_\_\_.  
a)  $500 \sqrt{f_{ck}}$                               b)  $5000 \sqrt{f_{ck}}$   
c)  $0.7 \sqrt{f_{ck}}$                               d) None of above
- 8) Creep is \_\_\_\_\_.  
a) Time dependent                  b) Time independent  
c) Temperature dependent        d) None
- 9) IS Provision for concrete mix design is given by \_\_\_\_\_.  
a) IS 456-2000                        b) IS 10262-2009  
c) IS 383-1970                        d) None

- 10)** Admixtures can be used to \_\_\_\_\_.  
a) Improve workability                      b) Reduce heat of hydration  
c) Increase setting time                    d) All of above
- 11)** The ratio of W/C ratio \_\_\_\_\_ creep \_\_\_\_\_.  
a) Increases, decreases                      b) Increases, increases  
c) Decreases, increases                    d) None
- 12)** Characteristic strength of concrete is defined as the strength of concrete below which not more than of the test results are expected to fail  
a) 15%                                              b) 10%  
c) 7%                                                d) None
- 13)** The workability of concrete is measured by  
a) Slump test                                      b) Compaction factor test  
c) Vee Bee Consistometer test            d) All of the above
- 14)** In terms of oxide composition maximum percentage of ingredient in cement is that of  
a) Lime                                              b) Iron oxide  
c) Alumina                                           d) Silica

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Concrete Technology, Material Testing & Evaluation**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Two of the following. 12**

- a) Explain about Accelerators and Retarders.
- b) Explain in detail Wet Process of Manufacturing of cement with neat sketch.
- c) Enlist factor affecting workability of concrete & explain any Two.

**Q.3 Write a note on any Four of the following. 16**

- a) Bulking of Sand
- b) Plasticizers & Super plasticizers
- c) Batching of Concrete
- d) Rapid Hardening Cement
- e) Split tensile test

**Section – II**

**Q.4 Write a note on any Three of the following. 12**

- a) Shrinkage of Concrete
- b) Factor affecting Creep of concrete
- c) Sulphate Attack
- d) Tension test on mild Steel

**Q.5 Explain in Detail Procedure of ACI method of Concrete Mix design. 16**

**OR**

**Q.6 Design a Concrete Mix for RCC Building from following data.**

- 1) Grade of Concrete-M25
- 2) Type of Cement-OPC 53
- 3) Workability (slump)-100
- 4) Exposure Condition -Moderate
- 5) Size of Aggregate -20mm
- 6) Grading Zone of Sand - Zone II
- 7) Specific Gravity of Cement - 3.15
- 8) Specific Gravity of FA - 2.7
- 9) Specific Gravity of CA - 2.72
- 10) Minimum Cement Content - 320 kg/m<sup>3</sup>
- 11) Maximum Cement Content - 450 kg/m<sup>3</sup>
- 12) Water Absorption for CA-1%
- 13) Moisture content for FA- 0.5%

**Table 1 Assumed Standard Deviation**  
(Clauses 3.2.1.2, A-3 and B-3)

| Sl No.<br>(1)                           | Grade of Concrete<br>(2)                     | Assumed Standard Deviation<br>N/mm <sup>2</sup><br>(3) |
|-----------------------------------------|----------------------------------------------|--------------------------------------------------------|
| i)<br>ii)                               | M 10<br>M 15                                 | 3.5                                                    |
| iii)<br>iv)                             | M 20<br>M 25                                 | 4.0                                                    |
| v)<br>vi)<br>vii)<br>viii)<br>ix)<br>x) | M 30<br>M 35<br>M 40<br>M 45<br>M 50<br>M 55 | 5.0                                                    |

**Table 2 Maximum Water Content per Cubic Metre of Concrete for Nominal Maximum Size of Aggregate**  
(Clauses 4.2, A-5 and B-5)

| Sl No.<br>(1) | Nominal Maximum Size of Aggregate<br>mm<br>(2) | Maximum Water Content <sup>1)</sup><br>kg<br>(3) |
|---------------|------------------------------------------------|--------------------------------------------------|
| i)            | 10                                             | 208                                              |
| ii)           | 20                                             | 186                                              |
| iii)          | 40                                             | 165                                              |

NOTE — These quantities of mixing water are for use in computing cementitious material contents for trial batches.

<sup>1)</sup> Water content corresponding to saturated surface dry aggregate.

**Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate**  
(Clauses 4.4, A-7 and B-7)

| Sl No.<br>(1) | Nominal Maximum Size of Aggregate<br>mm<br>(2) | Volume of Coarse Aggregate <sup>1)</sup> per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate |                 |                |               |
|---------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------|----------------|---------------|
|               |                                                | Zone IV<br>(3)                                                                                                    | Zone III<br>(4) | Zone II<br>(5) | Zone I<br>(6) |
| i)            | 10                                             | 0.50                                                                                                              | 0.48            | 0.46           | 0.44          |
| ii)           | 20                                             | 0.66                                                                                                              | 0.64            | 0.62           | 0.60          |
| iii)          | 40                                             | 0.75                                                                                                              | 0.73            | 0.71           | 0.69          |

<sup>1)</sup> Volumes are based on aggregates in saturated surface dry condition.

**Table 5 Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size**

(Clauses 6.1.2, 8.2.4.1 and 9.1.2)

| Sl No.<br>(1) | Exposure<br>(2) | Plain Concrete                                     |                                        |                                  | Reinforced Concrete                                |                                        |                                  |
|---------------|-----------------|----------------------------------------------------|----------------------------------------|----------------------------------|----------------------------------------------------|----------------------------------------|----------------------------------|
|               |                 | Minimum Cement Content<br>kg/m <sup>3</sup><br>(3) | Maximum Free Water-Cement Ratio<br>(4) | Minimum Grade of Concrete<br>(5) | Minimum Cement Content<br>kg/m <sup>3</sup><br>(6) | Maximum Free Water-Cement Ratio<br>(7) | Minimum Grade of Concrete<br>(8) |
| i)            | Mild            | 220                                                | 0.60                                   | -                                | 300                                                | 0.55                                   | M 20                             |
| iii)          | Moderate        | 240                                                | 0.60                                   | M 15                             | 300                                                | 0.50                                   | M 25                             |
| iii)          | Severe          | 250                                                | 0.50                                   | M 20                             | 320                                                | 0.45                                   | M 30                             |
| iv)           | Very severe     | 260                                                | 0.45                                   | M 20                             | 340                                                | 0.45                                   | M 35                             |
| v)            | Extreme         | 280                                                | 0.40                                   | M 25                             | 360                                                | 0.40                                   | M 40                             |

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## Concrete Technology, Material Testing & Evaluation

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data if necessary.

Marks: 14

14

- 1) Volume of 1 Bag cement is \_\_\_\_\_.  
a) 35 lit                                      b) 60 lit  
c) 50 lit                                        d) none of above
- 2) In Low heat cement C<sub>2</sub>S is \_\_\_\_\_ & C<sub>3</sub>S is \_\_\_\_\_.  
a) decreased increased                  b) increased, decreased  
c) decreased, decreased                 d) None
- 3) For W/C ratio of 0.45 the water content per bag of cement is \_\_\_\_\_.  
a) 25kg                                         b) 30 kg  
c) 22.5kg                                      d) 20kg
- 4) The modulus of elasticity of concrete is expressed as \_\_\_\_\_.  
a)  $500 \sqrt{f_{ck}}$                                       b)  $5000 \sqrt{f_{ck}}$   
c)  $0.7 \sqrt{f_{ck}}$                                       d) None of above
- 5) Creep is \_\_\_\_\_.  
a) Time dependent                            b) Time independent  
c) Temperature dependent                d) None
- 6) IS Provision for concrete mix design is given by \_\_\_\_\_.  
a) IS 456-2000                                b) IS 10262-2009  
c) IS 383-1970                                d) None
- 7) Admixtures can be used to \_\_\_\_\_.  
a) Improve workability                      b) Reduce heat of hydration  
c) Increase setting time                      d) All of above
- 8) The ratio of W/C ratio \_\_\_\_\_ creep \_\_\_\_\_.  
a) Increases, decreases                      b) Increases, increases  
c) Decreases, increases                      d) None
- 9) Characteristic strength of concrete is defined as the strength of concrete below which not more than of the test results are expected to fail  
a) 15%                                            b) 10%  
c) 7%                                              d) None





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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Concrete Technology, Material Testing & Evaluation**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Two of the following. 12**

- a) Explain about Accelerators and Retarders.
- b) Explain in detail Wet Process of Manufacturing of cement with neat sketch.
- c) Enlist factor affecting workability of concrete & explain any Two.

**Q.3 Write a note on any Four of the following. 16**

- a) Bulking of Sand
- b) Plasticizers & Super plasticizers
- c) Batching of Concrete
- d) Rapid Hardening Cement
- e) Split tensile test

**Section – II**

**Q.4 Write a note on any Three of the following. 12**

- a) Shrinkage of Concrete
- b) Factor affecting Creep of concrete
- c) Sulphate Attack
- d) Tension test on mild Steel

**Q.5 Explain in Detail Procedure of ACI method of Concrete Mix design. 16**

**OR**

**Q.6 Design a Concrete Mix for RCC Building from following data.**

- 1) Grade of Concrete-M25
- 2) Type of Cement-OPC 53
- 3) Workability (slump)-100
- 4) Exposure Condition -Moderate
- 5) Size of Aggregate -20mm
- 6) Grading Zone of Sand - Zone II
- 7) Specific Gravity of Cement - 3.15
- 8) Specific Gravity of FA - 2.7
- 9) Specific Gravity of CA - 2.72
- 10) Minimum Cement Content - 320 kg/m<sup>3</sup>
- 11) Maximum Cement Content - 450 kg/m<sup>3</sup>
- 12) Water Absorption for CA-1%
- 13) Moisture content for FA- 0.5%

**Table 1 Assumed Standard Deviation**  
(Clauses 3.2.1.2, A-3 and B-3)

| Sl No.<br>(1)                           | Grade of Concrete<br>(2)                     | Assumed Standard Deviation<br>N/mm <sup>2</sup><br>(3) |
|-----------------------------------------|----------------------------------------------|--------------------------------------------------------|
| i)<br>ii)                               | M 10<br>M 15                                 | 3.5                                                    |
| iii)<br>iv)                             | M 20<br>M 25                                 | 4.0                                                    |
| v)<br>vi)<br>vii)<br>viii)<br>ix)<br>x) | M 30<br>M 35<br>M 40<br>M 45<br>M 50<br>M 55 | 5.0                                                    |

**Table 2 Maximum Water Content per Cubic Metre of Concrete for Nominal Maximum Size of Aggregate**  
(Clauses 4.2, A-5 and B-5)

| Sl No.<br>(1) | Nominal Maximum Size of Aggregate<br>mm<br>(2) | Maximum Water Content <sup>1)</sup><br>kg<br>(3) |
|---------------|------------------------------------------------|--------------------------------------------------|
| i)            | 10                                             | 208                                              |
| ii)           | 20                                             | 186                                              |
| iii)          | 40                                             | 165                                              |

NOTE — These quantities of mixing water are for use in computing cementitious material contents for trial batches.

<sup>1)</sup> Water content corresponding to saturated surface dry aggregate.

**Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate**  
(Clauses 4.4, A-7 and B-7)

| Sl No.<br>(1) | Nominal Maximum Size of Aggregate<br>mm<br>(2) | Volume of Coarse Aggregate <sup>1)</sup> per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate |                 |                |               |
|---------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------|----------------|---------------|
|               |                                                | Zone IV<br>(3)                                                                                                    | Zone III<br>(4) | Zone II<br>(5) | Zone I<br>(6) |
| i)            | 10                                             | 0.50                                                                                                              | 0.48            | 0.46           | 0.44          |
| ii)           | 20                                             | 0.66                                                                                                              | 0.64            | 0.62           | 0.60          |
| iii)          | 40                                             | 0.75                                                                                                              | 0.73            | 0.71           | 0.69          |

<sup>1)</sup> Volumes are based on aggregates in saturated surface dry condition.

**Table 5 Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size**

(Clauses 6.1.2, 8.2.4.1 and 9.1.2)

| Sl No.<br>(1) | Exposure<br>(2) | Plain Concrete                                     |                                        |                                  | Reinforced Concrete                                |                                        |                                  |
|---------------|-----------------|----------------------------------------------------|----------------------------------------|----------------------------------|----------------------------------------------------|----------------------------------------|----------------------------------|
|               |                 | Minimum Cement Content<br>kg/m <sup>3</sup><br>(3) | Maximum Free Water-Cement Ratio<br>(4) | Minimum Grade of Concrete<br>(5) | Minimum Cement Content<br>kg/m <sup>3</sup><br>(6) | Maximum Free Water-Cement Ratio<br>(7) | Minimum Grade of Concrete<br>(8) |
| i)            | Mild            | 220                                                | 0.60                                   | -                                | 300                                                | 0.55                                   | M 20                             |
| iii)          | Moderate        | 240                                                | 0.60                                   | M 15                             | 300                                                | 0.50                                   | M 25                             |
| iii)          | Severe          | 250                                                | 0.50                                   | M 20                             | 320                                                | 0.45                                   | M 30                             |
| iv)           | Very severe     | 260                                                | 0.45                                   | M 20                             | 340                                                | 0.45                                   | M 35                             |
| v)            | Extreme         | 280                                                | 0.40                                   | M 25                             | 360                                                | 0.40                                   | M 40                             |

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Concrete Technology, Material Testing & Evaluation**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The workability of concrete is measured by
  - a) Slump test
  - b) Compaction factor test
  - c) Vee Bee Consistometer test
  - d) All of the above
- 2) In terms of oxide composition maximum percentage of ingredient in cement is that of
  - a) Lime
  - b) Iron oxide
  - c) Alumina
  - d) Silica
- 3) Tensile test can be performed on \_\_\_\_\_.
  - a) Impact testing machine
  - b) Universal testing machine
  - c) Rockwell Tester
  - d) None
- 4) Final setting time of cement should not be more than
  - a) 30 min
  - b) 600 min
  - c) 600 sec
  - d) None
- 5) In Extra Rapid Hardening Cement Calcium Chloride is limited to \_\_\_\_%.
  - a) 5
  - b) 7
  - c) 10
  - d) 2
- 6) Volume of 1 Bag cement is \_\_\_\_\_.
  - a) 35 lit
  - b) 60 lit
  - c) 50 lit
  - d) none of above
- 7) In Low heat cement  $C_2S$  is \_\_\_\_\_ &  $C_3S$  is \_\_\_\_\_.
  - a) decreased increased
  - b) increased, decreased
  - c) decreased, decreased
  - d) None
- 8) For W/C ratio of 0.45 the water content per bag of cement is \_\_\_\_\_.
  - a) 25kg
  - b) 30 kg
  - c) 22.5kg
  - d) 20kg
- 9) The modulus of elasticity of concrete is expressed as \_\_\_\_\_.
  - a)  $500 \sqrt{f_{ck}}$
  - b)  $5000 \sqrt{f_{ck}}$
  - c)  $0.7 \sqrt{f_{ck}}$
  - d) None of above

- 10)** Creep is \_\_\_\_\_.  
a) Time dependent                      b) Time independent  
c) Temperature dependent            d) None
- 11)** IS Provision for concrete mix design is given by \_\_\_\_\_.  
a) IS 456-2000                          b) IS 10262-2009  
c) IS 383-1970                          d) None
- 12)** Admixtures can be used to \_\_\_\_\_.  
a) Improve workability                b) Reduce heat of hydration  
c) Increase setting time                d) All of above
- 13)** The ratio of W/C ratio \_\_\_\_\_ creep \_\_\_\_\_.  
a) Increases, decreases                b) Increases, increases  
c) Decreases, increases                d) None
- 14)** Characteristic strength of concrete is defined as the strength of concrete below which not more than of the test results are expected to fail  
a) 15%                                      b) 10%  
c) 7%                                        d) None

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
CIVIL ENGINEERING**

**Concrete Technology, Material Testing & Evaluation**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Two of the following. 12**

- a) Explain about Accelerators and Retarders.
- b) Explain in detail Wet Process of Manufacturing of cement with neat sketch.
- c) Enlist factor affecting workability of concrete & explain any Two.

**Q.3 Write a note on any Four of the following. 16**

- a) Bulking of Sand
- b) Plasticizers & Super plasticizers
- c) Batching of Concrete
- d) Rapid Hardening Cement
- e) Split tensile test

**Section – II**

**Q.4 Write a note on any Three of the following. 12**

- a) Shrinkage of Concrete
- b) Factor affecting Creep of concrete
- c) Sulphate Attack
- d) Tension test on mild Steel

**Q.5 Explain in Detail Procedure of ACI method of Concrete Mix design. 16**

**OR**

**Q.6 Design a Concrete Mix for RCC Building from following data.**

- 1) Grade of Concrete-M25
- 2) Type of Cement-OPC 53
- 3) Workability (slump)-100
- 4) Exposure Condition -Moderate
- 5) Size of Aggregate -20mm
- 6) Grading Zone of Sand - Zone II
- 7) Specific Gravity of Cement - 3.15
- 8) Specific Gravity of FA - 2.7
- 9) Specific Gravity of CA - 2.72
- 10) Minimum Cement Content - 320 kg/m<sup>3</sup>
- 11) Maximum Cement Content - 450 kg/m<sup>3</sup>
- 12) Water Absorption for CA-1%
- 13) Moisture content for FA- 0.5%

**Table 1 Assumed Standard Deviation**  
(Clauses 3.2.1.2, A-3 and B-3)

| Sl No.<br>(1)                           | Grade of Concrete<br>(2)                     | Assumed Standard Deviation<br>N/mm <sup>2</sup><br>(3) |
|-----------------------------------------|----------------------------------------------|--------------------------------------------------------|
| i)<br>ii)                               | M 10<br>M 15                                 | 3.5                                                    |
| iii)<br>iv)                             | M 20<br>M 25                                 | 4.0                                                    |
| v)<br>vi)<br>vii)<br>viii)<br>ix)<br>x) | M 30<br>M 35<br>M 40<br>M 45<br>M 50<br>M 55 | 5.0                                                    |

**Table 2 Maximum Water Content per Cubic Metre of Concrete for Nominal Maximum Size of Aggregate**  
(Clauses 4.2, A-5 and B-5)

| Sl No.<br>(1) | Nominal Maximum Size of Aggregate<br>mm<br>(2) | Maximum Water Content <sup>1)</sup><br>kg<br>(3) |
|---------------|------------------------------------------------|--------------------------------------------------|
| i)            | 10                                             | 208                                              |
| ii)           | 20                                             | 186                                              |
| iii)          | 40                                             | 165                                              |

NOTE — These quantities of mixing water are for use in computing cementitious material contents for trial batches.

<sup>1)</sup> Water content corresponding to saturated surface dry aggregate.

**Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate**  
(Clauses 4.4, A-7 and B-7)

| Sl No.<br>(1) | Nominal Maximum Size of Aggregate<br>mm<br>(2) | Volume of Coarse Aggregate <sup>1)</sup> per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate |                 |                |               |
|---------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------|----------------|---------------|
|               |                                                | Zone IV<br>(3)                                                                                                    | Zone III<br>(4) | Zone II<br>(5) | Zone I<br>(6) |
| i)            | 10                                             | 0.50                                                                                                              | 0.48            | 0.46           | 0.44          |
| ii)           | 20                                             | 0.66                                                                                                              | 0.64            | 0.62           | 0.60          |
| iii)          | 40                                             | 0.75                                                                                                              | 0.73            | 0.71           | 0.69          |

<sup>1)</sup> Volumes are based on aggregates in saturated surface dry condition.

**Table 5 Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size**

(Clauses 6.1.2, 8.2.4.1 and 9.1.2)

| Sl No.<br>(1) | Exposure<br>(2) | Plain Concrete                                     |                                        |                                  | Reinforced Concrete                                |                                        |                                  |
|---------------|-----------------|----------------------------------------------------|----------------------------------------|----------------------------------|----------------------------------------------------|----------------------------------------|----------------------------------|
|               |                 | Minimum Cement Content<br>kg/m <sup>3</sup><br>(3) | Maximum Free Water-Cement Ratio<br>(4) | Minimum Grade of Concrete<br>(5) | Minimum Cement Content<br>kg/m <sup>3</sup><br>(6) | Maximum Free Water-Cement Ratio<br>(7) | Minimum Grade of Concrete<br>(8) |
| i)            | Mild            | 220                                                | 0.60                                   | -                                | 300                                                | 0.55                                   | M 20                             |
| iii)          | Moderate        | 240                                                | 0.60                                   | M 15                             | 300                                                | 0.50                                   | M 25                             |
| iii)          | Severe          | 250                                                | 0.50                                   | M 20                             | 320                                                | 0.45                                   | M 30                             |
| iv)           | Very severe     | 260                                                | 0.45                                   | M 20                             | 340                                                | 0.45                                   | M 35                             |
| v)            | Extreme         | 280                                                | 0.40                                   | M 25                             | 360                                                | 0.40                                   | M 40                             |

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Day & Date: Monday, 13-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

Marks: 14

14

- Page 1 of 12



- 8) Minimum how many satellites shall be accessible for user to get latitude, longitude, altitude, and time measurements in Global Positioning System?
- |      |       |
|------|-------|
| a) 3 | b) 4  |
| c) 8 | d) 24 |
- 9) In terrestrial photogrammetry photographs are taken by \_\_\_\_\_
- |                    |              |
|--------------------|--------------|
| a) Arial camera    | b) Drone     |
| c) Phototheodolite | d) Satellite |
- 10) LiDAR is \_\_\_\_\_
- |                                                 |
|-------------------------------------------------|
| a) Active remote sensing system                 |
| b) Passive remote sensing system                |
| c) Both Active as well as Passive remote system |
| d) None of these                                |
- 11) Drone can provide \_\_\_\_\_
- |                                                                                                    |
|----------------------------------------------------------------------------------------------------|
| a) a satisfactory means of performing the required survey in large scale projects                  |
| b) a satisfactory means of performing projects where access is difficult                           |
| c) Both survey in large scale projects as well as of performing projects where access is difficult |
| d) None of these                                                                                   |
- 12) Remote sensing in which energy from sun is used is \_\_\_\_\_
- |                                           |
|-------------------------------------------|
| a) Active Remote sensing                  |
| b) Passive remote sensing                 |
| c) Both active and passive remote sensing |
| d) None of these                          |
- 13) Following are components of GIS \_\_\_\_\_
- |             |                     |
|-------------|---------------------|
| a) Hardware | b) Software         |
| c) Users    | d) All of the above |
- 14) Following survey is required for route survey \_\_\_\_\_
- |                          |                  |
|--------------------------|------------------|
| a) Profile leveling      | b) Triangulation |
| c) Theodolite traversing | d) None of these |

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**Set P**

**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surveying & Geomatics**

Day & Date: Monday, 13-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) In Section – I, Q. 2 is compulsory; answer any two questions out of Q.3, Q.4, and Q.5.  
2) In Section – II, Q. 6 is compulsory; answer any two questions out of Q.7, Q.8, and Q.9.

**Section – I**

- Q.2 Write detailed note on** **12**  
a) Construction and use of Automatic level  
b) Differentiate between Direct and Indirect methods of Contouring  
c) Explain the methods of interpolation of contours
- Q.3 Explain** **08**  
a) Construction of vernier theodolite with parts  
b) Use of theodolite for measurement of horizontal angle using reiteration method
- Q.4 Explain** **08**  
a) Construction of Digital level  
b) Construction of Total station
- Q.5 Write notes on** **08**  
a) Geodimeter  
b) Tellurometer

**Section – II**

- Q.6 Write detailed notes on** **12**  
a) Space Segment of GPS  
b) Differentiate between Static GPS and Differential GPS methods  
c) GPS receivers and their comparison
- Q.7 Explain** **08**  
a) Flight Planning for aerial photogrammetry  
b) Scale of vertical photographs and its classification
- Q.8 Write notes on** **08**  
a) LiDAR and its advantages  
b) Drone surveying and its advantages over satellite remote sensing
- Q.9 Explain** **08**  
a) Electromagnetic Spectrum  
b) Compare the Raster images with Vector images

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surveying & Geomatics**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Minimum how many satellites shall be accessible for user to get latitude, longitude, altitude, and time measurements in Global Positioning System?
 

|      |       |
|------|-------|
| a) 3 | b) 4  |
| c) 8 | d) 24 |
- 2) In terrestrial photogrammetry photographs are taken by \_\_\_\_\_.
 

|                    |              |
|--------------------|--------------|
| a) Arial camera    | b) Drone     |
| c) Phototheodolite | d) Satellite |
- 3) LiDAR is \_\_\_\_\_.
 

|                                                 |
|-------------------------------------------------|
| a) Active remote sensing system                 |
| b) Passive remote sensing system                |
| c) Both Active as well as Passive remote system |
| d) None of these                                |
- 4) Drone can provide \_\_\_\_\_.
 

|                                                                                                    |
|----------------------------------------------------------------------------------------------------|
| a) a satisfactory means of performing the required survey in large scale projects                  |
| b) a satisfactory means of performing projects where access is difficult                           |
| c) Both survey in large scale projects as well as of performing projects where access is difficult |
| d) None of these                                                                                   |
- 5) Remote sensing in which energy from sun is used is \_\_\_\_\_.
 

|                                           |
|-------------------------------------------|
| a) Active Remote sensing                  |
| b) Passive remote sensing                 |
| c) Both active and passive remote sensing |
| d) None of these                          |
- 6) Following are components of GIS \_\_\_\_\_.
 

|             |                     |
|-------------|---------------------|
| a) Hardware | b) Software         |
| c) Users    | d) All of the above |
- 7) Following survey is required for route survey \_\_\_\_\_.
 

|                          |                  |
|--------------------------|------------------|
| a) Profile leveling      | b) Triangulation |
| c) Theodolite traversing | d) None of these |

- 8) In a tilting level, while taking the sight to a leveling staff, the centering of bubble is done by \_\_\_\_\_.
  - a) Foot screws
  - b) Tilting screw
  - c) Focusing screw
  - d) Tripod legs
- 9) The vertical distance between any two consecutive contours is called \_\_\_\_\_ (complete the sentence using correct option)
  - a) Horizontal equivalent
  - b) Contour interval
  - c) Height of instrument
  - d) Contour gradient
- 10) The theodolite is designed for precise measurement of following.
  - a) Both Horizontal and Vertical Distance
  - b) Difference in level
  - c) Both Horizontal and Vertical Angle
  - d) Coordinates of stations
- 11) The total latitude and departure of any point with respect to a common origin are known as \_\_\_\_\_.
  - a) Consecutive coordinates
  - b) Independent coordinates
  - c) Geodetic coordinates
  - d) Cartesian coordinates
- 12) In Digital level the field book is \_\_\_\_\_.
  - a) Printed on pages in a notebook
  - b) Digital on a PC
  - c) Digital in a laptop
  - d) Digital in microprocessor of level
- 13) The instrument using modulated light waves are known as \_\_\_\_\_.
  - a) Geodimeter
  - b) Tellurometer
  - c) Distometer
  - d) All the above
- 14) A total station is a combination of \_\_\_\_\_.
  - a) Electronic theodolite, EDM only
  - b) Vernier theodolite, EDM only
  - c) Electronic theodolite, Microprocessor only
  - d) Electronic theodolite, EDM, Microprocessor

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surveying & Geomatics**

Day & Date: Monday, 13-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) In Section – I, Q. 2 is compulsory; answer any two questions out of Q.3, Q.4, and Q.5.  
2) In Section – II, Q. 6 is compulsory; answer any two questions out of Q.7, Q.8, and Q.9.

**Section – I**

- Q.2 Write detailed note on** **12**  
a) Construction and use of Automatic level  
b) Differentiate between Direct and Indirect methods of Contouring  
c) Explain the methods of interpolation of contours
- Q.3 Explain** **08**  
a) Construction of vernier theodolite with parts  
b) Use of theodolite for measurement of horizontal angle using reiteration method
- Q.4 Explain** **08**  
a) Construction of Digital level  
b) Construction of Total station
- Q.5 Write notes on** **08**  
a) Geodimeter  
b) Tellurometer

**Section – II**

- Q.6 Write detailed notes on** **12**  
a) Space Segment of GPS  
b) Differentiate between Static GPS and Differential GPS methods  
c) GPS receivers and their comparison
- Q.7 Explain** **08**  
a) Flight Planning for aerial photogrammetry  
b) Scale of vertical photographs and its classification
- Q.8 Write notes on** **08**  
a) LiDAR and its advantages  
b) Drone surveying and its advantages over satellite remote sensing
- Q.9 Explain** **08**  
a) Electromagnetic Spectrum  
b) Compare the Raster images with Vector images

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surveying & Geomatics**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Drone can provide \_\_\_\_\_
  - a) a satisfactory means of performing the required survey in large scale projects
  - b) a satisfactory means of performing projects where access is difficult
  - c) Both survey in large scale projects as well as of performing projects where access is difficult
  - d) None of these
- 2) Remote sensing in which energy from sun is used is \_\_\_\_\_
  - a) Active Remote sensing
  - b) Passive remote sensing
  - c) Both active and passive remote sensing
  - d) None of these
- 3) Following are components of GIS \_\_\_\_\_
 

|             |                     |
|-------------|---------------------|
| a) Hardware | b) Software         |
| c) Users    | d) All of the above |
- 4) Following survey is required for route survey \_\_\_\_\_
 

|                          |                  |
|--------------------------|------------------|
| a) Profile leveling      | b) Triangulation |
| c) Theodolite traversing | d) None of these |
- 5) In a tilting level, while taking the sight to a leveling staff, the centering of bubble is done by \_\_\_\_\_.
 

|                   |                  |
|-------------------|------------------|
| a) Foot screws    | b) Tilting screw |
| c) Focusing screw | d) Tripod legs   |
- 6) The vertical distance between any two consecutive contours is called \_\_\_\_ (complete the sentence using correct option)
 

|                          |                     |
|--------------------------|---------------------|
| a) Horizontal equivalent | b) Contour interval |
| c) Height of instrument  | d) Contour gradient |
- 7) The theodolite is designed for precise measurement of following.
  - a) Both Horizontal and Vertical Distance
  - b) Difference in level
  - c) Both Horizontal and Vertical Angle
  - d) Coordinates of stations

- 8) The total latitude and departure of any point with respect to a common origin are known as \_\_\_\_\_.  
a) Consecutive coordinates                      b) Independent coordinates  
c) Geodetic coordinates                      d) Cartesian coordinates
- 9) In Digital level the field book is \_\_\_\_\_.  
a) Printed on pages in a notebook  
b) Digital on a PC  
c) Digital in a laptop  
d) Digital in microprocessor of level
- 10) The instrument using modulated light waves are known as \_\_\_\_\_.  
a) Geodimeter                      b) Tellurometer  
c) Distometer                      d) All the above
- 11) A total station is a combination of \_\_\_\_\_.  
a) Electronic theodolite, EDM only  
b) Vernier theodolite, EDM only  
c) Electronic theodolite, Microprocessor only  
d) Electronic theodolite, EDM, Microprocessor
- 12) Minimum how many satellites shall be accessible for user to get latitude, longitude, altitude, and time measurements in Global Positioning System?  
a) 3                      b) 4  
c) 8                      d) 24
- 13) In terrestrial photogrammetry photographs are taken by \_\_\_\_\_.  
a) Arial camera                      b) Drone  
c) Phototheodolite                      d) Satellite
- 14) LiDAR is \_\_\_\_\_.  
a) Active remote sensing system  
b) Passive remote sensing system  
c) Both Active as well as Passive remote system  
d) None of these

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surveying & Geomatics**

Day & Date: Monday, 13-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) In Section – I, Q. 2 is compulsory; answer any two questions out of Q.3, Q.4, and Q.5.  
2) In Section – II, Q. 6 is compulsory; answer any two questions out of Q.7, Q.8, and Q.9.

**Section – I**

- Q.2 Write detailed note on** **12**  
a) Construction and use of Automatic level  
b) Differentiate between Direct and Indirect methods of Contouring  
c) Explain the methods of interpolation of contours
- Q.3 Explain** **08**  
a) Construction of vernier theodolite with parts  
b) Use of theodolite for measurement of horizontal angle using reiteration method
- Q.4 Explain** **08**  
a) Construction of Digital level  
b) Construction of Total station
- Q.5 Write notes on** **08**  
a) Geodimeter  
b) Tellurometer

**Section – II**

- Q.6 Write detailed notes on** **12**  
a) Space Segment of GPS  
b) Differentiate between Static GPS and Differential GPS methods  
c) GPS receivers and their comparison
- Q.7 Explain** **08**  
a) Flight Planning for aerial photogrammetry  
b) Scale of vertical photographs and its classification
- Q.8 Write notes on** **08**  
a) LiDAR and its advantages  
b) Drone surveying and its advantages over satellite remote sensing
- Q.9 Explain** **08**  
a) Electromagnetic Spectrum  
b) Compare the Raster images with Vector images



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**Set S**

**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surveying & Geomatics**

Day & Date: Monday, 13-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The instrument using modulated light waves are known as \_\_\_\_\_.
  - a) Geodimeter
  - b) Tellurometer
  - c) Distometer
  - d) All the above
- 2) A total station is a combination of \_\_\_\_\_.
  - a) Electronic theodolite, EDM only
  - b) Vernier theodolite, EDM only
  - c) Electronic theodolite, Microprocessor only
  - d) Electronic theodolite, EDM, Microprocessor
- 3) Minimum how many satellites shall be accessible for user to get latitude, longitude, altitude, and time measurements in Global Positioning System?
  - a) 3
  - b) 4
  - c) 8
  - d) 24
- 4) In terrestrial photogrammetry photographs are taken by \_\_\_\_\_.
  - a) Arial camera
  - b) Drone
  - c) Phototheodolite
  - d) Satellite
- 5) LiDAR is \_\_\_\_\_.
  - a) Active remote sensing system
  - b) Passive remote sensing system
  - c) Both Active as well as Passive remote system
  - d) None of these
- 6) Drone can provide \_\_\_\_\_.
  - a) a satisfactory means of performing the required survey in large scale projects
  - b) a satisfactory means of performing projects where access is difficult
  - c) Both survey in large scale projects as well as of performing projects where access is difficult
  - d) None of these

- 7) Remote sensing in which energy from sun is used is \_\_\_\_\_  
a) Active Remote sensing  
b) Passive remote sensing  
c) Both active and passive remote sensing  
d) None of these
- 8) Following are components of GIS \_\_\_\_\_  
a) Hardware  
b) Software  
c) Users  
d) All of the above
- 9) Following survey is required for route survey \_\_\_\_\_  
a) Profile leveling  
b) Triangulation  
c) Theodolite traversing  
d) None of these
- 10) In a tilting level, while taking the sight to a leveling staff, the centering of bubble is done by \_\_\_\_\_.  
a) Foot screws  
b) Tilting screw  
c) Focusing screw  
d) Tripod legs
- 11) The vertical distance between any two consecutive contours is called \_\_\_\_ (complete the sentence using correct option)  
a) Horizontal equivalent  
b) Contour interval  
c) Height of instrument  
d) Contour gradient
- 12) The theodolite is designed for precise measurement of following.  
a) Both Horizontal and Vertical Distance  
b) Difference in level  
c) Both Horizontal and Vertical Angle  
d) Coordinates of stations
- 13) The total latitude and departure of any point with respect to a common origin are known as \_\_\_\_\_.  
a) Consecutive coordinates  
b) Independent coordinates  
c) Geodetic coordinates  
d) Cartesian coordinates
- 14) In Digital level the field book is \_\_\_\_\_.  
a) Printed on pages in a notebook  
b) Digital on a PC  
c) Digital in a laptop  
d) Digital in microprocessor of level

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Surveying & Geomatics**

Day & Date: Monday, 13-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) In Section – I, Q. 2 is compulsory; answer any two questions out of Q.3, Q.4, and Q.5.  
2) In Section – II, Q. 6 is compulsory; answer any two questions out of Q.7, Q.8, and Q.9.

**Section – I**

- Q.2 Write detailed note on** **12**  
a) Construction and use of Automatic level  
b) Differentiate between Direct and Indirect methods of Contouring  
c) Explain the methods of interpolation of contours
- Q.3 Explain** **08**  
a) Construction of vernier theodolite with parts  
b) Use of theodolite for measurement of horizontal angle using reiteration method
- Q.4 Explain** **08**  
a) Construction of Digital level  
b) Construction of Total station
- Q.5 Write notes on** **08**  
a) Geodimeter  
b) Tellurometer

**Section – II**

- Q.6 Write detailed notes on** **12**  
a) Space Segment of GPS  
b) Differentiate between Static GPS and Differential GPS methods  
c) GPS receivers and their comparison
- Q.7 Explain** **08**  
a) Flight Planning for aerial photogrammetry  
b) Scale of vertical photographs and its classification
- Q.8 Write notes on** **08**  
a) LiDAR and its advantages  
b) Drone surveying and its advantages over satellite remote sensing
- Q.9 Explain** **08**  
a) Electromagnetic Spectrum  
b) Compare the Raster images with Vector images

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- 9) In perspective projection, all lines of sight start at a \_\_\_\_\_ point.
- |             |           |
|-------------|-----------|
| a) Double   | b) Triple |
| c) Multiple | d) Single |
- 10) The \_\_\_\_\_ plays an important role in the comfort of persons affected by ventilation system.
- |                    |                       |
|--------------------|-----------------------|
| a) Carbon monoxide | b) Purity of air      |
| c) Volume of room  | d) Health of occupant |
- 11) The \_\_\_\_\_ consists of equal volume of lime and sand.
- |                  |             |
|------------------|-------------|
| a) Cement Mortar | b) Concrete |
| c) Lime Mortar   | d) Slurry   |
- 12) The term \_\_\_\_\_ is used to describe the thin plastic covering that is applied on the surface of walls and ceilings.
- |             |                     |
|-------------|---------------------|
| a) Grouting | b) Plastering       |
| c) Pointing | d) All of the above |
- 13) The main objective of applying \_\_\_\_\_ to the plastered surfaces is to create a smooth surface.
- |        |              |
|--------|--------------|
| a) Gum | b) Varnish   |
| c) POP | d) Distemper |
- 14) The \_\_\_\_\_ varnishes dry slowly, but they form hard and durable surface.
- |          |               |
|----------|---------------|
| a) Oil   | b) Spirit     |
| c) Water | d) Turpentine |

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| Set | P |
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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Building Construction & Drawing**

Day & Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 06:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 28**

- a) Write down about "Building Functional Requirements".
- b) Differentiate between "Framed and Load Bearing and Composite structure".
- c) Explain in steps wise a "Design of Staircase" for building with neat sketch.
- d) Explain in brief "Natural Ventilation and Artificial Ventilation" with the good significance of it.
- e) Enlist and explain the various types of pointing with neat sketch.

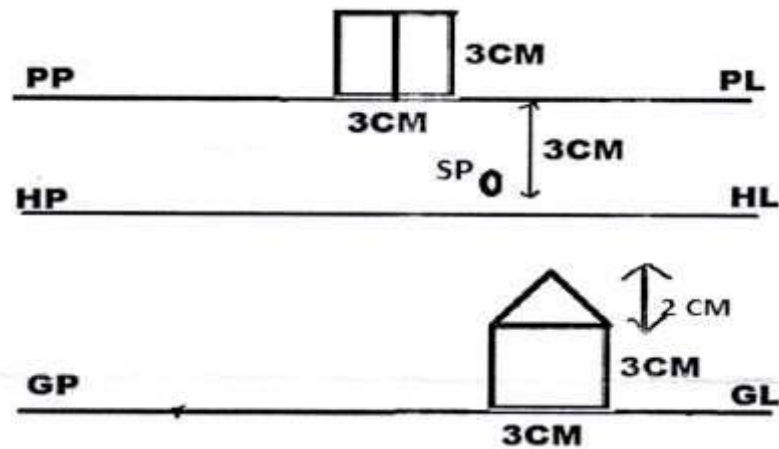
**Section – II**

**Q.3 Answer the following question. (Any One) 18**

- a) Draw to a scale of 1:10 front view and vertical sectional elevation of a double leaf panelled door for the following data  
(All the dimensions are in mm)
  - 1) Clear opening = 1000 x 2100
  - 2) Cross section of the frame = 100 x 80
  - 3) Vertical stiles = 100 x 40
  - 4) Top rail = 100 x 35
  - 5) Frieze rail = 100 x 35
  - 6) Lock rail = 190 x 40
  - 7) Bottom rail = 160 x 40
  - 8) No. of panels = 6 (25 mm thick)
- b) Design and draw a suitable Dog Legged Staircase for residential building using the following data.  
(All the dimensions are in mm)
  - 1) Floor to Floor height: 3000
  - 2) Riser: 150 and Tread: 300
  - 3) Wall Thickness 230
  - 4) Fight width: 1200
  - 5) Waist Slab: 150
 Assume Suitable data if necessary
  - i) Draw detailed plan (1:20)
  - ii) Sectional elevation (1:20)

**Q.4 Answer the following question. (Any Two)**

- a)** Draw to a scale of 1:10 plans for alternate course and elevation for at least 10 courses for a brick wall built with.
- 1) Stretcher bond (01 brick thick)
  - 2) Take brick size as (100x100x200) mm including mortar joints
- b)** Draw a neat sketch type of arches based on number of centre's
- 1) One-centred Arches
  - 2) Two-centred Arches
  - 3) Three-centred Arches
  - 4) Four-centred Arches
- c)** Construct the perspective image of below object. Take Scale as 1:1



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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Building Construction & Drawing**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 06:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
  - 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
  - 3) Figures to the right indicates full marks
  - 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The term \_\_\_\_\_ is used to mean the free passage of clean air in a Structure.
 

|                 |                |
|-----------------|----------------|
| a) Condensation | b) Dissipation |
| c) Circulation  | d) Ventilation |
- 2) In perspective projection, all lines of sight start at a \_\_\_\_\_ point.
 

|             |           |
|-------------|-----------|
| a) Double   | b) Triple |
| c) Multiple | d) Single |
- 3) The \_\_\_\_\_ plays an important role in the comfort of persons affected by ventilation system.
 

|                    |                       |
|--------------------|-----------------------|
| a) Carbon monoxide | b) Purity of air      |
| c) Volume of room  | d) Health of occupant |
- 4) The \_\_\_\_\_ consists of equal volume of lime and sand.
 

|                  |             |
|------------------|-------------|
| a) Cement Mortar | b) Concrete |
| c) Lime Mortar   | d) Slurry   |
- 5) The term \_\_\_\_\_ is used to describe the thin plastic covering that is applied on the surface of walls and ceilings.
 

|             |                     |
|-------------|---------------------|
| a) Grouting | b) Plastering       |
| c) Pointing | d) All of the above |
- 6) The main objective of applying \_\_\_\_\_ to the plastered surfaces is to create a smooth surface.
 

|        |              |
|--------|--------------|
| a) Gum | b) Varnish   |
| c) POP | d) Distemper |
- 7) The \_\_\_\_\_ varnishes dry slowly, but they form hard and durable surface.
 

|          |               |
|----------|---------------|
| a) Oil   | b) Spirit     |
| c) Water | d) Turpentine |
- 8) \_\_\_\_\_ in a building means the free passage of clean air in a building.
 

|               |                |
|---------------|----------------|
| a) Habitation | b) Protection  |
| c) Sanitation | d) Ventilation |



- Page 6 of 16

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Building Construction & Drawing**

Day & Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 06:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 28**

- a) Write down about "Building Functional Requirements".
- b) Differentiate between "Framed and Load Bearing and Composite structure".
- c) Explain in steps wise a "Design of Staircase" for building with neat sketch.
- d) Explain in brief "Natural Ventilation and Artificial Ventilation" with the good significance of it.
- e) Enlist and explain the various types of pointing with neat sketch.

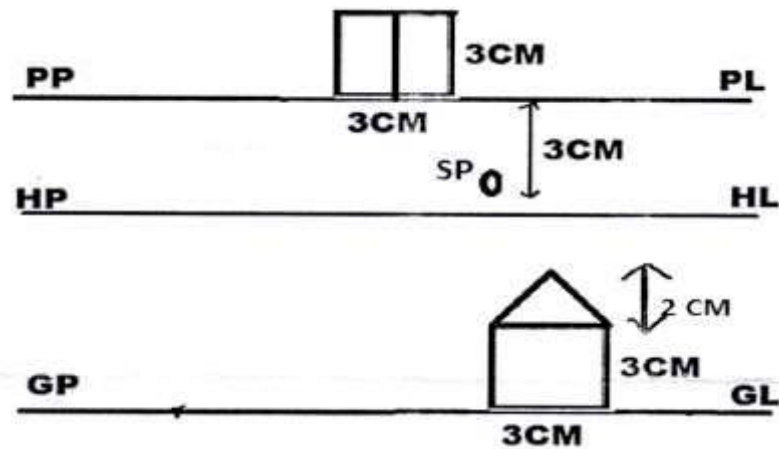
**Section – II**

**Q.3 Answer the following question. (Any One) 18**

- a) Draw to a scale of 1:10 front view and vertical sectional elevation of a double leaf panelled door for the following data  
(All the dimensions are in mm)
  - 1) Clear opening = 1000 x 2100
  - 2) Cross section of the frame = 100 x 80
  - 3) Vertical stiles = 100 x 40
  - 4) Top rail = 100 x 35
  - 5) Frieze rail = 100 x 35
  - 6) Lock rail = 190 x 40
  - 7) Bottom rail = 160 x 40
  - 8) No. of panels = 6 (25 mm thick)
- b) Design and draw a suitable Dog Legged Staircase for residential building using the following data.  
(All the dimensions are in mm)
  - 1) Floor to Floor height: 3000
  - 2) Riser: 150 and Tread: 300
  - 3) Wall Thickness 230
  - 4) Fight width: 1200
  - 5) Waist Slab: 150
 Assume Suitable data if necessary
  - i) Draw detailed plan (1:20)
  - ii) Sectional elevation (1:20)

**Q.4 Answer the following question. (Any Two)**

- a)** Draw to a scale of 1:10 plans for alternate course and elevation for at least 10 courses for a brick wall built with.
- 1) Stretcher bond (01 brick thick)
  - 2) Take brick size as (100x100x200) mm including mortar joints
- b)** Draw a neat sketch type of arches based on number of centre's
- 1) One-centred Arches
  - 2) Two-centred Arches
  - 3) Three-centred Arches
  - 4) Four-centred Arches
- c)** Construct the perspective image of below object. Take Scale as 1:1



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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Building Construction & Drawing**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 06:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The \_\_\_\_\_ consists of equal volume of lime and sand.
 

|                  |             |
|------------------|-------------|
| a) Cement Mortar | b) Concrete |
| c) Lime Mortar   | d) Slurry   |
- 2) The term \_\_\_\_\_ is used to describe the thin plastic covering that is applied on the surface of walls and ceilings.
 

|             |                     |
|-------------|---------------------|
| a) Grouting | b) Plastering       |
| c) Pointing | d) All of the above |
- 3) The main objective of applying \_\_\_\_\_ to the plastered surfaces is to create a smooth surface.
 

|        |              |
|--------|--------------|
| a) Gum | b) Varnish   |
| c) POP | d) Distemper |
- 4) The \_\_\_\_\_ varnishes dry slowly, but they form hard and durable surface.
 

|          |               |
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| a) Oil   | b) Spirit     |
| c) Water | d) Turpentine |
- 5) \_\_\_\_\_ in a building means the free passage of clean air in a building.
 

|               |                |
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| a) Habitation | b) Protection  |
| c) Sanitation | d) Ventilation |
- 6) The part of a building constructed below ground level is known as \_\_\_\_\_.
 

|             |                   |
|-------------|-------------------|
| a) Plinth   | b) Superstructure |
| c) Basement | d) Foundation     |
- 7) The foundation in which the loading on the soil remains practically the same after the construction of the building is known as \_\_\_\_\_.
 

|                    |                             |
|--------------------|-----------------------------|
| a) Step foundation | b) Grillage foundation      |
| c) Raft foundation | d) Inverted arch foundation |
- 8) The term \_\_\_\_\_ is used to indicate the art of building the structures in Stones.
 

|            |           |
|------------|-----------|
| a) Masonry | b) Mortar |
| c) Brick   | d) Bond   |

- 9) Brick cut in length wise is called as \_\_\_\_\_.
  - a) Queen Closer
  - b) King closer
  - c) Bevelled closer
  - d) Mitred closer
- 10) Which of the following components of a door is an assembly of horizontal and vertical members?
  - a) Shutter
  - b) Frame
  - c) Frog
  - d) Nogging
- 11) The length of the horn is \_\_\_\_\_.
  - a) 35-70 CM
  - b) 25-45 CM
  - c) 10-15 CM
  - d) 45-25 CM
- 12) The term \_\_\_\_\_ is used to mean the free passage of clean air in a Structure.
  - a) Condensation
  - b) Dissipation
  - c) Circulation
  - d) Ventilation
- 13) In perspective projection, all lines of sight start at a \_\_\_\_\_ point.
  - a) Double
  - b) Triple
  - c) Multiple
  - d) Single
- 14) The \_\_\_\_\_ plays an important role in the comfort of persons affected by ventilation system.
  - a) Carbon monoxide
  - b) Purity of air
  - c) Volume of room
  - d) Health of occupant

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Building Construction & Drawing**

Day & Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 06:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 28**

- a) Write down about "Building Functional Requirements".
- b) Differentiate between "Framed and Load Bearing and Composite structure".
- c) Explain in steps wise a "Design of Staircase" for building with neat sketch.
- d) Explain in brief "Natural Ventilation and Artificial Ventilation" with the good significance of it.
- e) Enlist and explain the various types of pointing with neat sketch.

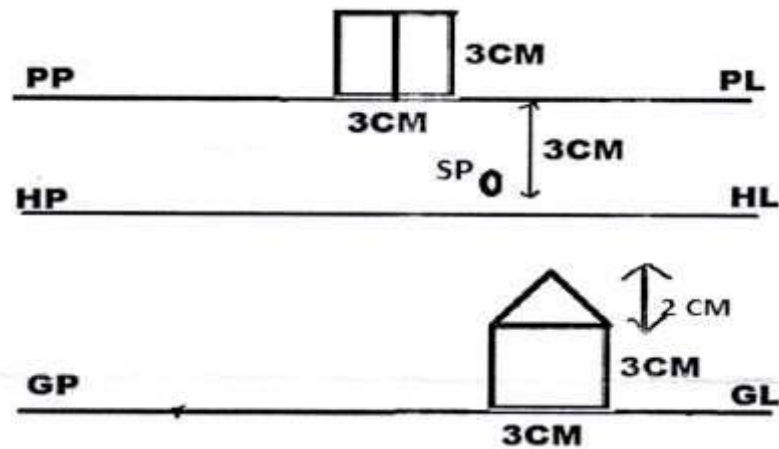
**Section – II**

**Q.3 Answer the following question. (Any One) 18**

- a) Draw to a scale of 1:10 front view and vertical sectional elevation of a double leaf panelled door for the following data  
(All the dimensions are in mm)
  - 1) Clear opening = 1000 x 2100
  - 2) Cross section of the frame = 100 x 80
  - 3) Vertical stiles = 100 x 40
  - 4) Top rail = 100 x 35
  - 5) Frieze rail = 100 x 35
  - 6) Lock rail = 190 x 40
  - 7) Bottom rail = 160 x 40
  - 8) No. of panels = 6 (25 mm thick)
- b) Design and draw a suitable Dog Legged Staircase for residential building using the following data.  
(All the dimensions are in mm)
  - 1) Floor to Floor height: 3000
  - 2) Riser: 150 and Tread: 300
  - 3) Wall Thickness 230
  - 4) Fight width: 1200
  - 5) Waist Slab: 150
 Assume Suitable data if necessary
  - i) Draw detailed plan (1:20)
  - ii) Sectional elevation (1:20)

**Q.4 Answer the following question. (Any Two)**

- a)** Draw to a scale of 1:10 plans for alternate course and elevation for at least 10 courses for a brick wall built with.
- 1) Stretcher bond (01 brick thick)
  - 2) Take brick size as (100x100x200) mm including mortar joints
- b)** Draw a neat sketch type of arches based on number of centre's
- 1) One-centred Arches
  - 2) Two-centred Arches
  - 3) Three-centred Arches
  - 4) Four-centred Arches
- c)** Construct the perspective image of below object. Take Scale as 1:1



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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Building Construction & Drawing**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 06:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following components of a door is an assembly of horizontal and vertical members?
 

|            |            |
|------------|------------|
| a) Shutter | b) Frame   |
| c) Frog    | d) Nogging |
- 2) The length of the horn is \_\_\_\_\_.
 

|             |             |
|-------------|-------------|
| a) 35-70 CM | b) 25-45 CM |
| c) 10-15 CM | d) 45-25 CM |
- 3) The term \_\_\_\_\_ is used to mean the free passage of clean air in a Structure.
 

|                 |                |
|-----------------|----------------|
| a) Condensation | b) Dissipation |
| c) Circulation  | d) Ventilation |
- 4) In perspective projection, all lines of sight start at a \_\_\_\_\_ point.
 

|             |           |
|-------------|-----------|
| a) Double   | b) Triple |
| c) Multiple | d) Single |
- 5) The \_\_\_\_\_ plays an important role in the comfort of persons affected by ventilation system.
 

|                    |                       |
|--------------------|-----------------------|
| a) Carbon monoxide | b) Purity of air      |
| c) Volume of room  | d) Health of occupant |
- 6) The \_\_\_\_\_ consists of equal volume of lime and sand.
 

|                  |             |
|------------------|-------------|
| a) Cement Mortar | b) Concrete |
| c) Lime Mortar   | d) Slurry   |
- 7) The term \_\_\_\_\_ is used to describe the thin plastic covering that is applied on the surface of walls and ceilings.
 

|             |                     |
|-------------|---------------------|
| a) Grouting | b) Plastering       |
| c) Pointing | d) All of the above |
- 8) The main objective of applying \_\_\_\_\_ to the plastered surfaces is to create a smooth surface.
 

|        |              |
|--------|--------------|
| a) Gum | b) Varnish   |
| c) POP | d) Distemper |



- 9) The \_\_\_\_\_ varnishes dry slowly, but they form hard and durable surface.  
a) Oil  
b) Spirit  
c) Water  
d) Turpentine
- 10) \_\_\_\_\_ in a building means the free passage of clean air in a building.  
a) Habitation  
b) Protection  
c) Sanitation  
d) Ventilation
- 11) The part of a building constructed below ground level is known as \_\_\_\_\_.  
a) Plinth  
b) Superstructure  
c) Basement  
d) Foundation
- 12) The foundation in which the loading on the soil remains practically the same after the construction of the building is known as \_\_\_\_\_.  
a) Step foundation  
b) Grillage foundation  
c) Raft foundation  
d) Inverted arch foundation
- 13) The term \_\_\_\_\_ is used to indicate the art of building the structures in Stones.  
a) Masonry  
b) Mortar  
c) Brick  
d) Bond
- 14) Brick cut in length wise is called as \_\_\_\_\_.  
a) Queen Closer  
b) King closer  
c) Bevelled closer  
d) Mitred closer

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Building Construction & Drawing**

Day & Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 06:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 28**

- a) Write down about "Building Functional Requirements".
- b) Differentiate between "Framed and Load Bearing and Composite structure".
- c) Explain in steps wise a "Design of Staircase" for building with neat sketch.
- d) Explain in brief "Natural Ventilation and Artificial Ventilation" with the good significance of it.
- e) Enlist and explain the various types of pointing with neat sketch.

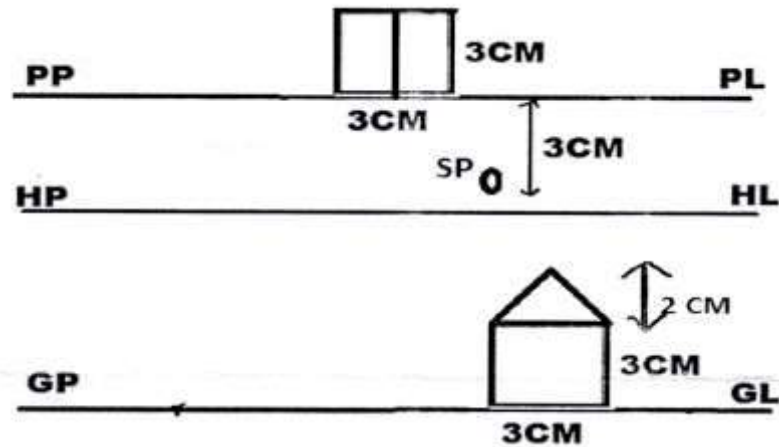
**Section – II**

**Q.3 Answer the following question. (Any One) 18**

- a) Draw to a scale of 1:10 front view and vertical sectional elevation of a double leaf panelled door for the following data  
(All the dimensions are in mm)
  - 1) Clear opening = 1000 x 2100
  - 2) Cross section of the frame = 100 x 80
  - 3) Vertical stiles = 100 x 40
  - 4) Top rail = 100 x 35
  - 5) Frieze rail = 100 x 35
  - 6) Lock rail = 190 x 40
  - 7) Bottom rail = 160 x 40
  - 8) No. of panels = 6 (25 mm thick)
- b) Design and draw a suitable Dog Legged Staircase for residential building using the following data.  
(All the dimensions are in mm)
  - 1) Floor to Floor height: 3000
  - 2) Riser: 150 and Tread: 300
  - 3) Wall Thickness 230
  - 4) Fight width: 1200
  - 5) Waist Slab: 150
 Assume Suitable data if necessary
  - i) Draw detailed plan (1:20)
  - ii) Sectional elevation (1:20)

**Q.4 Answer the following question. (Any Two)**

- a) Draw to a scale of 1:10 plans for alternate course and elevation for at least 10 courses for a brick wall built with.
- 1) Stretcher bond (01 brick thick)
  - 2) Take brick size as (100x100x200) mm including mortar joints
- b) Draw a neat sketch type of arches based on number of centre's
- 1) One-centred Arches
  - 2) Two-centred Arches
  - 3) Three-centred Arches
  - 4) Four-centred Arches
- c) Construct the perspective image of below object. Take Scale as 1:1



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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Fluid Mechanics and Fluid Machines**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) A \_\_\_\_\_ line is an imaginary line within the flow so that the tangent at any point on it indicates velocity at that point.
 

|                |                      |
|----------------|----------------------|
| a) Streak line | b) stream line       |
| c) path line   | d) none of the above |
- 2) The flow in a pipe whose valve being opened or closed gradually is an example of \_\_\_\_\_.
 

|                    |                      |
|--------------------|----------------------|
| a) steady flow     | b) unsteady flow     |
| c) rotational flow | d) compressible flow |
- 3) A real practical fluid possesses which of the following?
 

|              |                    |
|--------------|--------------------|
| a) viscosity | b) surface tension |
| c) density   | d) all the above   |
- 4) For a submerged body, if centre of buoyancy is above than C.G. of the body, the body will remain in the state of \_\_\_\_\_.
 

|                         |                        |
|-------------------------|------------------------|
| a) stable equilibrium   | b) neutral equilibrium |
| c) unstable equilibrium | d) any of the above    |
- 5) The continuity equation is based on the principle of \_\_\_\_\_.
 

|                             |                         |
|-----------------------------|-------------------------|
| a) conservation of momentum | b) conservation of mass |
| c) conservation of energy   | d) none of the above    |
- 6) The height of free surface above point is known as \_\_\_\_\_.
 

|                        |                          |
|------------------------|--------------------------|
| a) static head         | b) intensity of pressure |
| c) either of the above | d) none of the above     |
- 7) An error of 1% in measuring H will produce... error in discharges over a rectangular notch or weir.
 

|       |         |
|-------|---------|
| a) 1% | b) 1.5% |
| c) 2% | d) 2.5% |
- 8) The hydraulic grade line is \_\_\_\_\_.
 

|                                                      |
|------------------------------------------------------|
| a) always above the energy grade line                |
| b) the velocity head below the energy grade line     |
| c) always above the closed conduit                   |
| d) always slopping downward in the direction of flow |

- 9) The head loss in turbulent flow in pipe
- a) Varies directly as the velocity
  - b) Varies inversely as the square of the velocity
  - c) Varies inversely as the square of the diameter
  - d) Varies approximately as the square of the velocity
- 10) Following is not a minor head loss
- a) loss at exit of pipe
  - b) loss at entrance of pipe
  - c) friction loss
  - d) none of these
- 11) Consider the following statements:
- 1) Pelton wheel is a tangential flow impulse turbine
  - 2) Francis turbine is an axial flow reaction turbine.
  - 3) Kaplan turbine is a radial flow reaction turbine.
- Which of the above statements is/are correct?
- a) 1 and 3
  - b) 1 alone
  - c) 2 alone
  - d) 3 alone
- 12) Specific speed of an impulse turbine (Pelton wheel) ranges from
- a) 12 to 70
  - b) 80 to 400
  - c) 300 to 1000
  - d) 1000 to 1200
- 13) A centrifugal pump is taking much of power, the probable reason may be
- a) liquid being pumped is heavy
  - b) speed of the pump is low
  - c) there is leakage of air
  - d) Ineffective strainer and foot valve arrangement
- 14) The flow ratio in case of a centrifugal pump varies from
- a) 0.40 to 0.50
  - b) 0.25 to 0.40
  - c) 0.1 to 0.25
  - d) 0.50 to 0.65

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Set **P**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Fluid Mechanics and Fluid Machines**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve all question from Section - I.  
 2) Section – II Q.No.5 is compulsory and Q. No. 6 to Q. No. 8 any two from the remaining question.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programmable calculator is allowed.  
 5) Assume correct data wherever necessary.

**Section – I**

- Q.2 a)** Define and Write The Units **04**  
 1) Viscosity  
 2) Specific Gravity  
 3) Compressibility  
 4) Capillarity
- b)** Calculate the capillary rise in a glass tube of 2.5 mm diameter when immersed vertically in (a) water and (b) mercury. Take  $\sigma = 0.0725 \text{ N/m}$  for water and  $\sigma = 0.52 \text{ N/m}$  for mercury. The angle of contact for water is zero and for mercury  $130^\circ$ . **04**
- Q.3 Attempt any two.** **10**  
**a)** A uniform body of size 3m long, 2m wide and 1m deep floats in water. What is the weight of body if depth of immersion is 0.8m? Determine the metacentric height also.  
**b)** A rectangular plate 3 m long and 1 m wide is immersed vertically in water in such a way that 3 m side is parallel to water surface and 1 m below it. Determine;  
 1) Total pressure on the plate  
 2) Centre of plate  
**c)** State and prove Pascal's law
- Q.4 Attempt any two.** **10**  
**a)** Find the discharge of water flowing over a rectangular notch of 2.5m length when the constant head over the notch is 400mm. Take  $C_d = 0.62$ .  
**b)** Derive Bernoulli's theorem for steady flow of an incompressible fluid and state assumptions made for the derivation.  
**c)** The stream function is given by  $\psi = 5x - 6y$ . Calculate the velocity components. Also find magnitude and direction of the resultant velocity at any point.

**Section – II**

- Q.5** a) Write short note on i) Surge Tank ii) Water Hammer. **05**  
 b) Show that frictional torque  $\tau$  of a disc of diameter  $D$  at a speed  $N$  is in fluid of viscosity  $\mu$  and density  $\rho$  in a turbulent flow is given by **05**  

$$\tau = D^5 N^2 \rho \Phi[\mu/D^2 N \rho]$$
- Q.6** a) What is mean by turbine? Give detailed classification of turbines. **05**  
 b) What is mean by dimensional analysis? what are its uses? **04**
- Q.7** a) Derive an expression for force exerted by a jet on stationary curved plate, when jet strikes at centre of symmetrical curved plate. **05**  
 b) A centrifugal pump delivers water against a net head of 15 m and design speed of 1100 rpm. The vane angle is  $30^\circ$  curved back. If the impeller diameter is 320 mm and outlet width is 60 mm. Determine discharge of pump if manometric efficiency is 96%. **04**
- Q.8** a) Determine the difference in elevation between water surfaces in two tanks which are connected by horizontal pipe of diameter 50cm and length 15m. The discharge through the pipe is 600 lps. Consider all losses and assume  $f=0.04$  **05**  
 b) With neat sketch explain various types of heads available for Centrifugal Pumps. **04**

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Fluid Mechanics and Fluid Machines**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The hydraulic grade line is \_\_\_\_\_.
  - a) always above the energy grade line
  - b) the velocity head below the energy grade line
  - c) always above the closed conduit
  - d) always slopping downward in the direction of flow
- 2) The head loss in turbulent flow in pipe
  - a) Varies directly as the velocity
  - b) Varies inversely as the square of the velocity
  - c) Varies inversely as the square of the diameter
  - d) Varies approximately as the square of the velocity
- 3) Following is not a minor head loss
 

|                         |                             |
|-------------------------|-----------------------------|
| a) loss at exit of pipe | b) loss at entrance of pipe |
| c) friction loss        | d) none of these            |
- 4) Consider the following statements:
  - 1) Pelton wheel is a tangential flow impulse turbine
  - 2) Francis turbine is an axial flow reaction turbine.
  - 3) Kaplan turbine is a radial flow reaction turbine.
 Which of the above statements is/are correct?
 

|            |            |
|------------|------------|
| a) 1 and 3 | b) 1 alone |
| c) 2 alone | d) 3 alone |
- 5) Specific speed of an impulse turbine (Pelton wheel) ranges from
 

|                |                 |
|----------------|-----------------|
| a) 12 to 70    | b) 80 to 400    |
| c) 300 to 1000 | d) 1000 to 1200 |
- 6) A centrifugal pump is taking much of power, the probable reason may be
  - a) liquid being pumped is heavy
  - b) speed of the pump is low
  - c) there is leakage of air
  - d) Ineffective strainer and foot valve arrangement
- 7) The flow ratio in case of a centrifugal pump varies from
 

|                 |                 |
|-----------------|-----------------|
| a) 0.40 to 0.50 | b) 0.25 to 0.40 |
| c) 0.1 to 0.25  | d) 0.50 to 0.65 |



- 8) A \_\_\_\_\_ line is an imaginary line within the flow so that the tangent at any point on it indicates velocity at that point.
- a) Streak line
  - b) stream line
  - c) path line
  - d) none of the above
- 9) The flow in a pipe whose valve being opened or closed gradually is an example of \_\_\_\_\_.
- a) steady flow
  - b) unsteady flow
  - c) rotational flow
  - d) compressible flow
- 10) A real practical fluid possesses which of the following?
- a) viscosity
  - b) surface tension
  - c) density
  - d) all the above
- 11) For a submerged body, if centre of buoyancy is above than C.G. of the body, the body will remain in the state of \_\_\_\_\_.
- a) stable equilibrium
  - b) neutral equilibrium
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  - d) any of the above
- 12) The continuity equation is based on the principle of \_\_\_\_\_.
- a) conservation of momentum
  - b) conservation of mass
  - c) conservation of energy
  - d) none of the above
- 13) The height of free surface above point is known as \_\_\_\_\_.
- a) static head
  - b) intensity of pressure
  - c) either of the above
  - d) none of the above
- 14) An error of 1% in measuring H will produce... error in discharges over a rectangular notch or weir.
- a) 1%
  - b) 1.5%
  - c) 2%
  - d) 2.5%

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Fluid Mechanics and Fluid Machines**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve all question from Section - I.  
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**Section – I**

- Q.2 a)** Define and Write The Units **04**  
 1) Viscosity  
 2) Specific Gravity  
 3) Compressibility  
 4) Capillarity
- b)** Calculate the capillary rise in a glass tube of 2.5 mm diameter when immersed vertically in (a) water and (b) mercury. Take  $\sigma = 0.0725 \text{ N/m}$  for water and  $\sigma = 0.52 \text{ N/m}$  for mercury. The angle of contact for water is zero and for mercury  $130^\circ$ . **04**
- Q.3 Attempt any two.** **10**  
**a)** A uniform body of size 3m long, 2m wide and 1m deep floats in water. What is the weight of body if depth of immersion is 0.8m? Determine the metacentric height also.  
**b)** A rectangular plate 3 m long and 1 m wide is immersed vertically in water in such a way that 3 m side is parallel to water surface and 1 m below it. Determine;  
 1) Total pressure on the plate  
 2) Centre of plate  
**c)** State and prove Pascal's law
- Q.4 Attempt any two.** **10**  
**a)** Find the discharge of water flowing over a rectangular notch of 2.5m length when the constant head over the notch is 400mm. Take  $C_d = 0.62$ .  
**b)** Derive Bernoulli's theorem for steady flow of an incompressible fluid and state assumptions made for the derivation.  
**c)** The stream function is given by  $\psi = 5x - 6y$ . Calculate the velocity components. Also find magnitude and direction of the resultant velocity at any point.

## Section – II

- Q.5** a) Write short note on i) Surge Tank ii) Water Hammer. **05**  
 b) Show that frictional torque  $\tau$  of a disc of diameter  $D$  at a speed  $N$  is in fluid of viscosity  $\mu$  and density  $\rho$  in a turbulent flow is given by **05**  

$$\tau = D^5 N^2 \rho \Phi[\mu/D^2 N \rho]$$
- Q.6** a) What is mean by turbine? Give detailed classification of turbines. **05**  
 b) What is mean by dimensional analysis? what are its uses? **04**
- Q.7** a) Derive an expression for force exerted by a jet on stationary curved plate, when jet strikes at centre of symmetrical curved plate. **05**  
 b) A centrifugal pump delivers water against a net head of 15 m and design speed of 1100 rpm. The vane angle is  $30^\circ$  curved back. If the impeller diameter is 320 mm and outlet width is 60 mm. Determine discharge of pump if manometric efficiency is 96%. **04**
- Q.8** a) Determine the difference in elevation between water surfaces in two tanks which are connected by horizontal pipe of diameter 50cm and length 15m. The discharge through the pipe is 600 lps. Consider all losses and assume  $f=0.04$  **05**  
 b) With neat sketch explain various types of heads available for Centrifugal Pumps. **04**

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Fluid Mechanics and Fluid Machines**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Consider the following statements:
  - 1) Pelton wheel is a tangential flow impulse turbine
  - 2) Francis turbine is an axial flow reaction turbine.
  - 3) Kaplan turbine is a radial flow reaction turbine.
 Which of the above statements is/are correct?
  - a) 1 and 3
  - b) 1 alone
  - c) 2 alone
  - d) 3 alone
- 2) Specific speed of an impulse turbine (Pelton wheel) ranges from
  - a) 12 to 70
  - b) 80 to 400
  - c) 300 to 1000
  - d) 1000 to 1200
- 3) A centrifugal pump is taking much of power, the probable reason may be
  - a) liquid being pumped is heavy
  - b) speed of the pump is low
  - c) there is leakage of air
  - d) Ineffective strainer and foot valve arrangement
- 4) The flow ratio in case of a centrifugal pump varies from
  - a) 0.40 to 0.50
  - b) 0.25 to 0.40
  - c) 0.1 to 0.25
  - d) 0.50 to 0.65
- 5) A \_\_\_\_\_ line is an imaginary line within the flow so that the tangent at any point on it indicates velocity at that point.
  - a) Streak line
  - b) stream line
  - c) path line
  - d) none of the above
- 6) The flow in a pipe whose valve being opened or closed gradually is an example of \_\_\_\_\_.
  - a) steady flow
  - b) unsteady flow
  - c) rotational flow
  - d) compressible flow
- 7) A real practical fluid possesses which of the following?
  - a) viscosity
  - b) surface tension
  - c) density
  - d) all the above

- 8) For a submerged body, if centre of buoyancy is above than C.G. of the body, the body will remain in the state of \_\_\_\_\_.  
a) stable equilibrium                      b) neutral equilibrium  
c) unstable equilibrium                      d) any of the above
- 9) The continuity equation is based on the principle of \_\_\_\_\_.  
a) conservation of momentum              b) conservation of mass  
c) conservation of energy                      d) none of the above
- 10) The height of free surface above point is known as \_\_\_\_\_.  
a) static head                                      b) intensity of pressure  
c) either of the above                              d) none of the above
- 11) An error of 1% in measuring H will produce... error in discharges over a rectangular notch or weir.  
a) 1%                                                  b) 1.5%  
c) 2%                                                  d) 2.5%
- 12) The hydraulic grade line is \_\_\_\_\_.  
a) always above the energy grade line  
b) the velocity head below the energy grade line  
c) always above the closed conduit  
d) always slopping downward in the direction of flow
- 13) The head loss in turbulent flow in pipe  
a) Varies directly as the velocity  
b) Varies inversely as the square of the velocity  
c) Varies inversely as the square of the diameter  
d) Varies approximately as the square of the velocity
- 14) Following is not a minor head loss  
a) loss at exit of pipe                              b) loss at entrance of pipe  
c) friction loss                                      d) none of these

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Fluid Mechanics and Fluid Machines**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve all question from Section - I.  
 2) Section – II Q.No.5 is compulsory and Q. No. 6 to Q. No. 8 any two from the remaining question.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programmable calculator is allowed.  
 5) Assume correct data wherever necessary.

**Section – I**

- Q.2 a)** Define and Write The Units **04**  
 1) Viscosity  
 2) Specific Gravity  
 3) Compressibility  
 4) Capillarity
- b)** Calculate the capillary rise in a glass tube of 2.5 mm diameter when immersed vertically in (a) water and (b) mercury. Take  $\sigma = 0.0725 \text{ N/m}$  for water and  $\sigma = 0.52 \text{ N/m}$  for mercury. The angle of contact for water is zero and for mercury  $130^\circ$ . **04**
- Q.3 Attempt any two.** **10**  
**a)** A uniform body of size 3m long, 2m wide and 1m deep floats in water. What is the weight of body if depth of immersion is 0.8m? Determine the metacentric height also.  
**b)** A rectangular plate 3 m long and 1 m wide is immersed vertically in water in such a way that 3 m side is parallel to water surface and 1 m below it. Determine;  
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**c)** State and prove Pascal's law
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**c)** The stream function is given by  $\psi = 5x - 6y$ . Calculate the velocity components. Also find magnitude and direction of the resultant velocity at any point.

**Section – II**

- Q.5** a) Write short note on i) Surge Tank ii) Water Hammer. **05**  
 b) Show that frictional torque  $\tau$  of a disc of diameter  $D$  at a speed  $N$  is in fluid of viscosity  $\mu$  and density  $\rho$  in a turbulent flow is given by **05**  

$$\tau = D^5 N^2 \rho \Phi[\mu/D^2 N \rho]$$
- Q.6** a) What is mean by turbine? Give detailed classification of turbines. **05**  
 b) What is mean by dimensional analysis? what are its uses? **04**
- Q.7** a) Derive an expression for force exerted by a jet on stationary curved plate, when jet strikes at centre of symmetrical curved plate. **05**  
 b) A centrifugal pump delivers water against a net head of 15 m and design speed of 1100 rpm. The vane angle is  $30^\circ$  curved back. If the impeller diameter is 320 mm and outlet width is 60 mm. Determine discharge of pump if manometric efficiency is 96%. **04**
- Q.8** a) Determine the difference in elevation between water surfaces in two tanks which are connected by horizontal pipe of diameter 50cm and length 15m. The discharge through the pipe is 600 lps. Consider all losses and assume  $f=0.04$  **05**  
 b) With neat sketch explain various types of heads available for Centrifugal Pumps. **04**

# S

# Fluid Mechanics and Fluid Machines

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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Marks: 14

14

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**

**Fluid Mechanics and Fluid Machines**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve all question from Section - I.  
 2) Section – II Q.No.5 is compulsory and Q. No. 6 to Q. No. 8 any two from the remaining question.  
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**Section – I**

- Q.2 a)** Define and Write The Units **04**  
 1) Viscosity  
 2) Specific Gravity  
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- b)** Calculate the capillary rise in a glass tube of 2.5 mm diameter when immersed vertically in (a) water and (b) mercury. Take  $\sigma = 0.0725 \text{ N/m}$  for water and  $\sigma = 0.52 \text{ N/m}$  for mercury. The angle of contact for water is zero and for mercury  $130^\circ$ . **04**
- Q.3 Attempt any two.** **10**  
**a)** A uniform body of size 3m long, 2m wide and 1m deep floats in water. What is the weight of body if depth of immersion is 0.8m? Determine the metacentric height also.  
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b) Show that frictional torque  $\tau$  of a disc of diameter  $D$  at a speed  $N$  is in fluid of viscosity  $\mu$  and density  $\rho$  in a turbulent flow is given by **05**  
$$\tau = D^5 N^2 \rho \Phi[\mu/D^2 N \rho]$$
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**Seat  
No.**

Max. Marks: 70

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### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The elongation produced in a rod by its own weight of length "L" and diameter "D" rigidly fixed at the upper end and hanging is equal to \_\_\_\_\_.  
Where  
W = weight per unit volume of the rod  
E = Modulus of elasticity
  - a)  $WL / 2E$
  - b)  $WL^2 / 2E$
  - c)  $WL^3 / 2E$
  - d)  $WL^4 / 2E$
- 2) The modulus of elasticity E and bulk modulus K are related by \_\_\_\_\_.
  - a)  $K = mE / 3(m-2)$
  - b)  $K = mE / 2(m+1)$
  - c)  $K = 3(m-2) / mE$
  - d)  $K = 2(m+1) / mE$
- 3) The ultimate stress for a hollow steel column which carries an axial load of 1.9 MN is 480 N/mm<sup>2</sup> and working stress is 120 N/mm<sup>2</sup>. The factor of safety is \_\_\_\_\_.
  - a) 4
  - b) 0.25
  - c) 25
  - d) 2
- 4) A rectangular bar of cross-sectional area 10000 mm<sup>2</sup> is subjected to an axial load of 20 kN. The normal stress on a section which is inclined at an angle of 30° with normal cross section of the bar is \_\_\_\_\_.
  - a) 2 N/mm<sup>2</sup>
  - b) 1.5 N/mm<sup>2</sup>
  - c) 0.866 N/mm<sup>2</sup>
  - d) 2.866 N/mm<sup>2</sup>
- 5) If principal stresses in a two-dimensional case are -10 MPa and 20 MPa respectively, then maximum shear stress at the point is \_\_\_\_\_.
  - a) 10 MPa
  - b) 15 MPa
  - c) 20 MPa
  - d) 30 MPa
- 6) Pick the incorrect statement from the following four statements \_\_\_\_\_.
  - a) On the plane which carries maximum normal stress, the shear stress is zero
  - b) Principal planes are mutually orthogonal
  - c) On the plane which carries maximum shear stress, the normal stress is zero
  - d) The principal stress axes and principal strain axes coincide for an isotropic

- 7) Equivalent torque in a shaft subjected to axial load  $P$ , torque  $T$  and bending moment  $M$  is \_\_\_\_\_.  
 a)  $T_{eq} = (Pa^2 + M^2 + T^2)$                       b)  $T_{eq} = (Pa^2 + M^2 + T^2)^{0.5}$   
 c)  $T_{eq} = (M^2 + T^2)^{0.5}$                       d)  $T_{eq} = (M^2 + T^2)$
- 8) Maximum principal stress is equal to \_\_\_\_\_.  
 a)  $(\sigma_x + \sigma_y)/2 + [(\sigma_x - \sigma_y)^2 + \tau^2]^{0.5}$   
 b)  $(\sigma_x + \sigma_y)/2 + 0.5 [(\sigma_x - \sigma_y)^2 + \tau^2]^{0.5}$   
 c)  $(\sigma_x + \sigma_y)/2 + 0.5 [(\sigma_x - \sigma_y)^2 + 4\tau^2]^{0.5}$   
 d)  $(\sigma_x + \sigma_y)/2 + 0.5 [(\sigma_x - \sigma_y)^2 + 4\tau^2]$
- 9) A concentrated load  $P$  acts on a simply supported beam of span " $L$ " at a distance  $(L/3)$  from the left support. The bending moment at the point of application of the load is given by \_\_\_\_\_.  
 a)  $PL/3$                       b)  $2PL/3$   
 c)  $PL/9$                       d)  $2PL/9$
- 10) Shear force diagram of a cantilever beam with point load at free end is represented by \_\_\_\_\_.  
 a) Triangular                      b) Semi-circular  
 c) Rectangular                      d) Parabolic curve
- 11) When a beam is subjected to a bending moment the bending stress in a layer is \_\_\_\_\_ the distance from the neutral axis.  
 a) Independent of                      b) Directly proportional to  
 c) Inversely proportional to                      d) None of these
- 12) The section modulus of a rectangular section having width " $b$ " and depth " $d$ " about an axis through its C. G. and parallel to the base " $b$ " is \_\_\_\_\_.  
 a)  $bd^2 / 12$                       b)  $bd^2 / 4$   
 c)  $bd^2 / 6$                       d) None of these
- 13) In influence line diagrams (ILD):- \_\_\_\_\_.  
 a) Points change, position of loads remain fixed  
 b) Both points and position of load changes  
 c) Neither points nor position of load changes  
 d) Points remain fixed, position of load changes
- 14) What will be the shape of ILD curve for vertical reaction at left support for a simply supported beam?  
 a) Triangular                      b) Rectangular  
 c) Trapezoidal                      d) Cubic curve

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics-I**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section -I, Question No. 2 is compulsory, solve any two from the remaining.  
 2) In Section - II, Question No. 6 is compulsory, solve any two from the remaining.  
 3) Assume suitable data, if necessary and mention it clearly.  
 4) Figures to the right indicate full marks.

**Section – I**

- Q.2** The bar shown in fig-1, is subjected to a tensile load of 160 kN. If the stress in the middle portion is limited to  $150 \text{ N/mm}^2$ . Determine the diameter of the middle portion, find also the length of the middle portion, if the total elongation of the bar is to be 0.2 mm. young's modulus is given as  $2.1 \times 10^5 \text{ N/mm}^2$ . **10**

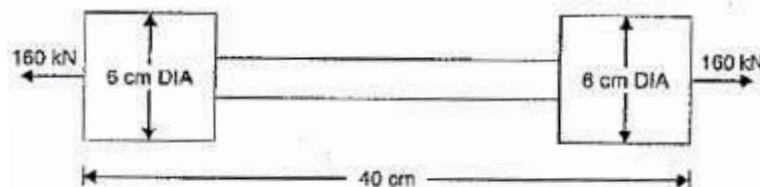


Fig.-1

- Q.3** A small block is 4 cm long, 3 cm high and 0.5 cm thick. It is subjected to uniformly distributed tensile forces of resultants 1200 N and 500 N as shown in fig.-2 compute the normal and shear stresses developed along the diagonal AB. **09**

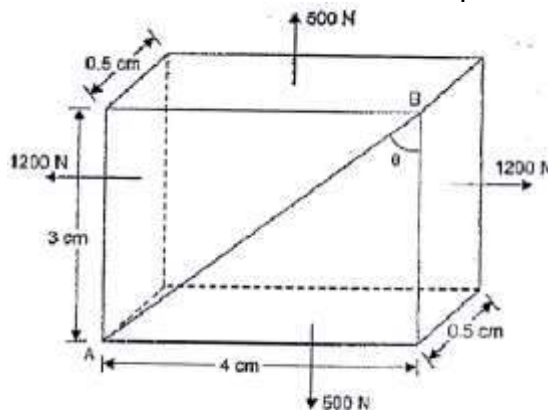


Fig.-2

- Q.4** A circular shaft transmits 60 kW at 2 Hz it is supported in bearings 3 m apart and at 1 m from one bearing, it carries a pulley exerting a transverse load of 36 kN on the shaft. Determine a suitable diameter for the shaft if. **09**
- a) The maximum direct stress is not to exceed  $100 \text{ N/mm}^2$ .
- b) The maximum shear stress is not to exceed  $50 \text{ N/mm}^2$ .
- Q.5** Determine the diameter of bolt which is subjected to an axial pull of 9 kN together with a transverse shear force of 4.5 kN using maximum principal stress theory. Given the elastic limit in tension =  $225 \text{ N/mm}^2$ , Factor of safety = 3, and Poisson's ratio = 0.3. **09**

### Section – II

- Q.6** Draw the shear force and bending moment diagrams of a simply supported beam of length 7 m carrying uniformly distributed load as shown in fig.-3. **10**

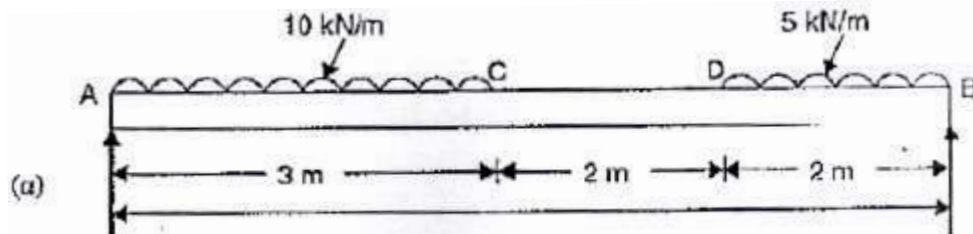


Fig.-3

- Q.7** A Timber beam of rectangular section of length 8 m is simply supported. The beam carries a UDL of  $12 \text{ kN/m}$  run over the entire length and a point load of 10 kN at 3 m from the left support. If the depth is two times the width and the stress in the timber is not to exceed  $8 \text{ N/mm}^2$ , find the suitable dimensions of the section. **09**
- Q.8** The shear force acting on a section of a beam is 50 kN. The section of the beam is of T-shaped of dimensions 100 mm x 100 mm x 20 mm as shown in fig.-4, the moment of inertia about the horizontal neutral axis is  $314.221 \times 10^4 \text{ mm}^4$ . Calculate the shear stress at the neutral axis and at the junction of the web and the flange. **09**

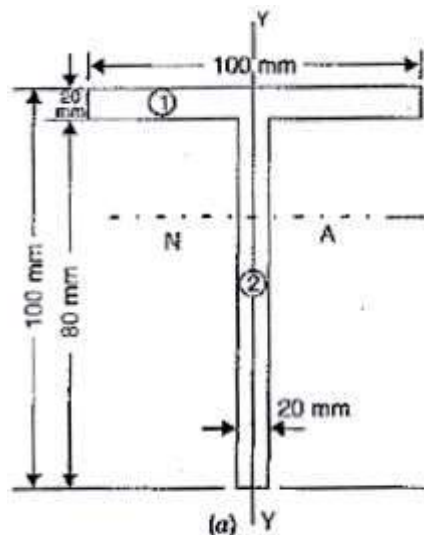


Fig.-4

- Q.9** Two-wheel loads 8 kN and 20 kN spaced at 2 m apart move along the span of girder of span 16 m. find the maximum BM that can occur at a section of 6 m from the left end. Any wheel load can lead the other. **09**



**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics-I**

Max. Marks: 70

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Marks: 14

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics-I**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section -I, Question No. 2 is compulsory, solve any two from the remaining.  
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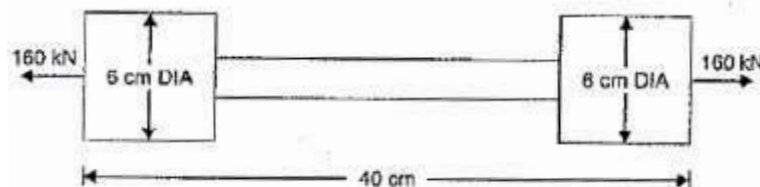


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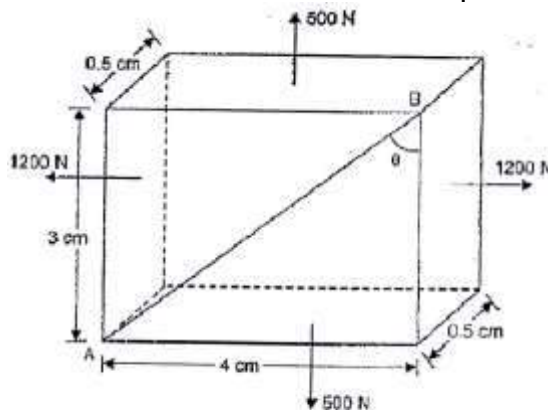


Fig.-2

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### Section – II

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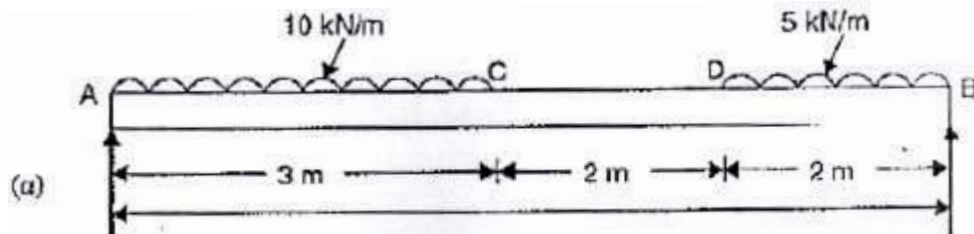


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- Q.7** A Timber beam of rectangular section of length 8 m is simply supported. The beam carries a UDL of  $12 \text{ kN/m}$  run over the entire length and a point load of 10 kN at 3 m from the left support. If the depth is two times the width and the stress in the timber is not to exceed  $8 \text{ N/mm}^2$ , find the suitable dimensions of the section. **09**
- Q.8** The shear force acting on a section of a beam is 50 kN. The section of the beam is of T-shaped of dimensions 100 mm x 100 mm x 20 mm as shown in fig.-4, the moment of inertia about the horizontal neutral axis is  $314.221 \times 10^4 \text{ mm}^4$ . Calculate the shear stress at the neutral axis and at the junction of the web and the flange. **09**

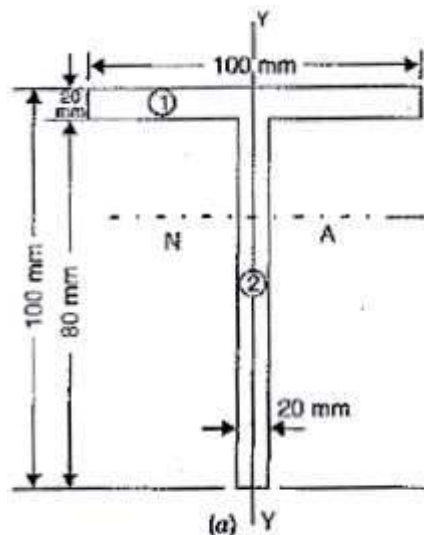


Fig.-4

- Q.9** Two-wheel loads 8 kN and 20 kN spaced at 2 m apart move along the span of girder of span 16 m. find the maximum BM that can occur at a section of 6 m from the left end. Any wheel load can lead the other. **09**

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics-I**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) When a beam is subjected to a bending moment the bending stress in a layer is \_\_\_\_\_ the distance from the neutral axis.
 

|                              |                             |
|------------------------------|-----------------------------|
| a) Independent of            | b) Directly proportional to |
| c) Inversely proportional to | d) None of these            |
- 2) The section modulus of a rectangular section having width "b" and depth "d" about an axis through its C. G. and parallel to the base "b" is \_\_\_\_\_.
 

|                |                  |
|----------------|------------------|
| a) $bd^2 / 12$ | b) $bd^2 / 4$    |
| c) $bd^2 / 6$  | d) None of these |
- 3) In influence line diagrams (ILD):- \_\_\_\_\_.
 

|                                                  |
|--------------------------------------------------|
| a) Points change, position of loads remain fixed |
| b) Both points and position of load changes      |
| c) Neither points nor position of load changes   |
| d) Points remain fixed, position of load changes |
- 4) What will be the shape of ILD curve for vertical reaction at left support for a simply supported beam?
 

|                |                |
|----------------|----------------|
| a) Triangular  | b) Rectangular |
| c) Trapezoidal | d) Cubic curve |
- 5) The elongation produced in a rod by its own weight of length "L" and diameter "D" rigidly fixed at the upper end and hanging is equal to \_\_\_\_\_.  
 Where  
 W = weight per unit volume of the rod  
 E = Modulus of elasticity
 

|                |                |
|----------------|----------------|
| a) $WL / 2E$   | b) $WL^2 / 2E$ |
| c) $WL^3 / 2E$ | d) $WL^4 / 2E$ |
- 6) The modulus of elasticity E and bulk modulus K are related by \_\_\_\_\_.
 

|                      |                      |
|----------------------|----------------------|
| a) $K = mE / 3(m-2)$ | b) $K = mE / 2(m+1)$ |
| c) $K = 3(m-2) / mE$ | d) $K = 2(m+1) / mE$ |



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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics-I**

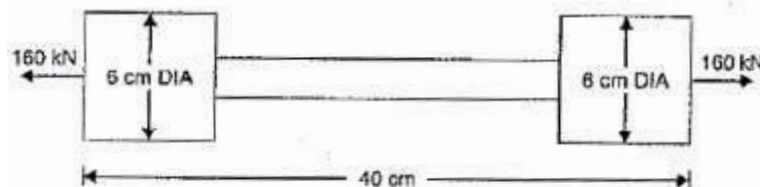
Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section -I, Question No. 2 is compulsory, solve any two from the remaining.  
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 3) Assume suitable data, if necessary and mention it clearly.  
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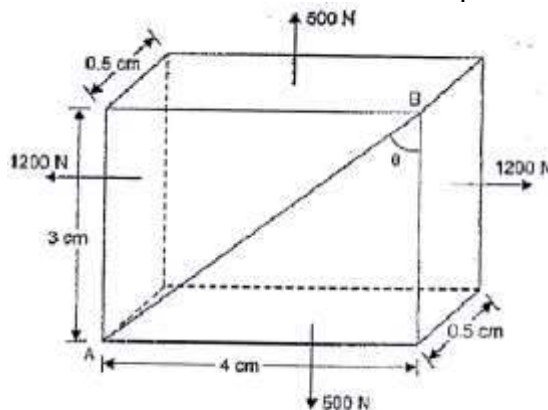
**Section – I**

- Q.2** The bar shown in fig-1, is subjected to a tensile load of 160 kN. If the stress in the middle portion is limited to  $150 \text{ N/mm}^2$ . Determine the diameter of the middle portion, find also the length of the middle portion, if the total elongation of the bar is to be 0.2 mm. young's modulus is given as  $2.1 \times 10^5 \text{ N/mm}^2$ . **10**



**Fig.-1**

- Q.3** A small block is 4 cm long, 3 cm high and 0.5 cm thick. It is subjected to uniformly distributed tensile forces of resultants 1200 N and 500 N as shown in fig.-2 compute the normal and shear stresses developed along the diagonal AB. **09**



**Fig.-2**



- Q.4** A circular shaft transmits 60 kW at 2 Hz it is supported in bearings 3 m apart and at 1 m from one bearing, it carries a pulley exerting a transverse load of 36 kN on the shaft. Determine a suitable diameter for the shaft if. **09**
- a) The maximum direct stress is not to exceed  $100 \text{ N/mm}^2$ .
- b) The maximum shear stress is not to exceed  $50 \text{ N/mm}^2$ .
- Q.5** Determine the diameter of bolt which is subjected to an axial pull of 9 kN together with a transverse shear force of 4.5 kN using maximum principal stress theory. Given the elastic limit in tension =  $225 \text{ N/mm}^2$ , Factor of safety = 3, and Poisson's ratio = 0.3. **09**

### Section – II

- Q.6** Draw the shear force and bending moment diagrams of a simply supported beam of length 7 m carrying uniformly distributed load as shown in fig.-3. **10**

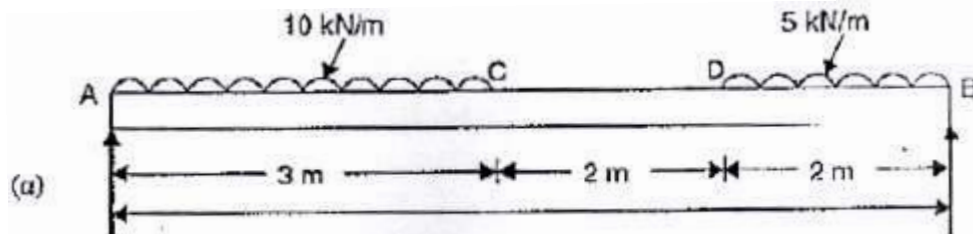


Fig.-3

- Q.7** A Timber beam of rectangular section of length 8 m is simply supported. The beam carries a UDL of  $12 \text{ kN/m}$  run over the entire length and a point load of 10 kN at 3 m from the left support. If the depth is two times the width and the stress in the timber is not to exceed  $8 \text{ N/mm}^2$ , find the suitable dimensions of the section. **09**
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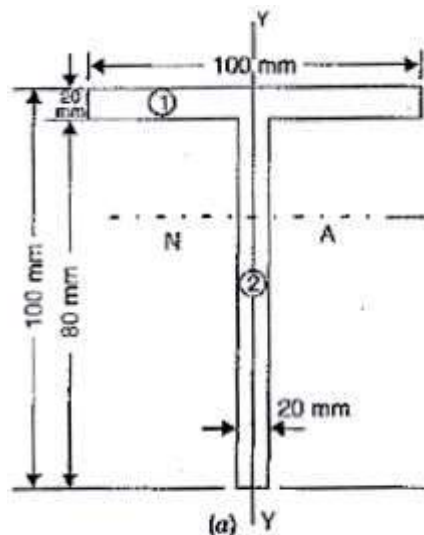


Fig.-4

- Q.9** Two-wheel loads 8 kN and 20 kN spaced at 2 m apart move along the span of girder of span 16 m. find the maximum BM that can occur at a section of 6 m from the left end. Any wheel load can lead the other. **09**

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics-I**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Pick the incorrect statement from the following four statements \_\_\_\_\_.
  - a) On the plane which carries maximum normal stress, the shear stress is zero
  - b) Principal planes are mutually orthogonal
  - c) On the plane which carries maximum shear stress, the normal stress is zero
  - d) The principal stress axes and principal strain axes coincide for an isotropic
- 2) Equivalent torque in a shaft subjected to axial load  $P$ , torque  $T$  and bending moment  $M$  is \_\_\_\_\_.
 

|                                  |                                        |
|----------------------------------|----------------------------------------|
| a) $T_{eq} = (Pa^2 + M^2 + T^2)$ | b) $T_{eq} = (Pa^2 + M^2 + T^2)^{0.5}$ |
| c) $T_{eq} = (M^2 + T^2)^{0.5}$  | d) $T_{eq} = (M^2 + T^2)$              |
- 3) Maximum principal stress is equal to \_\_\_\_\_.
  - a)  $(\sigma_x + \sigma_y)/2 + [(\sigma_x - \sigma_y)^2 + \tau^2]^{0.5}$
  - b)  $(\sigma_x + \sigma_y)/2 + 0.5 [(\sigma_x - \sigma_y)^2 + \tau^2]^{0.5}$
  - c)  $(\sigma_x + \sigma_y)/2 + 0.5 [(\sigma_x - \sigma_y)^2 + 4\tau^2]^{0.5}$
  - d)  $(\sigma_x + \sigma_y)/2 + 0.5 [(\sigma_x - \sigma_y)^2 + 4\tau^2]$
- 4) A concentrated load  $P$  acts on a simply supported beam of span " $L$ " at a distance  $(L/3)$  from the left support. The bending moment at the point of application of the load is given by \_\_\_\_\_.
 

|           |            |
|-----------|------------|
| a) $PL/3$ | b) $2PL/3$ |
| c) $PL/9$ | d) $2PL/9$ |
- 5) Shear force diagram of a cantilever beam with point load at free end is represented by \_\_\_\_\_.
 

|                |                    |
|----------------|--------------------|
| a) Triangular  | b) Semi-circular   |
| c) Rectangular | d) Parabolic curve |



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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics-I**

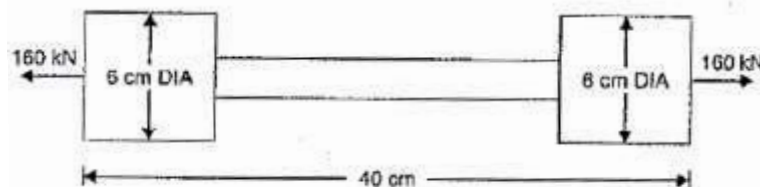
Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section -I, Question No. 2 is compulsory, solve any two from the remaining.  
 2) In Section - II, Question No. 6 is compulsory, solve any two from the remaining.  
 3) Assume suitable data, if necessary and mention it clearly.  
 4) Figures to the right indicate full marks.

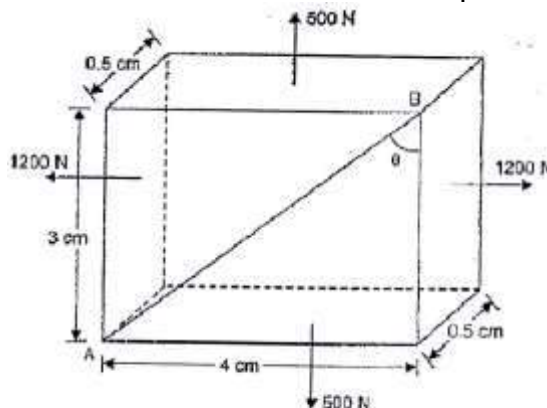
**Section – I**

- Q.2** The bar shown in fig-1, is subjected to a tensile load of 160 kN. If the stress in the middle portion is limited to  $150 \text{ N/mm}^2$ . Determine the diameter of the middle portion, find also the length of the middle portion, if the total elongation of the bar is to be 0.2 mm. young's modulus is given as  $2.1 \times 10^5 \text{ N/mm}^2$ . **10**



**Fig.-1**

- Q.3** A small block is 4 cm long, 3 cm high and 0.5 cm thick. It is subjected to uniformly distributed tensile forces of resultants 1200 N and 500 N as shown in fig.-2 compute the normal and shear stresses developed along the diagonal AB. **09**



**Fig.-2**

- Q.4** A circular shaft transmits 60 kW at 2 Hz it is supported in bearings 3 m apart and at 1 m from one bearing, it carries a pulley exerting a transverse load of 36 kN on the shaft. Determine a suitable diameter for the shaft if. **09**
- a) The maximum direct stress is not to exceed  $100 \text{ N/mm}^2$ .
- b) The maximum shear stress is not to exceed  $50 \text{ N/mm}^2$ .
- Q.5** Determine the diameter of bolt which is subjected to an axial pull of 9 kN together with a transverse shear force of 4.5 kN using maximum principal stress theory. Given the elastic limit in tension =  $225 \text{ N/mm}^2$ , Factor of safety = 3, and Poisson's ratio = 0.3. **09**

### Section – II

- Q.6** Draw the shear force and bending moment diagrams of a simply supported beam of length 7 m carrying uniformly distributed load as shown in fig.-3. **10**

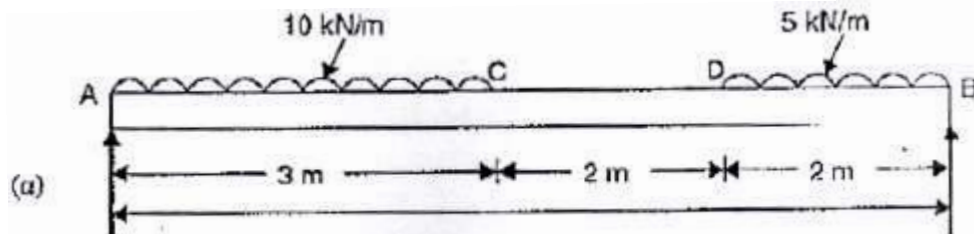


Fig.-3

- Q.7** A Timber beam of rectangular section of length 8 m is simply supported. The beam carries a UDL of  $12 \text{ kN/m}$  run over the entire length and a point load of 10 kN at 3 m from the left support. If the depth is two times the width and the stress in the timber is not to exceed  $8 \text{ N/mm}^2$ , find the suitable dimensions of the section. **09**
- Q.8** The shear force acting on a section of a beam is 50 kN. The section of the beam is of T-shaped of dimensions  $100 \text{ mm} \times 100 \text{ mm} \times 20 \text{ mm}$  as shown in fig.-4, the moment of inertia about the horizontal neutral axis is  $314.221 \times 10^4 \text{ mm}^4$ . Calculate the shear stress at the neutral axis and at the junction of the web and the flange. **09**

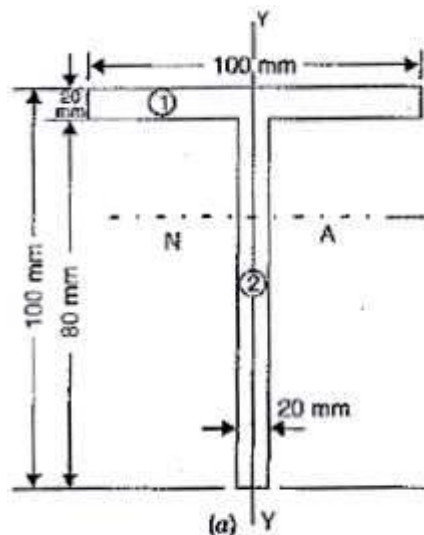


Fig.-4

- Q.9** Two-wheel loads 8 kN and 20 kN spaced at 2 m apart move along the span of girder of span 16 m. find the maximum BM that can occur at a section of 6 m from the left end. Any wheel load can lead the other. **09**

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Set **P**

**S.Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering – I**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Freeman's formula for estimating fire demand  $Q = 5663\sqrt{P}$  where "P" indicates \_\_\_\_\_.  
 a) Population in hundreds                      b) Population in thousands  
 c) Population in lakhs                            d) None of the above
- 2) Most causes of alkalinity in river water is \_\_\_\_\_.  
 a) Carbonates                                      b) Bicarbonates  
 c) Hydroxides                                      d) All of the above
- 3) \_\_\_\_\_ as disinfectant doesn't leave behind any residual.  
 a) UV light                                          b) Bleaching powder  
 c) Chlorine gas                                      d) Chlorine powder
- 4) Cleaning of Rapid sand Filter is done by \_\_\_\_\_.  
 a) Backwashing                                    b) Scrapping and removal of sand  
 c) Both a) and b)                                  d) None of the above
- 5) Standard EDTA is used in the titration to determine \_\_\_\_\_ of the water.  
 a) Alkalinity                                          b) Acidity  
 c) Hardness                                          d) Chlorides
- 6) Stokes law is applied in the design of \_\_\_\_\_ treatment unit.  
 a) Coagulation                                      b) Filtration  
 c) Sedimentation                                  d) Aeration
- 7) Overflow rate in the sedimentation tank is independent of \_\_\_\_\_ of the tank.  
 a) Height                                              b) Length  
 c) Detention time                                  d) Breadth
- 8) To absorb the hourly variation in demand \_\_\_\_\_ type of reservoirs are provided.  
 a) Sedimentation                                  b) Distribution  
 c) Penetration                                      d) Filtration



- 9) The purpose of aeration used in water treatment is to \_\_\_\_\_.  
a) reduce corrosion to water pipes  
b) remove iron and manganese  
c) remove hydrogen sulphide  
d) All of the above
- 10) In rapid sand filters the permissible head loss is \_\_\_\_\_.  
a) Between 2.5 and 3.5 m  
b) Exactly 2.5 m  
c) Less than 5 m  
d) All of the above
- 11) \_\_\_\_\_ is constituent of Asbestos cement pipe.  
a) Sand  
b) Lime  
c) Portland cement  
d) Iron
- 12) Corrosion is \_\_\_\_\_ process.  
a) Electrodynamic  
b) Electrochemical  
c) Electrostatic  
d) Electromagnetic
- 13) \_\_\_\_\_ treatment reduces salinity of water.  
a) Flocculation  
b) Reverse osmosis  
c) Electro-dialysis  
d) Both b) and c)
- 14) Analysis of pipe networks of distribution system is calculated by \_\_\_\_\_.  
a) Discharge in pipelines  
b) Equivalent pipe method  
c) Computation of pressure  
d) Mass Curve Method

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**S.Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering-I**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section-I, Q. No. 2 is compulsory and solve any two questions from the remaining.  
 2) In Section-II, Q. No. 6 is compulsory and solve any two questions from the remaining.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever necessary and mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Find the population and of a city in 2051 by Incremental Increase method. **06**

| Year | Population |
|------|------------|
| 1991 | 15,000     |
| 2001 | 41,000     |
| 2011 | 65,000     |
| 2021 | 98,000     |
| 2031 | 1,12,000   |

- b)** Describe various factors affecting the demand of water. **04**

- Q.3 a)** A settling tank is designed for an overflow rate of 3500 lit./m<sup>2</sup>/hr. What percentage of particles of diameter (i) 0.04 mm and (ii) 0.02 mm will be removed in this tank at water temperature of 10°C. Take  $S_s = 2.65$ . **05**

- b)** Explain the methodology adopted in usage of Alum and copperas in coagulation process with the help of chemical equations. **04**

- Q.4 a)** Design a Flocculator for the flow of 15 MLD. **05**

- b)** Write short note on Lime soda ash method of water softening. **04**

- Q.5 a)** Design cascade type circular aerator with the following data **05**

- 1) Quantity of water flowing over aerator per day = 120 MLD.
- 2) Loading rate = 0.03 m<sup>2</sup>/m<sup>3</sup>/hr.
- 3) Velocity of water flow in collecting channel = 1 m/s

- b)** Explain any four types of sedimentation tanks in WTP. **04**

**Section – II**

- Q.6 a)** A large service reservoir supplies water to two colonies. **06**

Colony A - Population 12000

Colony B - Population 60000

Determine the diameter of supply pipe and hydraulic gradient. Average daily demand is 200 lpcd

- b)** Discuss Gravity System with diagram. **04**

- |            |                             |                                                                     |           |
|------------|-----------------------------|---------------------------------------------------------------------|-----------|
| <b>Q.7</b> | <b>a)</b>                   | Explain methodology of chlorination process with the help of graph. | <b>05</b> |
|            | <b>b)</b>                   | Explain Reverse Osmosis with a neat diagram.                        | <b>04</b> |
| <b>Q.8</b> | <b>a)</b>                   | Discuss the various types of storage reservoirs.                    | <b>05</b> |
|            | <b>b)</b>                   | Discuss the different types of losses in pipes.                     | <b>04</b> |
| <b>Q.9</b> | <b>Write short notes on</b> |                                                                     |           |
|            | <b>a)</b>                   | UV                                                                  | <b>09</b> |
|            | <b>b)</b>                   | Adsorption                                                          |           |
|            | <b>c)</b>                   | Ozone Disinfection                                                  |           |

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Set **Q**

**S.Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering – I**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) To absorb the hourly variation in demand \_\_\_\_\_ type of reservoirs are provided.
  - a) Sedimentation
  - b) Distribution
  - c) Penetration
  - d) Filtration
- 2) The purpose of aeration used in water treatment is to \_\_\_\_\_.
  - a) reduce corrosion to water pipes
  - b) remove iron and manganese
  - c) remove hydrogen sulphide
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- 3) In rapid sand filters the permissible head loss is \_\_\_\_\_.
  - a) Between 2.5 and 3.5 m
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- 4) \_\_\_\_\_ is constituent of Asbestos cement pipe.
  - a) Sand
  - b) Lime
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  - b) Equivalent pipe method
  - c) Computation of pressure
  - d) Mass Curve Method
- 8) Freeman's formula for estimating fire demand  $Q = 5663\sqrt{P}$  where "P" indicates \_\_\_\_\_.
  - a) Population in hundreds
  - b) Population in thousands
  - c) Population in lakhs
  - d) None of the above

- Page 6 of 16

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**S.Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering-I**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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- b)** Explain the methodology adopted in usage of Alum and copperas in coagulation process with the help of chemical equations. **04**

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- |            |                             |                                                                     |           |
|------------|-----------------------------|---------------------------------------------------------------------|-----------|
| <b>Q.7</b> | <b>a)</b>                   | Explain methodology of chlorination process with the help of graph. | <b>05</b> |
|            | <b>b)</b>                   | Explain Reverse Osmosis with a neat diagram.                        | <b>04</b> |
| <b>Q.8</b> | <b>a)</b>                   | Discuss the various types of storage reservoirs.                    | <b>05</b> |
|            | <b>b)</b>                   | Discuss the different types of losses in pipes.                     | <b>04</b> |
| <b>Q.9</b> | <b>Write short notes on</b> |                                                                     |           |
|            | <b>a)</b>                   | UV                                                                  | <b>09</b> |
|            | <b>b)</b>                   | Adsorption                                                          |           |
|            | <b>c)</b>                   | Ozone Disinfection                                                  |           |

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Set **R**

**S.Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering – I**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) \_\_\_\_\_ is constituent of Asbestos cement pipe.
  - a) Sand
  - b) Lime
  - c) Portland cement
  - d) Iron
- 2) Corrosion is \_\_\_\_\_ process.
  - a) Electrodynamic
  - b) Electrochemical
  - c) Electrostatic
  - d) Electromagnetic
- 3) \_\_\_\_\_ treatment reduces salinity of water.
  - a) Flocculation
  - b) Reverse osmosis
  - c) Electro-dialysis
  - d) Both b) and c)
- 4) Analysis of pipe networks of distribution system is calculated by \_\_\_\_\_.
  - a) Discharge in pipelines
  - b) Equivalent pipe method
  - c) Computation of pressure
  - d) Mass Curve Method
- 5) Freeman's formula for estimating fire demand  $Q = 5663\sqrt{P}$  where "P" indicates \_\_\_\_\_.
  - a) Population in hundreds
  - b) Population in thousands
  - c) Population in lakhs
  - d) None of the above
- 6) Most causes of alkalinity in river water is \_\_\_\_\_.
  - a) Carbonates
  - b) Bicarbonates
  - c) Hydroxides
  - d) All of the above
- 7) \_\_\_\_\_ as disinfectant doesn't leave behind any residual.
  - a) UV light
  - b) Bleaching powder
  - c) Chlorine gas
  - d) Chlorine powder
- 8) Cleaning of Rapid sand Filter is done by \_\_\_\_\_.
  - a) Backwashing
  - b) Scrapping and removal of sand
  - c) Both a) and b)
  - d) None of the above
- 9) Standard EDTA is used in the titration to determine \_\_\_\_\_ of the water.
  - a) Alkalinity
  - b) Acidity
  - c) Hardness
  - d) Chlorides



- 10) Stokes law is applied in the design of \_\_\_\_\_ treatment unit.
- |                  |               |
|------------------|---------------|
| a) Coagulation   | b) Filtration |
| c) Sedimentation | d) Aeration   |
- 11) Overflow rate in the sedimentation tank is independent of \_\_\_\_\_ of the tank.
- |                   |            |
|-------------------|------------|
| a) Height         | b) Length  |
| c) Detention time | d) Breadth |
- 12) To absorb the hourly variation in demand \_\_\_\_\_ type of reservoirs are provided.
- |                  |                 |
|------------------|-----------------|
| a) Sedimentation | b) Distribution |
| c) Penetration   | d) Filtration   |
- 13) The purpose of aeration used in water treatment is to \_\_\_\_\_.
- |                                    |                              |
|------------------------------------|------------------------------|
| a) reduce corrosion to water pipes | b) remove iron and manganese |
| c) remove hydrogen sulphide        | d) All of the above          |
- 14) In rapid sand filters the permissible head loss is \_\_\_\_\_.
- |                          |                     |
|--------------------------|---------------------|
| a) Between 2.5 and 3.5 m | b) Exactly 2.5 m    |
| c) Less than 5 m         | d) All of the above |

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| Set | R |
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**S.Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering-I**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section-I, Q. No. 2 is compulsory and solve any two questions from the remaining.  
 2) In Section-II, Q. No. 6 is compulsory and solve any two questions from the remaining.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever necessary and mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Find the population and of a city in 2051 by Incremental Increase method. **06**

| Year | Population |
|------|------------|
| 1991 | 15,000     |
| 2001 | 41,000     |
| 2011 | 65,000     |
| 2021 | 98,000     |
| 2031 | 1,12,000   |

- b)** Describe various factors affecting the demand of water. **04**

- Q.3 a)** A settling tank is designed for an overflow rate of 3500 lit./m<sup>2</sup>/hr. What percentage of particles of diameter (i) 0.04 mm and (ii) 0.02 mm will be removed in this tank at water temperature of 10°C. Take  $S_s = 2.65$ . **05**

- b)** Explain the methodology adopted in usage of Alum and copperas in coagulation process with the help of chemical equations. **04**

- Q.4 a)** Design a Flocculator for the flow of 15 MLD. **05**

- b)** Write short note on Lime soda ash method of water softening. **04**

- Q.5 a)** Design cascade type circular aerator with the following data **05**

- 1) Quantity of water flowing over aerator per day = 120 MLD.
- 2) Loading rate = 0.03 m<sup>2</sup>/m<sup>3</sup>/hr.
- 3) Velocity of water flow in collecting channel = 1 m/s

- b)** Explain any four types of sedimentation tanks in WTP. **04**

**Section – II**

- Q.6 a)** A large service reservoir supplies water to two colonies. **06**

Colony A - Population 12000

Colony B - Population 60000

Determine the diameter of supply pipe and hydraulic gradient. Average daily demand is 200 lpcd

- b)** Discuss Gravity System with diagram. **04**

- |            |                             |                                                                     |           |
|------------|-----------------------------|---------------------------------------------------------------------|-----------|
| <b>Q.7</b> | <b>a)</b>                   | Explain methodology of chlorination process with the help of graph. | <b>05</b> |
|            | <b>b)</b>                   | Explain Reverse Osmosis with a neat diagram.                        | <b>04</b> |
|            |                             |                                                                     |           |
| <b>Q.8</b> | <b>a)</b>                   | Discuss the various types of storage reservoirs.                    | <b>05</b> |
|            | <b>b)</b>                   | Discuss the different types of losses in pipes.                     | <b>04</b> |
|            |                             |                                                                     |           |
| <b>Q.9</b> | <b>Write short notes on</b> |                                                                     |           |
|            | <b>a)</b>                   | UV                                                                  | <b>09</b> |
|            | <b>b)</b>                   | Adsorption                                                          |           |
|            | <b>c)</b>                   | Ozone Disinfection                                                  |           |

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Set **S**

**S.Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering – I**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Assume data wherever necessary

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Stokes law is applied in the design of \_\_\_\_\_ treatment unit.
  - a) Coagulation
  - b) Filtration
  - c) Sedimentation
  - d) Aeration
- 2) Overflow rate in the sedimentation tank is independent of \_\_\_\_\_ of the tank.
  - a) Height
  - b) Length
  - c) Detention time
  - d) Breadth
- 3) To absorb the hourly variation in demand \_\_\_\_\_ type of reservoirs are provided.
  - a) Sedimentation
  - b) Distribution
  - c) Penetration
  - d) Filtration
- 4) The purpose of aeration used in water treatment is to \_\_\_\_\_.
  - a) reduce corrosion to water pipes
  - b) remove iron and manganese
  - c) remove hydrogen sulphide
  - d) All of the above
- 5) In rapid sand filters the permissible head loss is \_\_\_\_\_.
  - a) Between 2.5 and 3.5 m
  - b) Exactly 2.5 m
  - c) Less than 5 m
  - d) All of the above
- 6) \_\_\_\_\_ is constituent of Asbestos cement pipe.
  - a) Sand
  - b) Lime
  - c) Portland cement
  - d) Iron
- 7) Corrosion is \_\_\_\_\_ process.
  - a) Electrodynamic
  - b) Electrochemical
  - c) Electrostatic
  - d) Electromagnetic
- 8) \_\_\_\_\_ treatment reduces salinity of water.
  - a) Flocculation
  - b) Reverse osmosis
  - c) Electro-dialysis
  - d) Both b) and c)

- 9) Analysis of pipe networks of distribution system is calculated by \_\_\_\_\_.  
a) Discharge in pipelines                      b) Equivalent pipe method  
c) Computation of pressure                    d) Mass Curve Method
- 10) Freeman's formula for estimating fire demand  $Q = 5663\sqrt{P}$  where "P" indicates \_\_\_\_\_.  
a) Population in hundreds                      b) Population in thousands  
c) Population in lakhs                            d) None of the above
- 11) Most causes of alkalinity in river water is \_\_\_\_\_.  
a) Carbonates                                      b) Bicarbonates  
c) Hydroxides                                      d) All of the above
- 12) \_\_\_\_\_ as disinfectant doesn't leave behind any residual.  
a) UV light                                          b) Bleaching powder  
c) Chlorine gas                                      d) Chlorine powder
- 13) Cleaning of Rapid sand Filter is done by \_\_\_\_\_.  
a) Backwashing                                      b) Scrapping and removal of sand  
c) Both a) and b)                                    d) None of the above
- 14) Standard EDTA is used in the titration to determine \_\_\_\_\_ of the water.  
a) Alkalinity                                          b) Acidity  
c) Hardness                                          d) Chlorides

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**S.Y. (B. Tech) (Sem – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Environmental Engineering-I**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) In Section-I, Q. No. 2 is compulsory and solve any two questions from the remaining.  
 2) In Section-II, Q. No. 6 is compulsory and solve any two questions from the remaining.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever necessary and mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Find the population and of a city in 2051 by Incremental Increase method. **06**

| Year | Population |
|------|------------|
| 1991 | 15,000     |
| 2001 | 41,000     |
| 2011 | 65,000     |
| 2021 | 98,000     |
| 2031 | 1,12,000   |

- b)** Describe various factors affecting the demand of water. **04**

- Q.3 a)** A settling tank is designed for an overflow rate of 3500 lit./m<sup>2</sup>/hr. What percentage of particles of diameter (i) 0.04 mm and (ii) 0.02 mm will be removed in this tank at water temperature of 10°C. Take  $S_s = 2.65$ . **05**

- b)** Explain the methodology adopted in usage of Alum and copperas in coagulation process with the help of chemical equations. **04**

- Q.4 a)** Design a Flocculator for the flow of 15 MLD. **05**

- b)** Write short note on Lime soda ash method of water softening. **04**

- Q.5 a)** Design cascade type circular aerator with the following data **05**

- 1) Quantity of water flowing over aerator per day = 120 MLD.
- 2) Loading rate = 0.03 m<sup>2</sup>/m<sup>3</sup>/hr.
- 3) Velocity of water flow in collecting channel = 1 m/s

- b)** Explain any four types of sedimentation tanks in WTP. **04**

**Section – II**

- Q.6 a)** A large service reservoir supplies water to two colonies. **06**

Colony A - Population 12000

Colony B - Population 60000

Determine the diameter of supply pipe and hydraulic gradient. Average daily demand is 200 lpcd

- b)** Discuss Gravity System with diagram. **04**

- |            |                             |                                                                     |           |
|------------|-----------------------------|---------------------------------------------------------------------|-----------|
| <b>Q.7</b> | <b>a)</b>                   | Explain methodology of chlorination process with the help of graph. | <b>05</b> |
|            | <b>b)</b>                   | Explain Reverse Osmosis with a neat diagram.                        | <b>04</b> |
|            |                             |                                                                     |           |
| <b>Q.8</b> | <b>a)</b>                   | Discuss the various types of storage reservoirs.                    | <b>05</b> |
|            | <b>b)</b>                   | Discuss the different types of losses in pipes.                     | <b>04</b> |
|            |                             |                                                                     |           |
| <b>Q.9</b> | <b>Write short notes on</b> |                                                                     |           |
|            | <b>a)</b>                   | UV                                                                  | <b>09</b> |
|            | <b>b)</b>                   | Adsorption                                                          |           |
|            | <b>c)</b>                   | Ozone Disinfection                                                  |           |

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Set

P

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Building Planning & Design**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 04:00 PM

Max. Marks: 35

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 07

**Q.1 Choose the correct alternatives from the options.**

**07**

- 1) Which is not a type of building?
  - a) Educational Building
  - b) Mercantile Building
  - c) Institutional Building
  - d) Domestic Building
- 2) Combining two or more plots as a single plot is called \_\_\_\_\_.
  - a) Amalgamation
  - b) Frontage
  - c) Bifurcation
  - d) Building setback
- 3) Partially ventilated single stack system is the modified form of \_\_\_\_\_.
  - a) Single stack system and two-pipe system
  - b) Single stack system and one pipe system
  - c) One pipe system and two-pipe system
  - d) Two pipe system
- 4) The earthing wire should have \_\_\_\_\_.
  - a) High resistance
  - b) Medium resistance
  - c) Negligible resistance
  - d) Any of the above
- 5) The Low income housing construction funding is provided by \_\_\_\_\_.
  - a) National Governments
  - b) State Governments
  - c) World Bank
  - d) National Governments, State Governments and World Bank
- 6) \_\_\_\_\_ is generated in the air when a surface is vibrated.
  - a) Sound
  - b) Thunder
  - c) Both A and B
  - d) None of these
- 7) The green building process can be applied to which of these?
  - a) Buildings
  - b) Materials
  - c) Interiors
  - d) All of above



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Building Planning & Design**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 04:00 PM

Max. Marks: 28

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any Two.** **08**
- a) Write down about “Site Selection Criteria for Education building”.
  - b) Enlist and explain the in brief “Principles of Building Planning” with neat sketch.
  - c) What is Orientations? Explain with sketch about “Orientations of building for various part of India on bases of climate conditions”.
  - d) Explain with sketch about “Wind Flow Diagram”.
- Q.3 Attempt any One:** **06**
- a) Explain with flow chart “Procedure and list of documents for Building Permission”.
  - b) Enlist and explain the in brief about “Types of Residential Building” with neat sketch.

**Section – II**

- Q.4 Attempt any two.** **08**
- a) Explain in brief about “Single Stuck Way Piper system” with neat sketch.
  - b) Draw a neat sketch “Various type of Traps”
  - c) What is “Green Building”? Explain in brief.
  - d) What is “Low Costing Housing”? Explain in brief
- Q.5 Attempt any One:** **06**
- a) Enlist and explain in short materials available for “Sound Insulation”.
  - b) Explain in short about “Fire Resistant Structures”

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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 04:00 PM

Max. Marks: 35

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

Duration: 20 Minutes

Marks: 07

**Q.1 Choose the correct alternatives from the options.**

07

- 1) The earthing wire should have \_\_\_\_\_.  
a) High resistance                      b) Medium resistance  
c) Negligible resistance                d) Any of the above
- 2) The Low income housing construction funding is provided by \_\_\_\_\_.  
a) National Governments  
b) State Governments  
c) World Bank  
d) National Governments, State Governments and World Bank
- 3) \_\_\_\_\_ is generated in the air when a surface is vibrated.  
a) Sound                                  b) Thunder  
c) Both A and B                         d) None of these
- 4) The green building process can be applied to which of these?  
a) Buildings                              b) Materials  
c) Interiors                                d) All of above
- 5) Which is not a type of building?  
a) Educational Building                b) Mercantile Building  
c) Institutional Building                d) Domestic Building
- 6) Combining two or more plots as a single plot is called \_\_\_\_\_.  
a) Amalgamation                        b) Frontage  
c) Bifurcation                            d) Building setback
- 7) Partially ventilated single stack system is the modified form of \_\_\_\_\_.  
a) Single stack system and two-pipe system  
b) Single stack system and one pipe system  
c) One pipe system and two-pipe system  
d) Two pipe system

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Building Planning & Design**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 04:00 PM

Max. Marks: 28

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any Two.** **08**
- a) Write down about "Site Selection Criteria for Education building".
  - b) Enlist and explain the in brief "Principles of Building Planning" with neat sketch.
  - c) What is Orientations? Explain with sketch about "Orientations of building for various part of India on bases of climate conditions".
  - d) Explain with sketch about "Wind Flow Diagram".
- Q.3 Attempt any One:** **06**
- a) Explain with flow chart "Procedure and list of documents for Building Permission".
  - b) Enlist and explain the in brief about "Types of Residential Building" with neat sketch.

**Section – II**

- Q.4 Attempt any two.** **08**
- a) Explain in brief about "Single Stuck Way Piper system" with neat sketch.
  - b) Draw a neat sketch "Various type of Traps"
  - c) What is "Green Building"? Explain in brief.
  - d) What is "Low Costing Housing"? Explain in brief
- Q.5 Attempt any One:** **06**
- a) Enlist and explain in short materials available for "Sound Insulation".
  - b) Explain in short about "Fire Resistant Structures"

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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 04:00 PM

Max. Marks: 35

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

Duration: 20 Minutes

Marks: 07

**Q.1 Choose the correct alternatives from the options.**

07

- 1) \_\_\_\_\_ is generated in the air when a surface is vibrated.  
a) Sound  
b) Thunder  
c) Both A and B  
d) None of these
- 2) The green building process can be applied to which of these?  
a) Buildings  
b) Materials  
c) Interiors  
d) All of above
- 3) Which is not a type of building?  
a) Educational Building  
b) Mercantile Building  
c) Institutional Building  
d) Domestic Building
- 4) Combining two or more plots as a single plot is called \_\_\_\_\_.  
a) Amalgamation  
b) Frontage  
c) Bifurcation  
d) Building setback
- 5) Partially ventilated single stack system is the modified form of \_\_\_\_\_.  
a) Single stack system and two-pipe system  
b) Single stack system and one pipe system  
c) One pipe system and two-pipe system  
d) Two pipe system
- 6) The earthing wire should have \_\_\_\_\_.  
a) High resistance  
b) Medium resistance  
c) Negligible resistance  
d) Any of the above
- 7) The Low income housing construction funding is provided by \_\_\_\_\_.  
a) National Governments  
b) State Governments  
c) World Bank  
d) National Governments, State Governments and World Bank

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Building Planning & Design**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 04:00 PM

Max. Marks: 28

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any Two.** **08**
- a) Write down about “Site Selection Criteria for Education building”.
  - b) Enlist and explain the in brief “Principles of Building Planning” with neat sketch.
  - c) What is Orientations? Explain with sketch about “Orientations of building for various part of India on bases of climate conditions”.
  - d) Explain with sketch about “Wind Flow Diagram”.
- Q.3 Attempt any One:** **06**
- a) Explain with flow chart “Procedure and list of documents for Building Permission”.
  - b) Enlist and explain the in brief about “Types of Residential Building” with neat sketch.

**Section – II**

- Q.4 Attempt any two.** **08**
- a) Explain in brief about “Single Stuck Way Piper system” with neat sketch.
  - b) Draw a neat sketch “Various type of Traps”
  - c) What is “Green Building”? Explain in brief.
  - d) What is “Low Costing Housing”? Explain in brief
- Q.5 Attempt any One:** **06**
- a) Enlist and explain in short materials available for “Sound Insulation”.
  - b) Explain in short about “Fire Resistant Structures”

# S

## Max. Marks: 35

Marks: 07

## 07

- Page 7 of 8

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Building Planning & Design**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 04:00 PM

Max. Marks: 28

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any Two.** **08**
- a) Write down about "Site Selection Criteria for Education building".
  - b) Enlist and explain the in brief "Principles of Building Planning" with neat sketch.
  - c) What is Orientations? Explain with sketch about "Orientations of building for various part of India on bases of climate conditions".
  - d) Explain with sketch about "Wind Flow Diagram".
- Q.3 Attempt any One:** **06**
- a) Explain with flow chart "Procedure and list of documents for Building Permission".
  - b) Enlist and explain the in brief about "Types of Residential Building" with neat sketch.

**Section – II**

- Q.4 Attempt any two.** **08**
- a) Explain in brief about "Single Stuck Way Piper system" with neat sketch.
  - b) Draw a neat sketch "Various type of Traps"
  - c) What is "Green Building"? Explain in brief.
  - d) What is "Low Costing Housing"? Explain in brief
- Q.5 Attempt any One:** **06**
- a) Enlist and explain in short materials available for "Sound Insulation".
  - b) Explain in short about "Fire Resistant Structures"

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Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 1 of 20



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**S.Y (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any 3 questions from each section, Q1 and Q5 are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of scientific non programmable calculator is allowed.  
 4) Draw the appropriate sketches wherever necessary.  
 5) Assume suitable data if necessary and mention it clearly before the solution

**Section – I**

- Q.2** A masonry pier of 3 m x 4 m supports a vertical load of 80 kN as shown in fig.1 **10**  
**a)** Find the stresses developed at each corner of the pier  
**b)** What additional load should be placed at the center of the pier, so that there is no tension anywhere in the pier section.  
**c)** What are the stresses at the corners with the additional load in the center?

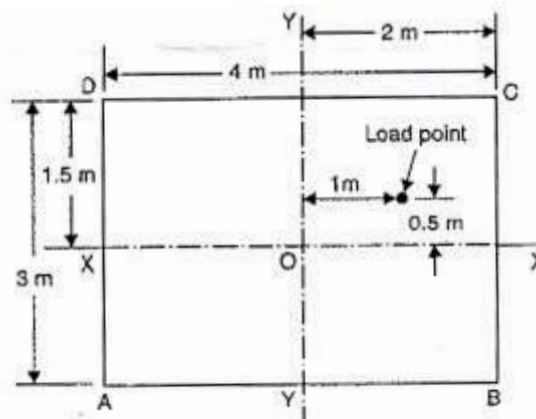


Fig.-1

- Q.3 a)** State Mohr's theorem to determine slope and deflection. **02**  
**b)** A hollow alloy tube 5 m long with external and internal diameter 40 mm and 25 mm respectively was found to extend 6.4 mm under a tensile load of 60 kN. Find the buckling load for the tube when used as a column with both ends pinned. Also find the safe load for the tube taking a factor of safety = 3 **07**

- Q.4** A three hinged parabolic arch of span 40 m and rise 10 m carries a uniformly distributed load of 30 kN/m over left half span as shown in fig.-2. Find horizontal thrust and support reaction.

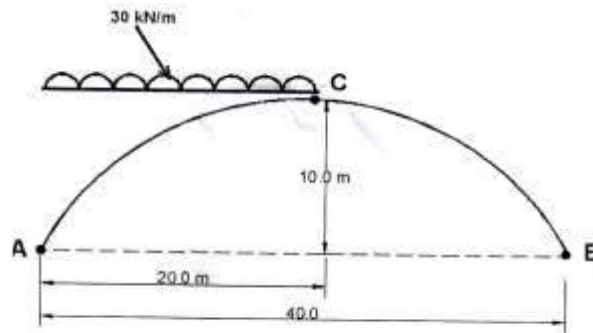


Fig.-2

- Q.5** A masonry trapezoidal dam 4 m high, 1 m wide at its top and 3 m width at its bottom retains water on its vertical face. Determine the maximum and minimum stresses at the base.

- 1) when the reservoir is full
- 2) when the reservoir is empty

Take the weight of masonry as  $19.62 \text{ kN/m}^3$ . Weight of water as  $9810 \text{ N/m}^3$ .

### Section – II

- Q.6** Analyze the continuous beam as shown in Fig.-3 and draw bending moment diagram.

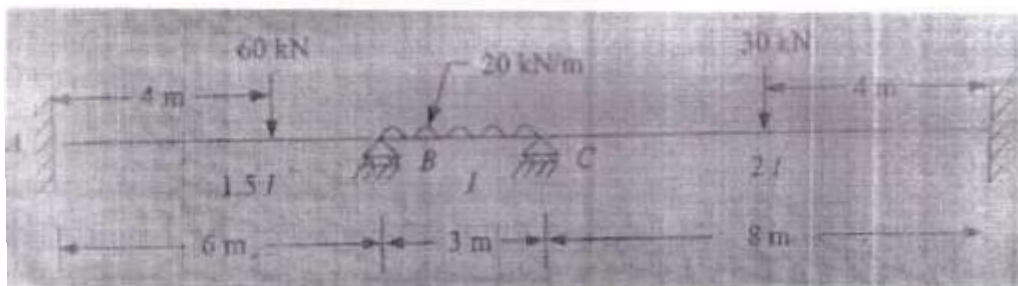


Fig.-3

- Q.7 a)** Determine the degree of static and kinematic indeterminacy of the frame as shown in Fig-4.

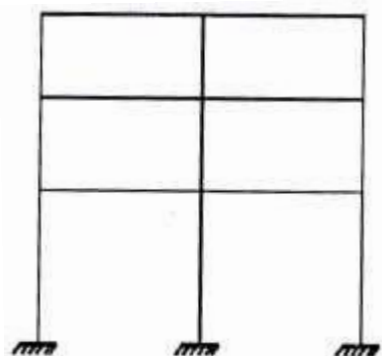


Fig.-4

- b) Analyze the continuous beam as shown in fig.-5 by flexibility matrix method. 07

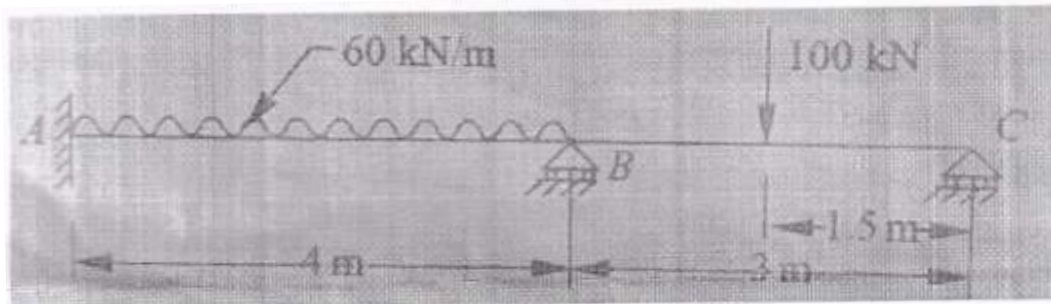


Fig.-5

- Q.8 Analysis the frame shown in Fig- 6 by stiffness matrix method. 09

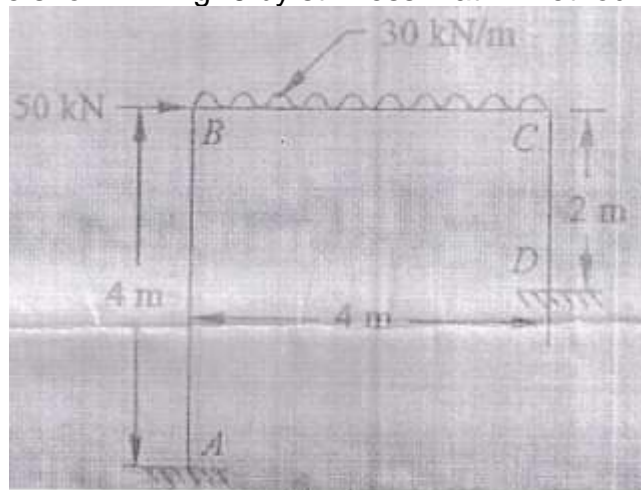
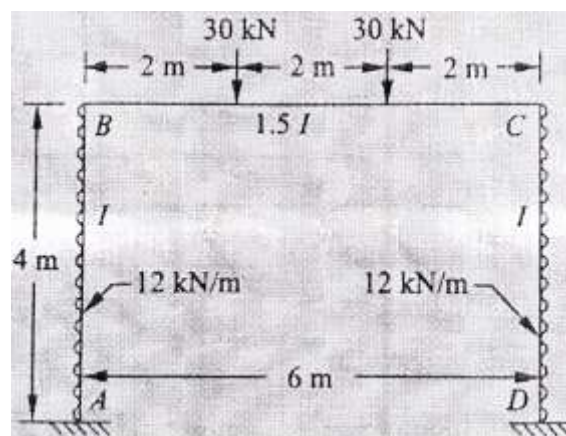


Fig.-6

- Q.9 Analysis the symmetric portal frame as shown in fig.-7 by moment distribution method. 09



**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- 1) A three-hinged parabolic arch subjected to a load  $w$  at  $L/4$  distance from left support. The rise of the Crown is 4 m, span is 20 m and  $w$  is 80 kN, the horizontal thrust at the support is \_\_\_\_\_.  
a) 40 kN                                      b) 25 kN  
c) 80 kN                                      d) 50 kN
- 2) A parabolic three hinged arch ABC is supporting uniformly distributed load of 500 N/m over its entire span of 100 m, the center point "B" is vertically 25 m high from supports A and C.  
The reactions shall be \_\_\_\_\_.  
a) 50 kN horizontal and vertical reactions at each support  
b) 25 kN horizontal and 50 kN vertical reactions at each support  
c) 50 kN horizontal and 25 kN vertical reactions at each support  
d) 25 kN horizontal and vertical reactions at each support
- 3) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always \_\_\_\_\_.  
a) Zero                                          b) Less than 1  
c) One                                          d) Greater than 1
- 4) Carryover Moment at end B due to moment  $M$  applied at end A for the given beam is \_\_\_\_\_.



- Page 6 of 20



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Set **Q**

**S.Y (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any 3 questions from each section, Q1 and Q5 are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of scientific non programmable calculator is allowed.  
 4) Draw the appropriate sketches wherever necessary.  
 5) Assume suitable data if necessary and mention it clearly before the solution

**Section – I**

- Q.2** A masonry pier of 3 m x 4 m supports a vertical load of 80 kN as shown in fig.1 **10**
- Find the stresses developed at each corner of the pier
  - What additional load should be placed at the center of the pier, so that there is no tension anywhere in the pier section.
  - What are the stresses at the corners with the additional load in the center?

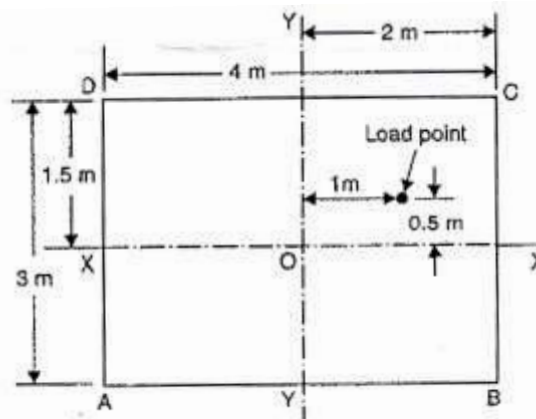


Fig.-1

- Q.3** a) State Mohr's theorem to determine slope and deflection. **02**
- b) A hollow alloy tube 5 m long with external and internal diameter 40 mm and 25 mm respectively was found to extend 6.4 mm under a tensile load of 60 kN. Find the buckling load for the tube when used as a column with both ends pinned. Also find the safe load for the tube taking a factor of safety = 3 **07**

- Q.4** A three hinged parabolic arch of span 40 m and rise 10 m carries a uniformly distributed load of 30 kN/m over left half span as shown in fig.-2. Find horizontal thrust and support reaction.

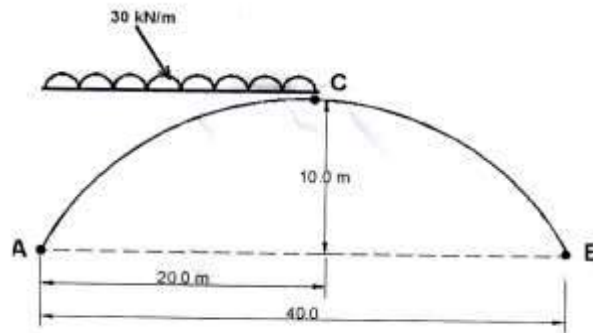


Fig.-2

- Q.5** A masonry trapezoidal dam 4 m high, 1 m wide at its top and 3 m width at its bottom retains water on its vertical face. Determine the maximum and minimum stresses at the base.

- 1) when the reservoir is full
- 2) when the reservoir is empty

Take the weight of masonry as  $19.62 \text{ kN/m}^3$ . Weight of water as  $9810 \text{ N/m}^3$ .

### Section – II

- Q.6** Analyze the continuous beam as shown in Fig.-3 and draw bending moment diagram.

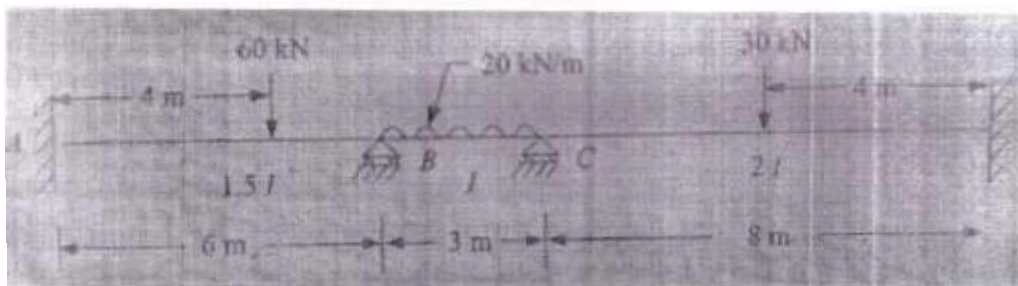


Fig.-3

- Q.7 a)** Determine the degree of static and kinematic indeterminacy of the frame as shown in Fig-4.

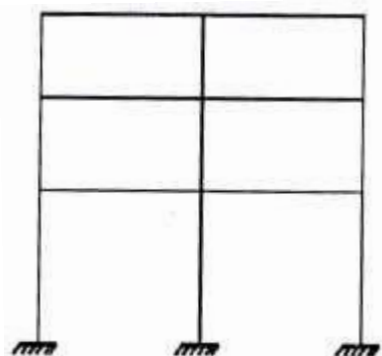


Fig.-4



- b) Analyze the continuous beam as shown in fig.-5 by flexibility matrix method. 07

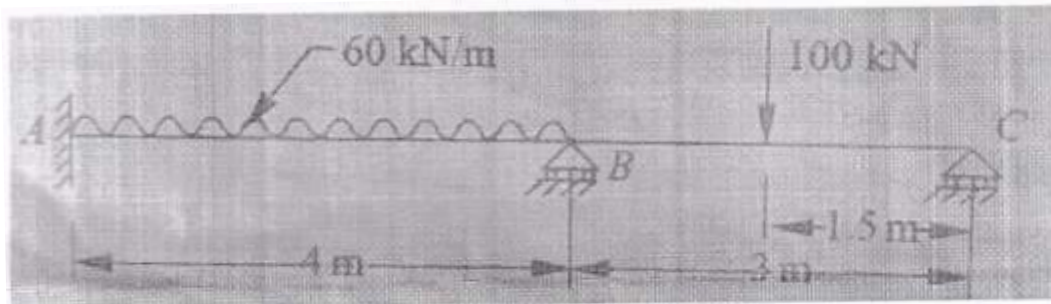


Fig.-5

- Q.8 Analysis the frame shown in Fig- 6 by stiffness matrix method. 09

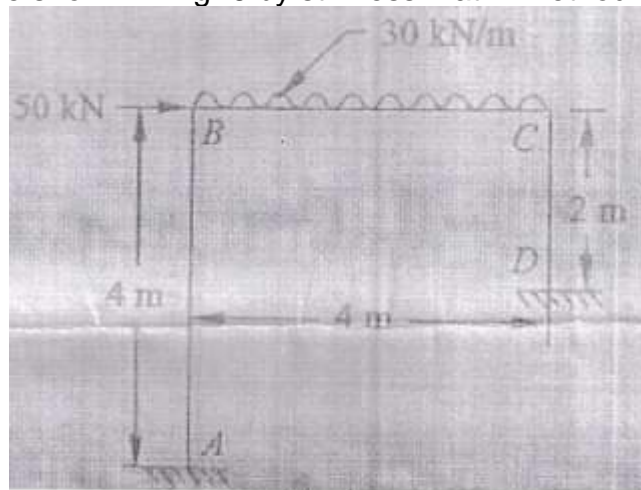
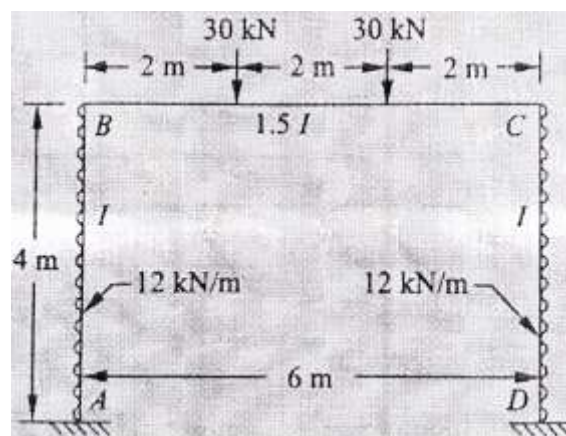


Fig.-6

- Q.9 Analysis the symmetric portal frame as shown in fig.-7 by moment distribution method. 09



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## Max. Marks: 70

Marks: 14

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- Page 11 of 20

- Page 12 of 20

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**S.Y (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any 3 questions from each section, Q1 and Q5 are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of scientific non programmable calculator is allowed.  
 4) Draw the appropriate sketches wherever necessary.  
 5) Assume suitable data if necessary and mention it clearly before the solution

**Section – I**

- Q.2** A masonry pier of 3 m x 4 m supports a vertical load of 80 kN as shown in fig.1 **10**  
 a) Find the stresses developed at each corner of the pier  
 b) What additional load should be placed at the center of the pier, so that there is no tension anywhere in the pier section.  
 c) What are the stresses at the corners with the additional load in the center?

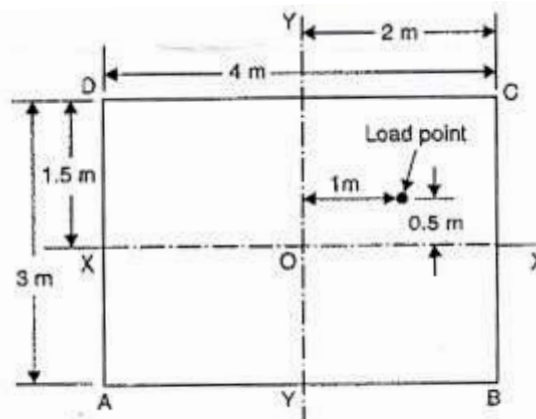


Fig.-1

- Q.3** a) State Mohr's theorem to determine slope and deflection. **02**  
 b) A hollow alloy tube 5 m long with external and internal diameter 40 mm and 25 mm respectively was found to extend 6.4 mm under a tensile load of 60 kN. Find the buckling load for the tube when used as a column with both ends pinned. Also find the safe load for the tube taking a factor of safety = 3 **07**

- Q.4** A three hinged parabolic arch of span 40 m and rise 10 m carries a uniformly distributed load of 30 kN/m over left half span as shown in fig.-2. Find horizontal thrust and support reaction.

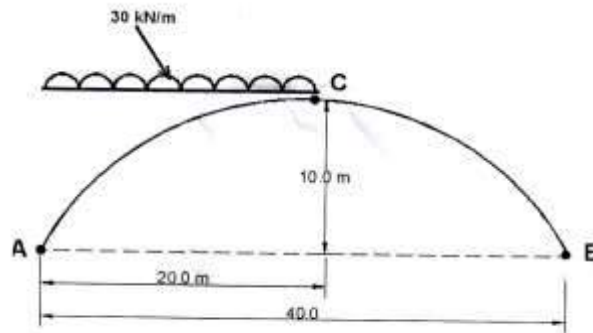


Fig.-2

- Q.5** A masonry trapezoidal dam 4 m high, 1 m wide at its top and 3 m width at its bottom retains water on its vertical face. Determine the maximum and minimum stresses at the base.

- 1) when the reservoir is full
- 2) when the reservoir is empty

Take the weight of masonry as  $19.62 \text{ kN/m}^3$ . Weight of water as  $9810 \text{ N/m}^3$ .

### Section – II

- Q.6** Analyze the continuous beam as shown in Fig.-3 and draw bending moment diagram.

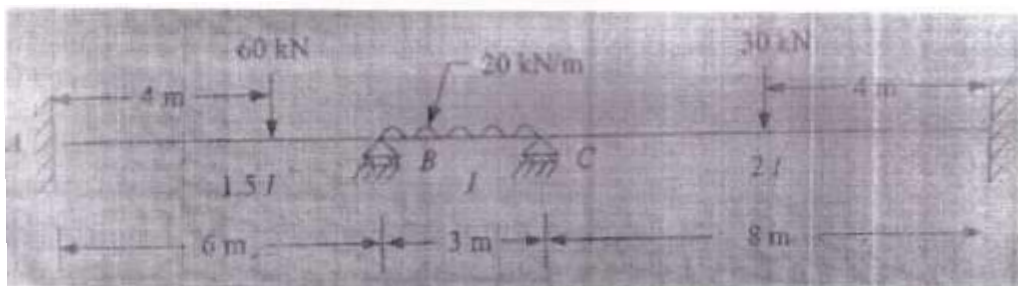


Fig.-3

- Q.7 a)** Determine the degree of static and kinematic indeterminacy of the frame as shown in Fig-4.

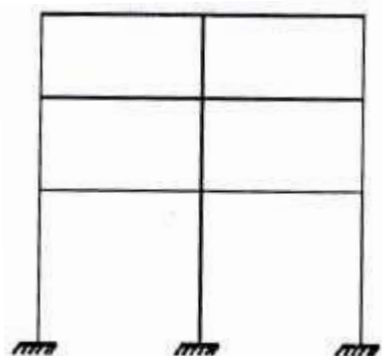


Fig.-4

- b) Analyze the continuous beam as shown in fig.-5 by flexibility matrix method. 07

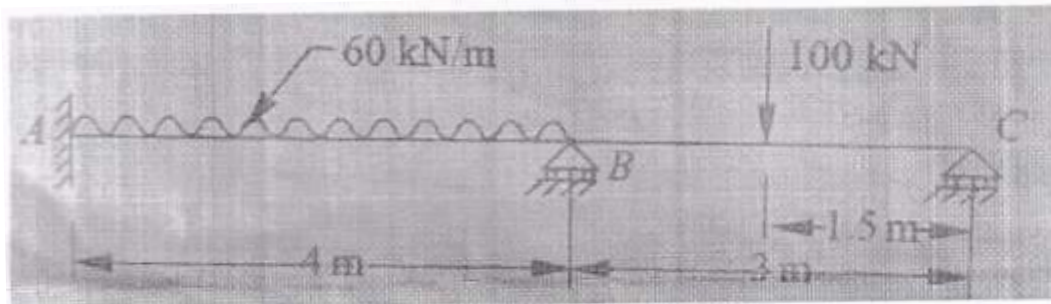


Fig.-5

- Q.8 Analysis the frame shown in Fig- 6 by stiffness matrix method. 09

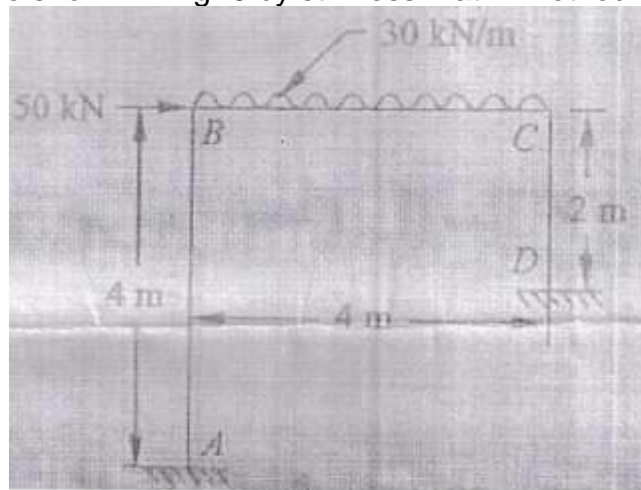
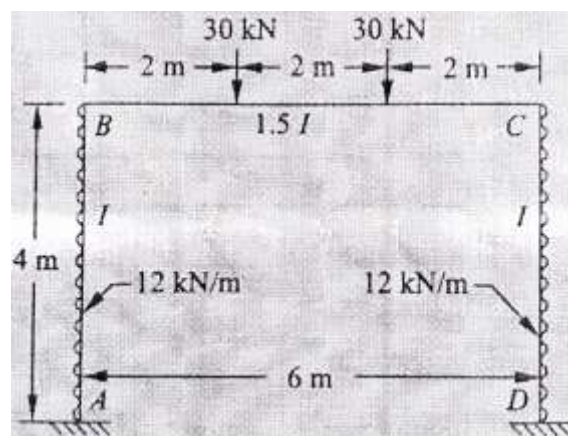


Fig.-6

- Q.9 Analysis the symmetric portal frame as shown in fig.-7 by moment distribution method. 09



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**S.Y (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Bending moment at any section in a conjugate beam gives \_\_\_\_\_ in the actual beam.
 

|               |                   |
|---------------|-------------------|
| a) Slope      | b) Curvature      |
| c) Deflection | d) Bending moment |
- 2) In cantilever beam, slope and deflection at free end is \_\_\_\_\_.
 

|            |                      |
|------------|----------------------|
| a) Zero    | b) Maximum           |
| c) Minimum | d) None of the above |
- 3) A three-hinged parabolic arch subjected to a load  $w$  at  $L/4$  distance from left support. The rise of the Crown is 4 m, span is 20 m and  $w$  is 80 kN, the horizontal thrust at the support is \_\_\_\_\_.
 

|          |          |
|----------|----------|
| a) 40 kN | b) 25 kN |
| c) 80 kN | d) 50 kN |
- 4) A parabolic three hinged arch ABC is supporting uniformly distributed load of 500 N/m over its entire span of 100 m, the center point "B" is vertically 25 m high from supports A and C.  
 The reactions shall be \_\_\_\_\_.
 

|                                                                  |
|------------------------------------------------------------------|
| a) 50 kN horizontal and vertical reactions at each support       |
| b) 25 kN horizontal and 50 kN vertical reactions at each support |
| c) 50 kN horizontal and 25 kN vertical reactions at each support |
| d) 25 kN horizontal and vertical reactions at each support       |
- 5) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always \_\_\_\_\_.
 

|         |                   |
|---------|-------------------|
| a) Zero | b) Less than 1    |
| c) One  | d) Greater than 1 |





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**S.Y (B. Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Mechanics – II**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any 3 questions from each section, Q1 and Q5 are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of scientific non programmable calculator is allowed.  
 4) Draw the appropriate sketches wherever necessary.  
 5) Assume suitable data if necessary and mention it clearly before the solution

**Section – I**

- Q.2** A masonry pier of 3 m x 4 m supports a vertical load of 80 kN as shown in fig.1 **10**
- Find the stresses developed at each corner of the pier
  - What additional load should be placed at the center of the pier, so that there is no tension anywhere in the pier section.
  - What are the stresses at the corners with the additional load in the center?

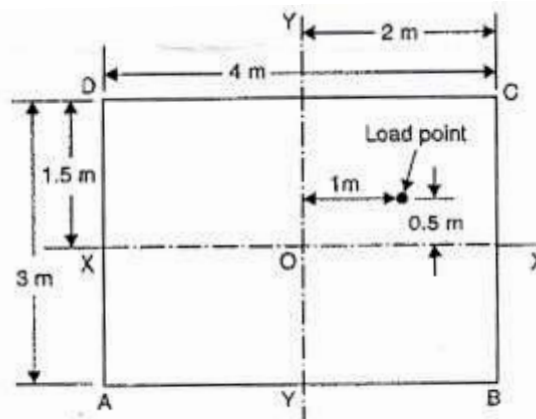


Fig.-1

- Q.3** **a)** State Mohr's theorem to determine slope and deflection. **02**
- b)** A hollow alloy tube 5 m long with external and internal diameter 40 mm and 25 mm respectively was found to extend 6.4 mm under a tensile load of 60 kN. Find the buckling load for the tube when used as a column with both ends pinned. Also find the safe load for the tube taking a factor of safety = 3 **07**

- Q.4** A three hinged parabolic arch of span 40 m and rise 10 m carries a uniformly distributed load of 30 kN/m over left half span as shown in fig.-2. Find horizontal thrust and support reaction.

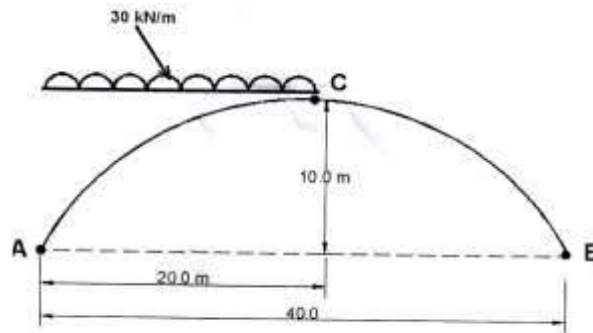


Fig.-2

- Q.5** A masonry trapezoidal dam 4 m high, 1 m wide at its top and 3 m width at its bottom retains water on its vertical face. Determine the maximum and minimum stresses at the base.

- 1) when the reservoir is full
- 2) when the reservoir is empty

Take the weight of masonry as  $19.62 \text{ kN/m}^3$ . Weight of water as  $9810 \text{ N/m}^3$ .

### Section – II

- Q.6** Analyze the continuous beam as shown in Fig.-3 and draw bending moment diagram.

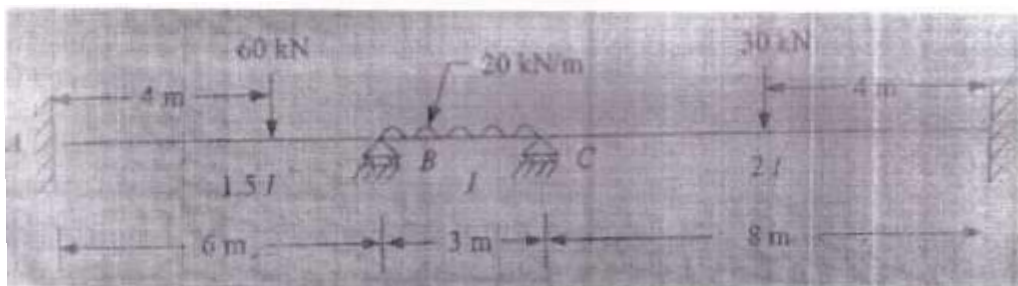


Fig.-3

- Q.7 a)** Determine the degree of static and kinematic indeterminacy of the frame as shown in Fig-4.

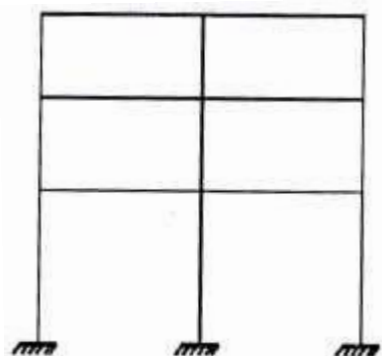


Fig.-4

- b) Analyze the continuous beam as shown in fig.-5 by flexibility matrix method. 07

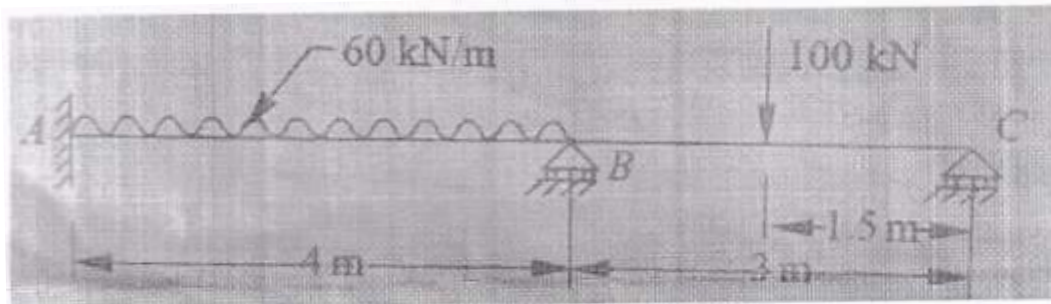


Fig.-5

- Q.8 Analysis the frame shown in Fig- 6 by stiffness matrix method. 09

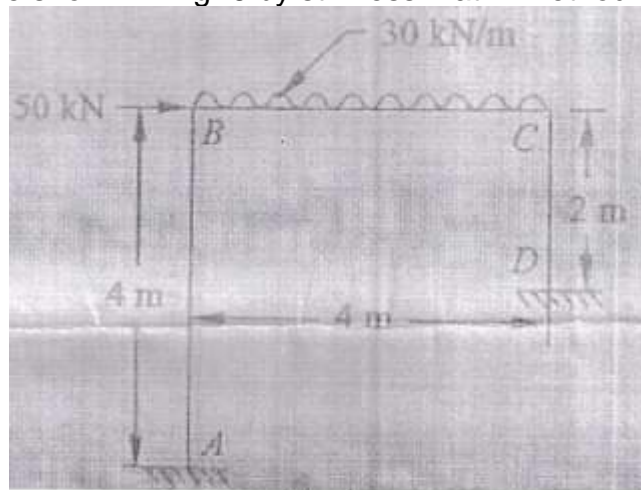
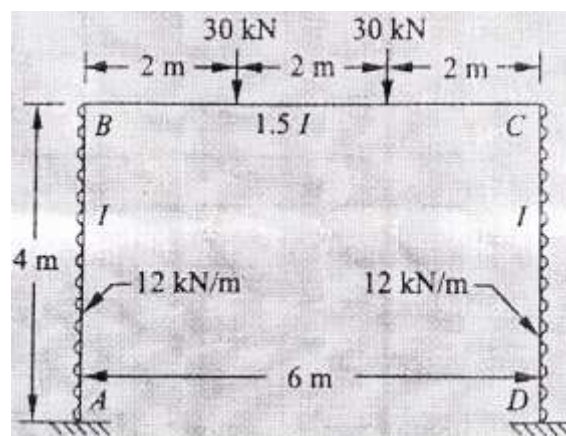


Fig.-6

- Q.9 Analysis the symmetric portal frame as shown in fig.-7 by moment distribution method. 09



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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Geology**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Draw neat and labelled diagrams wherever necessary.

**Section – I**

- Q.2**     **a)** Define unconformity. Explain Non-conformity. **06**  
             **b)** What are igneous rocks? Give their classification on the basis of silica percentage. **06**

**OR**

- Q.3**     **a)** Define Sedimentary rocks. Describe Cross bedding structure. **06**  
             **b)** Describe physical properties and chemical properties of Quartz group minerals. **06**

- Q.4**     Define Volcano. Describe Solid products of Volcano. **07**

**OR**

- Q.5**     Define Fold. Describe Anticline and Syncline folds. **07**

- Q.6**     **Write notes on (Any Three)** **09**  
             **a)** Gneissose structure  
             **b)** Normal Fault  
             **c)** Columnar Joints  
             **d)** Types of fractures in minerals  
             **e)** Crust of the Earth

**Section – II**

- Q.7**     **a)** Define Aquifer. Describe confined aquifer/ Artesian well. **06**  
             **b)** Define Landslides. Explain any two types of Landslides. **06**

**OR**

- Q.8**     **a)** Define Earthquake. Describe Seismic waves. **06**  
             **b)** Describe any three types of Dams. **06**

- Q.9**     Define Dam. Describe desirable geological conditions in faulted region for Dams. **07**

**OR**

- Q.10**    What are Building Stones? Add a note on Porosity and Permeability of building stones. **07**

- Q.11 Write notes on (Any Three)**
- a)** Electric resistivity method
  - b)** Reservoir on Folds
  - c)** Core drill and core loss
  - d)** Silting process
  - e)** Durability of rocks

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## Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

## 14

- Page 5 of 16



- 10) Which one of the following is a part of volcano?
  - a) Crater
  - b) Geyser
  - c) Volcanic cinder
  - d) Limb
- 11) A coarse-grained sedimentary rock with rounded pebbles, cobbles is called as \_\_\_\_\_.
  - a) breccias
  - b) sandstone
  - c) conglomerate
  - d) basalt
- 12) In \_\_\_\_\_ fold, axial plane is vertical.
  - a) asymmetrical
  - b) symmetrical
  - c) overturned
  - d) recumbent
- 13) Hardness of Diamond is \_\_\_\_\_.
  - a) 1
  - b) 10
  - c) 8
  - d) 9
- 14) Formation of sediments by breaking of the rocks by natural agents with change in their composition is a \_\_\_\_\_ weathering.
  - a) chemical
  - b) mechanical
  - c) biological
  - d) physical

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Geology**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Draw neat and labelled diagrams wherever necessary.

**Section – I**

- Q.2**     **a)** Define unconformity. Explain Non-conformity. **06**  
             **b)** What are igneous rocks? Give their classification on the basis of silica percentage. **06**

**OR**

- Q.3**     **a)** Define Sedimentary rocks. Describe Cross bedding structure. **06**  
             **b)** Describe physical properties and chemical properties of Quartz group minerals. **06**

- Q.4**     Define Volcano. Describe Solid products of Volcano. **07**

**OR**

- Q.5**     Define Fold. Describe Anticline and Syncline folds. **07**

- Q.6**     **Write notes on (Any Three)** **09**  
             **a)** Gneissose structure  
             **b)** Normal Fault  
             **c)** Columnar Joints  
             **d)** Types of fractures in minerals  
             **e)** Crust of the Earth

**Section – II**

- Q.7**     **a)** Define Aquifer. Describe confined aquifer/ Artesian well. **06**  
             **b)** Define Landslides. Explain any two types of Landslides. **06**

**OR**

- Q.8**     **a)** Define Earthquake. Describe Seismic waves. **06**  
             **b)** Describe any three types of Dams. **06**

- Q.9**     Define Dam. Describe desirable geological conditions in faulted region for Dams. **07**

**OR**

- Q.10**    What are Building Stones? Add a note on Porosity and Permeability of building stones. **07**

- Q.11 Write notes on (Any Three)**
- a)** Electric resistivity method
  - b)** Reservoir on Folds
  - c)** Core drill and core loss
  - d)** Silting process
  - e)** Durability of rocks

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Geology**

Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) An instrument which records earthquake waves is \_\_\_\_\_.  
a) Seismoscope                      b) Seismogram  
c) Seismograph                    d) Seismometer
- 2) Which of the following is important engineering property of building stones?  
a) compressive strength              b) tensile strength  
c) durability                          d) All the above
- 3) Which of the following is most common and fast indirect method of sub-surface investigations?  
a) seismic method                      b) gravity method  
c) drilling method                       d) electric resistivity method
- 4) Which of the following dam can be constructed on weak, unconsolidated foundation?  
a) Earthen dam                          b) Arch dam  
c) Gravity dam                          d) none of these
- 5) Metamorphic rock with thin separable layers and clay, mica minerals is called as a \_\_\_\_\_.  
a) marble                                  b) gneiss  
c) slate                                     d) shale
- 6) The radius of the earth is \_\_\_\_\_ km.  
a) 20                                        b) 40  
c) 2900                                      d) 6763
- 7) Which one of the following is a part of volcano?  
a) Crater                                    b) Geyser  
c) Volcanic cinder                       d) Limb
- 8) A coarse-grained sedimentary rock with rounded pebbles, cobbles is called as \_\_\_\_\_.  
a) breccias                                b) sandstone  
c) conglomerate                         d) basalt



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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Geology**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Draw neat and labelled diagrams wherever necessary.

**Section – I**

- Q.2**     **a)** Define unconformity. Explain Non-conformity. **06**  
           **b)** What are igneous rocks? Give their classification on the basis of silica percentage. **06**

**OR**

- Q.3**     **a)** Define Sedimentary rocks. Describe Cross bedding structure. **06**  
           **b)** Describe physical properties and chemical properties of Quartz group minerals. **06**

- Q.4**     Define Volcano. Describe Solid products of Volcano. **07**

**OR**

- Q.5**     Define Fold. Describe Anticline and Syncline folds. **07**

- Q.6**     **Write notes on (Any Three)** **09**  
           **a)** Gneissose structure  
           **b)** Normal Fault  
           **c)** Columnar Joints  
           **d)** Types of fractures in minerals  
           **e)** Crust of the Earth

**Section – II**

- Q.7**     **a)** Define Aquifer. Describe confined aquifer/ Artesian well. **06**  
           **b)** Define Landslides. Explain any two types of Landslides. **06**

**OR**

- Q.8**     **a)** Define Earthquake. Describe Seismic waves. **06**  
           **b)** Describe any three types of Dams. **06**

- Q.9**     Define Dam. Describe desirable geological conditions in faulted region for Dams. **07**

**OR**

- Q.10**    What are Building Stones? Add a note on Porosity and Permeability of building stones. **07**

- Q.11 Write notes on (Any Three)**
- a)** Electric resistivity method
  - b)** Reservoir on Folds
  - c)** Core drill and core loss
  - d)** Silting process
  - e)** Durability of rocks

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Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

14

- Page 13 of 16



- 9) Which of the following dam can be constructed on weak, unconsolidated foundation?
- |                |                  |
|----------------|------------------|
| a) Earthen dam | b) Arch dam      |
| c) Gravity dam | d) none of these |
- 10) Metamorphic rock with thin separable layers and clay, mica minerals is called as a \_\_\_\_\_.
- |           |           |
|-----------|-----------|
| a) marble | b) gneiss |
| c) slate  | d) shale  |
- 11) The radius of the earth is \_\_\_\_\_ km.
- |         |         |
|---------|---------|
| a) 20   | b) 40   |
| c) 2900 | d) 6763 |
- 12) Which one of the following is a part of volcano?
- |                    |           |
|--------------------|-----------|
| a) Crater          | b) Geyser |
| c) Volcanic cinder | d) Limb   |
- 13) A coarse-grained sedimentary rock with rounded pebbles, cobbles is called as \_\_\_\_\_.
- |                 |              |
|-----------------|--------------|
| a) breccias     | b) sandstone |
| c) conglomerate | d) basalt    |
- 14) In \_\_\_\_\_ fold, axial plane is vertical.
- |                 |                |
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| a) asymmetrical | b) symmetrical |
| c) overturned   | d) recumbent   |

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING  
Engineering Geology**

Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Draw neat and labelled diagrams wherever necessary.

**Section – I**

- Q.2**     **a)** Define unconformity. Explain Non-conformity. **06**  
             **b)** What are igneous rocks? Give their classification on the basis of silica percentage. **06**

**OR**

- Q.3**     **a)** Define Sedimentary rocks. Describe Cross bedding structure. **06**  
             **b)** Describe physical properties and chemical properties of Quartz group minerals. **06**

- Q.4**     Define Volcano. Describe Solid products of Volcano. **07**

**OR**

- Q.5**     Define Fold. Describe Anticline and Syncline folds. **07**

- Q.6**     **Write notes on (Any Three)** **09**  
             **a)** Gneissose structure  
             **b)** Normal Fault  
             **c)** Columnar Joints  
             **d)** Types of fractures in minerals  
             **e)** Crust of the Earth

**Section – II**

- Q.7**     **a)** Define Aquifer. Describe confined aquifer/ Artesian well. **06**  
             **b)** Define Landslides. Explain any two types of Landslides. **06**

**OR**

- Q.8**     **a)** Define Earthquake. Describe Seismic waves. **06**  
             **b)** Describe any three types of Dams. **06**

- Q.9**     Define Dam. Describe desirable geological conditions in faulted region for Dams. **07**

**OR**

- Q.10**    What are Building Stones? Add a note on Porosity and Permeability of building stones. **07**

- Q.11 Write notes on (Any Three)**
- a)** Electric resistivity method
  - b)** Reservoir on Folds
  - c)** Core drill and core loss
  - d)** Silting process
  - e)** Durability of rocks

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Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

Marks: 14

14

- Page 1 of 16

- 8) If  $L\{f(t) = F(s)\}$ , then  $L\{tf(t)\} = \underline{\hspace{2cm}}$ .
- a)  $\frac{d}{ds}\{F(s)\}$                       b)  $\frac{1}{s} F(s)$   
 c)  $-\frac{d}{ds}\{F(s)\}$                       d)  $\int_s^\infty F(s)ds$
- 9)  $L\left\{\int_0^t \cos h(t)dt\right\} = \underline{\hspace{2cm}}$
- a)  $\frac{s}{s^2 - 1}$                       b)  $\frac{s}{s^2 + 1}$   
 c)  $-\frac{2s}{(s^2 - 1)^2}$                       d)  $\frac{1}{s^2 - 1}$
- 10) In solving algebraic and transcendental equations, the rate convergence of Newton's Raphson method is  $\underline{\hspace{2cm}}$ .
- a) 0.5                      b) 2  
 c) 1.5                      d) 1.62
- 11) The number of strips required to use Weddle's rule is  $\underline{\hspace{2cm}}$ .
- a) Multiple of 6                      b) Multiple of 3  
 c) Multiple of 2                      d) Any number
- 12) The order of error is Simpson's  $\frac{1}{3}$ rd rule is  $\underline{\hspace{2cm}}$ .
- a)  $h^3$                       b)  $h^2$   
 c)  $h^4$                       d)  $h^6$
- 13) A continuous random variable has the probability density function  $f(x) = kx^2$ , for  $0 \leq x \leq 2$  then  $k = \underline{\hspace{2cm}}$ .
- a)  $\frac{8}{3}$                       b)  $\frac{3}{2}$   
 c)  $\frac{5}{8}$                       d)  $\frac{3}{8}$
- 14) The line of regression equations are given by  $10y = x + 17$  and  $x = 5y - 7$ , then mean  $\bar{x}$  and  $\bar{y}$  are respectively  $\underline{\hspace{2cm}}$ .
- a) 1 and 10                      b) 1 and 5  
 c) 3 and 2                      d) 2 and 3

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three from the following.** **09**

- Solve :  $(D^2 + 1)y = 3 + 5e^{-3x}$
- Solve :  $(D^3 - 4D)y = \cos(x)$
- Solve :  $p(1 + q) = qz$
- Solve :  $x^2p^2 + y^2q^2 = qz$
- Obtain the Fourier series of  $f(x) = 1 - x^2$  in  $-1 \leq x \leq 1$

**Q.3 Attempt any three from the followings.** **09**

- Solve :  $(D^2 + 4)y = x \cos x$
- Solve :  $py = 2xy + \log q$
- Solve :  $y^4z p + zx^4q = xy^4$
- Obtain the half range sine series of the function  $f(x) = \pi x - x^2$  in  $(0, \pi)$
- Solve :  $(D^2 + 6D + 9)y = e^{-3x} \cos 2(x)$

**Q.4 Attempt any two from the following.** **10**

- Solve the partial differential equation by method of separation of variables  
 $\frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = z$  where  $z(x, 0) = 6e^{-3x}$
- Obtain the Fourier series of the function series of the function  
 $f(x) = \frac{1}{4}(\pi - x)^2$   $0 \leq x \leq 2\pi$
- The equation of motion of a spring whose one and other end supports weight of 10 lbs is given by equation  $\frac{d^2x}{dt^2} + \frac{8}{25} \frac{dx}{dt} + 64x = 0$ .  
 If at  $t = 0$ ,  $x = 0.25$  and  $\frac{dx}{dt} = 0$ , then find the displacement ' $x$ ' at any time ' $t$ '

**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Find  $L\{e^{-3t}t \sin 4t\}$
- Find  $L^{-1}\left\{\frac{s}{(s-2)(s+3)}\right\}$
- Compute the coefficient of correlation between  $x$  and  $y$  from the data  
 $N = 20, \sum x = 80, \sum x^2 = 900, \sum y = 70, \sum y^2 = 800$  and  $\sum xy = 700$
- Evaluate  $\int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's 1/3<sup>rd</sup> rule with  $h = 0.25$

- e) Find a positive real root of the equation  $2x - 3 \sin x - 5 = 0$  correct to three decimal places by Regula Falsi method.

**Q.6 Attempt any three from the following.****09**

- a) The probability that a missile will strike the target is  $\frac{1}{5}$ . If six missiles are fixed, then using Binomial distribution find the probability that exactly two will strike the target.
- b) If the probability an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution determine the probability that out of 2000 individuals
- exactly 3,
  - at most 2 will suffer a bad reaction
- c) Find  $L^{-1}\left\{\frac{1}{s(s^2+9)}\right\}$  by convolution theorem.
- d) Find a positive real root of the equation  $xe^x - 2 = 0$  correct to three decimal places by Newton's Raphson method.
- e) Find the Laplace transform of  $t \sin 2t \cos 3t$

**Q.7 Attempt any two from the following.****10**

- a) Evaluate  $\int_0^{\infty} e^{-3t} t \sin t \, dt$  by Laplace transform
- b) Evaluate  $\int_0^{\pi} \frac{\sin x}{x} \, dx$  by dividing range into six equals parts, using Trapezoidal rule and Weddle's rule.
- c) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cm. How many hats in a total of 2000 will have sizes between
- 18 cm and 20 cm
  - Above 20 cm?
- (Give: For S. N. V. z, area between  $z = 0$  and  $z = 0.6$  is 0.2257, between  $z = 0$  and  $z = 0.2$  is 0.0793)

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If  $L\{f(t) = F(s)\}$ , then  $L\{tf(t)\} = \underline{\hspace{2cm}}$ .
 

|                            |                           |
|----------------------------|---------------------------|
| a) $\frac{d}{ds}\{F(s)\}$  | b) $\frac{1}{s} F(s)$     |
| c) $-\frac{d}{ds}\{F(s)\}$ | d) $\int_s^\infty F(s)ds$ |
- 2)  $L\left\{\int_0^t \cos h(t)dt\right\} = \underline{\hspace{2cm}}$ 

|                              |                        |
|------------------------------|------------------------|
| a) $\frac{s}{s^2 - 1}$       | b) $\frac{s}{s^2 + 1}$ |
| c) $-\frac{2s}{(s^2 - 1)^2}$ | d) $\frac{1}{s^2 - 1}$ |
- 3) In solving algebraic and transcendental equations, the rate convergence of Newton's Raphson method is \_\_\_\_\_.
 

|        |         |
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| a) 0.5 | b) 2    |
| c) 1.5 | d) 1.62 |
- 4) The number of strips required to use Weddle's rule is \_\_\_\_\_.
 

|                  |                  |
|------------------|------------------|
| a) Multiple of 6 | b) Multiple of 3 |
| c) Multiple of 2 | d) Any number    |
- 5) The order of error is Simpson's  $\frac{1}{3}$  rd rule is \_\_\_\_\_.
 

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| a) $h^3$ | b) $h^2$ |
| c) $h^4$ | d) $h^6$ |
- 6) A continuous random variable has the probability density function  $f(x) = kx^2$ , for  $0 \leq x \leq 2$  then  $k = \underline{\hspace{2cm}}$ .
 

|                  |                  |
|------------------|------------------|
| a) $\frac{8}{3}$ | b) $\frac{3}{2}$ |
| c) $\frac{5}{8}$ | d) $\frac{3}{8}$ |





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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three from the following. 09**

- Solve :  $(D^2 + 1)y = 3 + 5e^{-3x}$
- Solve :  $(D^3 - 4D)y = \cos(x)$
- Solve :  $p(1 + q) = qz$
- Solve :  $x^2p^2 + y^2q^2 = qz$
- Obtain the Fourier series of  $f(x) = 1 - x^2$  in  $-1 \leq x \leq 1$

**Q.3 Attempt any three from the followings. 09**

- Solve :  $(D^2 + 4)y = x \cos x$
- Solve :  $py = 2xy + \log q$
- Solve :  $y^4z p + zx^4q = xy^4$
- Obtain the half range sine series of the function  $f(x) = \pi x - x^2$  in  $(0, \pi)$
- Solve :  $(D^2 + 6D + 9)y = e^{-3x} \cos 2(x)$

**Q.4 Attempt any two from the following. 10**

- Solve the partial differential equation by method of separation of variables  
 $\frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = z$  where  $z(x, 0) = 6e^{-3x}$
- Obtain the Fourier series of the function series of the function  
 $f(x) = \frac{1}{4}(\pi - x)^2$   $0 \leq x \leq 2\pi$
- The equation of motion of a spring whose one and other end supports weight of 10 lbs is given by equation  $\frac{d^2x}{dt^2} + \frac{8}{25} \frac{dx}{dt} + 64x = 0$ .  
 If at  $t = 0$ ,  $x = 0.25$  and  $\frac{dx}{dt} = 0$ , then find the displacement ' $x$ ' at any time ' $t$ '

**Section – II**

**Q.5 Attempt any three of the following. 09**

- Find  $L\{e^{-3t}t \sin 4t\}$
- Find  $L^{-1}\left\{\frac{s}{(s-2)(s+3)}\right\}$
- Compute the coefficient of correlation between  $x$  and  $y$  from the data  
 $N = 20, \sum x = 80, \sum x^2 = 900, \sum y = 70, \sum y^2 = 800$  and  $\sum xy = 700$
- Evaluate  $\int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's 1/3<sup>rd</sup> rule with  $h = 0.25$

- e) Find a positive real root of the equation  $2x - 3 \sin x - 5 = 0$  correct to three decimal places by Regula Falsi method.

**Q.6 Attempt any three from the following.****09**

- a) The probability that a missile will strike the target is  $\frac{1}{5}$ . If six missiles are fixed, then using Binomial distribution find the probability that exactly two will strike the target.
- b) If the probability an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution determine the probability that out of 2000 individuals
- exactly 3,
  - at most 2 will suffer a bad reaction
- c) Find  $L^{-1}\left\{\frac{1}{s(s^2+9)}\right\}$  by convolution theorem.
- d) Find a positive real root of the equation  $xe^x - 2 = 0$  correct to three decimal places by Newton's Raphson method.
- e) Find the Laplace transform of  $t \sin 2t \cos 3t$

**Q.7 Attempt any two from the following.****10**

- a) Evaluate  $\int_0^{\infty} e^{-3t} t \sin t \, dt$  by Laplace transform
- b) Evaluate  $\int_0^{\pi} \frac{\sin x}{x} \, dx$  by dividing range into six equals parts, using Trapezoidal rule and Weddle's rule.
- c) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cm. How many hats in a total of 2000 will have sizes between
- 18 cm and 20 cm
  - Above 20 cm?
- (Give: For S. N. V. z, area between  $z = 0$  and  $z = 0.6$  is 0.2257, between  $z = 0$  and  $z = 0.2$  is 0.0793)

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 9 of 16

- Page 10 of 16

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three from the following.** **09**

- Solve :  $(D^2 + 1)y = 3 + 5e^{-3x}$
- Solve :  $(D^3 - 4D)y = \cos(x)$
- Solve :  $p(1 + q) = qz$
- Solve :  $x^2p^2 + y^2q^2 = qz$
- Obtain the Fourier series of  $f(x) = 1 - x^2$  in  $-1 \leq x \leq 1$

**Q.3 Attempt any three from the followings.** **09**

- Solve :  $(D^2 + 4)y = x \cos x$
- Solve :  $py = 2xy + \log q$
- Solve :  $y^4z p + zx^4q = xy^4$
- Obtain the half range sine series of the function  $f(x) = \pi x - x^2$  in  $(0, \pi)$
- Solve :  $(D^2 + 6D + 9)y = e^{-3x} \cos 2(x)$

**Q.4 Attempt any two from the following.** **10**

- Solve the partial differential equation by method of separation of variables  
 $\frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = z$  where  $z(x, 0) = 6e^{-3x}$
- Obtain the Fourier series of the function series of the function  
 $f(x) = \frac{1}{4}(\pi - x)^2$   $0 \leq x \leq 2\pi$
- The equation of motion of a spring whose one and other end supports weight of 10 lbs is given by equation  $\frac{d^2x}{dt^2} + \frac{8}{25} \frac{dx}{dt} + 64x = 0$ .  
 If at  $t = 0$ ,  $x = 0.25$  and  $\frac{dx}{dt} = 0$ , then find the displacement ' $x$ ' at any time ' $t$ '

**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Find  $L\{e^{-3t}t \sin 4t\}$
- Find  $L^{-1}\left\{\frac{s}{(s-2)(s+3)}\right\}$
- Compute the coefficient of correlation between  $x$  and  $y$  from the data  
 $N = 20, \sum x = 80, \sum x^2 = 900, \sum y = 70, \sum y^2 = 800$  and  $\sum xy = 700$
- Evaluate  $\int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's 1/3<sup>rd</sup> rule with  $h = 0.25$

- e) Find a positive real root of the equation  $2x - 3 \sin x - 5 = 0$  correct to three decimal places by Regula Falsi method.

**Q.6 Attempt any three from the following.****09**

- a) The probability that a missile will strike the target is  $\frac{1}{5}$ . If six missiles are fixed, then using Binomial distribution find the probability that exactly two will strike the target.
- b) If the probability an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution determine the probability that out of 2000 individuals
- exactly 3,
  - at most 2 will suffer a bad reaction
- c) Find  $L^{-1}\left\{\frac{1}{s(s^2+9)}\right\}$  by convolution theorem.
- d) Find a positive real root of the equation  $xe^x - 2 = 0$  correct to three decimal places by Newton's Raphson method.
- e) Find the Laplace transform of  $t \sin 2t \cos 3t$

**Q.7 Attempt any two from the following.****10**

- a) Evaluate  $\int_0^{\infty} e^{-3t} t \sin t \, dt$  by Laplace transform
- b) Evaluate  $\int_0^{\pi} \frac{\sin x}{x} \, dx$  by dividing range into six equals parts, using Trapezoidal rule and Weddle's rule.
- c) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cm. How many hats in a total of 2000 will have sizes between
- 18 cm and 20 cm
  - Above 20 cm?
- (Give: For S. N. V. z, area between  $z = 0$  and  $z = 0.6$  is 0.2257, between  $z = 0$  and  $z = 0.2$  is 0.0793)

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Max. Marks: 70

Marks: 14

14

- Page 13 of 16



- 8) A continuous random variable has the probability density function  $f(x) = kx^2$ , for  $0 \leq x \leq 2$  then  $k =$  \_\_\_\_\_.  
 a)  $\frac{8}{3}$  b)  $\frac{3}{2}$   
 c)  $\frac{5}{8}$  d)  $\frac{3}{8}$
- 9) The line of regression equations are given by  $10y = x + 17$  and  $x = 5y - 7$ , then mean  $\bar{x}$  and  $\bar{y}$  are respectively \_\_\_\_\_.  
 a) 1 and 10 b) 1 and 5  
 c) 3 and 2 d) 2 and 3
- 10) If the linear differential equation with constant coefficient has real root 'm' repeated twice, then the corresponding complementary functions \_\_\_\_\_.  
 a)  $c_1 e^{mx} + c_2 e^{-mx}$  b)  $c_1 \cos(mx) + c_2 \sin(mx)$   
 c)  $(c_1 + c_2 x)e^{mx}$  d)  $(c_1 + c_2 x)e^{-mx}$
- 11)  $\frac{1}{D^2} \{x^3\}$  is equal to \_\_\_\_\_.  
 a)  $\frac{x^5}{20}$  b)  $\frac{x^4}{12}$   
 c)  $x^3 e^{-x}$  d)  $20 x^5$
- 12) The particular integral of  $(D^2 + a^2)y = \cos(ax)$  is \_\_\_\_\_.  
 a)  $\frac{x}{2a} \cos(ax)$  b)  $\frac{x}{2a^2} \cos(ax)$   
 c)  $\frac{x}{2a} \sin(ax)$  d)  $\frac{x}{2a^2} \sin(ax)$
- 13) The solution of partial differential equation  $q = 3p^2$  is \_\_\_\_\_.  
 a)  $z = ax + \frac{a^2}{3} y + c$  b)  $z = 3ax + a^2 y + c$   
 c)  $z = 3a^2 x + by$  d)  $z = ax + 3a^2 y + c$
- 14) The general solution of partial differential equation  $pe^y = qe^x$  is \_\_\_\_\_.  
 a)  $z = a(e^{-x} + e^{-y}) + c$  b)  $z = a(e^{-x} - e^{-y}) + c$   
 c)  $z = a(e^x + e^y) + c$  d)  $z = a(e^x - e^y) + c$

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three from the following.** **09**

- Solve :  $(D^2 + 1)y = 3 + 5e^{-3x}$
- Solve :  $(D^3 - 4D)y = \cos(x)$
- Solve :  $p(1 + q) = qz$
- Solve :  $x^2p^2 + y^2q^2 = qz$
- Obtain the Fourier series of  $f(x) = 1 - x^2$  in  $-1 \leq x \leq 1$

**Q.3 Attempt any three from the followings.** **09**

- Solve :  $(D^2 + 4)y = x \cos x$
- Solve :  $py = 2xy + \log q$
- Solve :  $y^4z p + zx^4q = xy^4$
- Obtain the half range sine series of the function  $f(x) = \pi x - x^2$  in  $(0, \pi)$
- Solve :  $(D^2 + 6D + 9)y = e^{-3x} \cos 2(x)$

**Q.4 Attempt any two from the following.** **10**

- Solve the partial differential equation by method of separation of variables  
 $\frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = z$  where  $z(x, 0) = 6e^{-3x}$
- Obtain the Fourier series of the function series of the function  
 $f(x) = \frac{1}{4}(\pi - x)^2$   $0 \leq x \leq 2\pi$
- The equation of motion of a spring whose one and other end supports weight of 10 lbs is given by equation  $\frac{d^2x}{dt^2} + \frac{8}{25} \frac{dx}{dt} + 64x = 0$ .  
 If at  $t = 0$ ,  $x = 0.25$  and  $\frac{dx}{dt} = 0$ , then find the displacement ' $x$ ' at any time ' $t$ '

**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Find  $L\{e^{-3t}t \sin 4t\}$
- Find  $L^{-1}\left\{\frac{s}{(s-2)(s+3)}\right\}$
- Compute the coefficient of correlation between  $x$  and  $y$  from the data  
 $N = 20, \sum x = 80, \sum x^2 = 900, \sum y = 70, \sum y^2 = 800$  and  $\sum xy = 700$
- Evaluate  $\int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's 1/3<sup>rd</sup> rule with  $h = 0.25$

- e) Find a positive real root of the equation  $2x - 3 \sin x - 5 = 0$  correct to three decimal places by Regula Falsi method.

**Q.6 Attempt any three from the following.****09**

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- b) If the probability an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution determine the probability that out of 2000 individuals
- exactly 3,
  - at most 2 will suffer a bad reaction
- c) Find  $L^{-1}\left\{\frac{1}{s(s^2+9)}\right\}$  by convolution theorem.
- d) Find a positive real root of the equation  $xe^x - 2 = 0$  correct to three decimal places by Newton's Raphson method.
- e) Find the Laplace transform of  $t \sin 2t \cos 3t$

**Q.7 Attempt any two from the following.****10**

- a) Evaluate  $\int_0^{\infty} e^{-3t} t \sin t \, dt$  by Laplace transform
- b) Evaluate  $\int_0^{\pi} \frac{\sin x}{x} \, dx$  by dividing range into six equals parts, using Trapezoidal rule and Weddle's rule.
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- 18 cm and 20 cm
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- (Give: For S. N. V. z, area between  $z = 0$  and  $z = 0.6$  is 0.2257, between  $z = 0$  and  $z = 0.2$  is 0.0793)

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design Thinking**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What are the steps of the design thinking process?
  - a) Understand > Draw > Ideate > Create > Test > Implement
  - b) Empathize > Define > Ideate > Prototype > Test > Implement
  - c) Empathize > Design > Implement > Produce > Test
  - d) Understand > Define > Ideate > Produce > Try
- 2) Design Thinking Skills:
  - a) Emotional Intelligence
  - b) Consensus Building
  - c) Both (a) and (b)
  - d) None of these.
- 3) What step of design thinking has users try out your prototype?
  - a) Empathize
  - b) Define
  - c) Ideate
  - d) Test
- 4) Raw data can be gathered from consumers commonly by:
  - a) Interviewing
  - b) Facilitating focus groups
  - c) Observing the products in use
  - d) All of the above
- 5) Focus groups are one of the methods for:
  - a) Interpreting raw data collected from customers
  - b) Organizing data into a hierarchy of customer needs
  - c) Gathering raw data from customers
  - d) Reflecting on the results and the process of identifying customer need
- 6) Tools for gathering customer needs is \_\_\_\_\_.
  - a) Interviews
  - b) Questionnaires
  - c) Be the customer
  - d) All of the above
- 7) Prototyping process requires \_\_\_\_\_.
  - a) Engagement and data
  - b) Collaboration, working with others
  - c) Commitment to ones goals
  - d) Discipline, being the best

- 8) Brainstorming, the method of generating ideas relies in two rules:
- Quality ideas and small groups of participants
  - Multiple mini sessions with small groups of participants
  - Large groups of participants and more than a hundred ideas per hour
  - Large quantity of ideas and differing judgment (avoid censoring ideas)
- 9) What are some characteristics of a service?
- Intangible
  - Inflexible
  - Fluctuating desire
  - Co-managed
- 10) What is an aspect of service design?
- Resources to connect people and/or machines
  - Environmental
  - Process and experience
  - All of above
- 11) Figure -1 shows the conceptual drawing of a (n) \_\_\_\_\_ architecture.

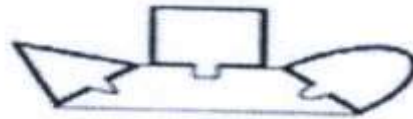


Figure 10-1

- Slot-modular
  - Bus-modular
  - Sectional-modular
  - Integral
- 12) Product architecture is the assignment of the \_\_\_\_\_ elements of a product to \_\_\_\_\_ building blocks of the product.
- Functional; conceptual
  - Functional; physical
  - Non-functional; conceptual
  - Non-functional: physical
- 13) Infrastructure Sustainability can be achieved by \_\_\_\_\_.
- Optimum use of resources
  - Minimum use of resources
  - Constructing more and more concrete structures
  - Using materials having high carbon footprint
- 14) The Design for environment is done for
- Part of product
  - Entire product
  - Entire life cycle of product
  - Any of the above

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design Thinking**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |                                                                                                                            |           |
|------------|----------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> What is meant by the Design Thinking? What are the stages of design thinking? Explain in details.                | <b>06</b> |
|            | <b>b)</b> Explain the design thinking skills with some examples.                                                           | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> What do you meant by product specification? Explain it in briefly.                                               | <b>04</b> |
|            | <b>b)</b> What do you meant by customer need identification? What are the different goals of customer need identification? | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> What do you meant by creativity? Explain in short.                                                               | <b>04</b> |
|            | <b>b)</b> What do you meant by prototyping? Enlist and explain are the different methods of prototyping.                   | <b>05</b> |
| <b>Q.5</b> | <b>a)</b> Explain the different design thinking mindset.                                                                   | <b>04</b> |
|            | <b>b)</b> Explain the brainstorming.                                                                                       | <b>05</b> |

**Section – II**

- |            |                                                                                                                                          |           |
|------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.6</b> | <b>a)</b> What is Service Design? What are the different principles of service design and tools for the service design thinking?         | <b>06</b> |
|            | <b>b)</b> Write a note on modular product architecture.                                                                                  | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> What is meant by financial analysis and why financial analysis is needed?                                                      | <b>04</b> |
|            | <b>b)</b> What is product architecture and importance of product architecture? What is the different aspect of the product architecture? | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> What are the different principles to a product life cycle?                                                                     | <b>04</b> |
|            | <b>b)</b> What is the environmental impact over the life cycle? Explain in short.                                                        | <b>05</b> |
| <b>Q.9</b> | <b>a)</b> Draw & explain the design for environment process.                                                                             | <b>04</b> |
|            | <b>b)</b> Write a note on Agile Product Development Process.                                                                             | <b>05</b> |

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design Thinking**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Brainstorming, the method of generating ideas relies in two rules:
  - a) Quality ideas and small groups of participants
  - b) Multiple mini sessions with small groups of participants
  - c) Large groups of participants and more than a hundred ideas per hour
  - d) Large quantity of ideas and differing judgment (avoid censoring ideas)
- 2) What are some characteristics of a service?
  - a) Intangible
  - b) Inflexible
  - c) Fluctuating desire
  - d) Co-managed
- 3) What is an aspect of service design?
  - a) Resources to connect people and/or machines
  - b) Environmental
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  - d) All of above
- 4) Figure -1 shows the conceptual drawing of a (n) \_\_\_\_\_ architecture.

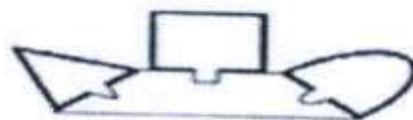


Figure 10-1

- a) Slot-modular
  - b) Bus-modular
  - c) Sectional-modular
  - d) Integral
- 5) Product architecture is the assignment of the \_\_\_\_\_ elements of a product to \_\_\_\_\_ building blocks of the product.
  - a) Functional; conceptual
  - b) Functional; physical
  - c) Non-functional; conceptual
  - d) Non-functional: physical

- 6) Infrastructure Sustainability can be achieved by \_\_\_\_\_.  
a) Optimum use of resources  
b) Minimum use of resources  
c) Constructing more and more concrete structures  
d) Using materials having high carbon footprint
- 7) The Design for environment is done for  
a) Part of product  
b) Entire product  
c) Entire life cycle of product  
d) Any of the above
- 8) What are the steps of the design thinking process?  
a) Understand > Draw > Ideate > Create > Test > Implement  
b) Empathize > Define > Ideate > Prototype > Test > Implement  
c) Empathize > Design > Implement > Produce > Test  
d) Understand > Define > Ideate > Produce > Try
- 9) Design Thinking Skills:  
a) Emotional Intelligence  
b) Consensus Building  
c) Both (a) and (b)  
d) None of these.
- 10) What step of design thinking has users try out your prototype?  
a) Empathize  
b) Define  
c) Ideate  
d) Test
- 11) Raw data can be gathered from consumers commonly by:  
a) Interviewing  
b) Facilitating focus groups  
c) Observing the products in use  
d) All of the above
- 12) Focus groups are one of the methods for:  
a) Interpreting raw data collected from customers  
b) Organizing data into a hierarchy of customer needs  
c) Gathering raw data from customers  
d) Reflecting on the results and the process of identifying customer need
- 13) Tools for gathering customer needs is \_\_\_\_\_.  
a) Interviews  
b) Questionnaires  
c) Be the customer  
d) All of the above
- 14) Prototyping process requires \_\_\_\_\_.  
a) Engagement and data  
b) Collaboration, working with others  
c) Commitment to ones goals  
d) Discipline, being the best



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design Thinking**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |                                                                                                                            |           |
|------------|----------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> What is meant by the Design Thinking? What are the stages of design thinking? Explain in details.                | <b>06</b> |
|            | <b>b)</b> Explain the design thinking skills with some examples.                                                           | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> What do you meant by product specification? Explain it in briefly.                                               | <b>04</b> |
|            | <b>b)</b> What do you meant by customer need identification? What are the different goals of customer need identification? | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> What do you meant by creativity? Explain in short.                                                               | <b>04</b> |
|            | <b>b)</b> What do you meant by prototyping? Enlist and explain are the different methods of prototyping.                   | <b>05</b> |
| <b>Q.5</b> | <b>a)</b> Explain the different design thinking mindset.                                                                   | <b>04</b> |
|            | <b>b)</b> Explain the brainstorming.                                                                                       | <b>05</b> |

**Section – II**

- |            |                                                                                                                                          |           |
|------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.6</b> | <b>a)</b> What is Service Design? What are the different principles of service design and tools for the service design thinking?         | <b>06</b> |
|            | <b>b)</b> Write a note on modular product architecture.                                                                                  | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> What is meant by financial analysis and why financial analysis is needed?                                                      | <b>04</b> |
|            | <b>b)</b> What is product architecture and importance of product architecture? What is the different aspect of the product architecture? | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> What are the different principles to a product life cycle?                                                                     | <b>04</b> |
|            | <b>b)</b> What is the environmental impact over the life cycle? Explain in short.                                                        | <b>05</b> |
| <b>Q.9</b> | <b>a)</b> Draw & explain the design for environment process.                                                                             | <b>04</b> |
|            | <b>b)</b> Write a note on Agile Product Development Process.                                                                             | <b>05</b> |

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- 6) Design Thinking Skills:  
a) Emotional Intelligence                      b) Consensus Building  
c) Both (a) and (b)                              d) None of these.
- 7) What step of design thinking has users try out your prototype?  
a) Empathize                                      b) Define  
c) Ideate                                              d) Test
- 8) Raw data can be gathered from consumers commonly by:  
a) Interviewing                                      b) Facilitating focus groups  
c) Observing the products in use              d) All of the above
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- 10) Tools for gathering customer needs is \_\_\_\_\_.  
a) Interviews                                      b) Questionnaires  
c) Be the customer                                d) All of the above
- 11) Prototyping process requires \_\_\_\_\_.  
a) Engagement and data  
b) Collaboration, working with others  
c) Commitment to ones goals  
d) Discipline, being the best
- 12) Brainstorming, the method of generating ideas relies in two rules:  
a) Quality ideas and small groups of participants  
b) Multiple mini sessions with small groups of participants  
c) Large groups of participants and more than a hundred ideas per hour  
d) Large quantity of ideas and differing judgment (avoid censoring ideas)
- 13) What are some characteristics of a service?  
a) Intangible                                      b) Inflexible  
c) Fluctuating desire                              d) Co-managed
- 14) What is an aspect of service design?  
a) Resources to connect people and/or machines  
b) Environmental  
c) Process and experience  
d) All of above

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Design Thinking**

Day & Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |                                                                                                                            |           |
|------------|----------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> What is meant by the Design Thinking? What are the stages of design thinking? Explain in details.                | <b>06</b> |
|            | <b>b)</b> Explain the design thinking skills with some examples.                                                           | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> What do you meant by product specification? Explain it in briefly.                                               | <b>04</b> |
|            | <b>b)</b> What do you meant by customer need identification? What are the different goals of customer need identification? | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> What do you meant by creativity? Explain in short.                                                               | <b>04</b> |
|            | <b>b)</b> What do you meant by prototyping? Enlist and explain are the different methods of prototyping.                   | <b>05</b> |
| <b>Q.5</b> | <b>a)</b> Explain the different design thinking mindset.                                                                   | <b>04</b> |
|            | <b>b)</b> Explain the brainstorming.                                                                                       | <b>05</b> |

**Section – II**

- |            |                                                                                                                                          |           |
|------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.6</b> | <b>a)</b> What is Service Design? What are the different principles of service design and tools for the service design thinking?         | <b>06</b> |
|            | <b>b)</b> Write a note on modular product architecture.                                                                                  | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> What is meant by financial analysis and why financial analysis is needed?                                                      | <b>04</b> |
|            | <b>b)</b> What is product architecture and importance of product architecture? What is the different aspect of the product architecture? | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> What are the different principles to a product life cycle?                                                                     | <b>04</b> |
|            | <b>b)</b> What is the environmental impact over the life cycle? Explain in short.                                                        | <b>05</b> |
| <b>Q.9</b> | <b>a)</b> Draw & explain the design for environment process.                                                                             | <b>04</b> |
|            | <b>b)</b> Write a note on Agile Product Development Process.                                                                             | <b>05</b> |

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Design Thinking**

Day & Date: Thursday, 16-03-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:**
- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
  - 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
  - 3) Figures to the right indicates full marks.
  - 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Tools for gathering customer needs is \_\_\_\_\_.
  - a) Interviews
  - b) Questionnaires
  - c) Be the customer
  - d) All of the above
- 2) Prototyping process requires \_\_\_\_\_.
  - a) Engagement and data
  - b) Collaboration, working with others
  - c) Commitment to ones goals
  - d) Discipline, being the best
- 3) Brainstorming, the method of generating ideas relies in two rules:
  - a) Quality ideas and small groups of participants
  - b) Multiple mini sessions with small groups of participants
  - c) Large groups of participants and more than a hundred ideas per hour
  - d) Large quantity of ideas and differing judgment (avoid censoring ideas)
- 4) What are some characteristics of a service?
  - a) Intangible
  - b) Inflexible
  - c) Fluctuating desire
  - d) Co-managed
- 5) What is an aspect of service design?
  - a) Resources to connect people and/or machines
  - b) Environmental
  - c) Process and experience
  - d) All of above
- 6) Figure -1 shows the conceptual drawing of a (n) \_\_\_\_\_ architecture.



Figure 10-1

- a) Slot-modular
- b) Bus-modular
- c) Sectional-modular
- d) Integral

- 7) Product architecture is the assignment of the \_\_\_\_\_ elements of a product to \_\_\_\_\_ building blocks of the product.
- a) Functional; conceptual
  - b) Functional; physical
  - c) Non-functional; conceptual
  - d) Non-functional: physical
- 8) Infrastructure Sustainability can be achieved by \_\_\_\_\_.
- a) Optimum use of resources
  - b) Minimum use of resources
  - c) Constructing more and more concrete structures
  - d) Using materials having high carbon footprint
- 9) The Design for environment is done for
- a) Part of product
  - b) Entire product
  - c) Entire life cycle of product
  - d) Any of the above
- 10) What are the steps of the design thinking process?
- a) Understand > Draw > Ideate > Create > Test> Implement
  - b) Empathize > Define > Ideate > Prototype > Test> Implement
  - c) Empathize > Design > Implement > Produce > Test
  - d) Understand > Define > Ideate > Produce > Try
- 11) Design Thinking Skills:
- a) Emotional Intelligence
  - b) Consensus Building
  - c) Both (a) and (b)
  - d) None of these.
- 12) What step of design thinking has users try out your prototype?
- a) Empathize
  - b) Define
  - c) Ideate
  - d) Test
- 13) Raw data can be gathered from consumers commonly by:
- a) Interviewing
  - b) Facilitating focus groups
  - c) Observing the products in use
  - d) All of the above
- 14) Focus groups are one of the methods for:
- a) Interpreting raw data collected from customers
  - b) Organizing data into a hierarchy of customer needs
  - c) Gathering raw data from customers
  - d) Reflecting on the results and the process of identifying customer need

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Design Thinking**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary and mention it clearly.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

- |            |                                                                                                                            |           |
|------------|----------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> What is meant by the Design Thinking? What are the stages of design thinking? Explain in details.                | <b>06</b> |
|            | <b>b)</b> Explain the design thinking skills with some examples.                                                           | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> What do you meant by product specification? Explain it in briefly.                                               | <b>04</b> |
|            | <b>b)</b> What do you meant by customer need identification? What are the different goals of customer need identification? | <b>05</b> |
| <b>Q.4</b> | <b>a)</b> What do you meant by creativity? Explain in short.                                                               | <b>04</b> |
|            | <b>b)</b> What do you meant by prototyping? Enlist and explain are the different methods of prototyping.                   | <b>05</b> |
| <b>Q.5</b> | <b>a)</b> Explain the different design thinking mindset.                                                                   | <b>04</b> |
|            | <b>b)</b> Explain the brainstorming.                                                                                       | <b>05</b> |

**Section – II**

- |            |                                                                                                                                          |           |
|------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.6</b> | <b>a)</b> What is Service Design? What are the different principles of service design and tools for the service design thinking?         | <b>06</b> |
|            | <b>b)</b> Write a note on modular product architecture.                                                                                  | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> What is meant by financial analysis and why financial analysis is needed?                                                      | <b>04</b> |
|            | <b>b)</b> What is product architecture and importance of product architecture? What is the different aspect of the product architecture? | <b>05</b> |
| <b>Q.8</b> | <b>a)</b> What are the different principles to a product life cycle?                                                                     | <b>04</b> |
|            | <b>b)</b> What is the environmental impact over the life cycle? Explain in short.                                                        | <b>05</b> |
| <b>Q.9</b> | <b>a)</b> Draw & explain the design for environment process.                                                                             | <b>04</b> |
|            | <b>b)</b> Write a note on Agile Product Development Process.                                                                             | <b>05</b> |

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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Supply Engineering**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Air binding phenomena in rapid sand filter may occur due to \_\_\_\_\_.  
 a) Excessive negative pressure      b) Mud ball formation  
 c) Higher turbidity in the effluent      d) None of the above
- 2) Reflux valves are also known as \_\_\_\_\_ valves.  
 a) Shut off      b) Check  
 c) Cut off      d) Air relief
- 3) Water losses in water supply is assumed as \_\_\_\_\_.  
 a) Test pressure      b) Working pressure  
 c) Pipe pressure      d) Design pressure
- 4) \_\_\_\_\_ is the pipe connecting to storage tank various fixtures and taps.  
 a) Distributing pipe      b) Supply pipe  
 c) Antisiphonage pipe      d) Service pipe
- 5) Tube settlers are installed in the sedimentation tank to \_\_\_\_\_.  
 a) Increase detention time      b) Reduce Surface loading  
 c) Both a) and b)      d) None of the above
- 6) Generally, \_\_\_\_\_ water supply will reduce water demand of a city.  
 a) Continuous      b) Intermittent  
 c) Both a) and b)      d) None of the above
- 7) Analysis of pipe networks of distribution system is calculated by \_\_\_\_\_.  
 a) Discharge in pipelines      b) Equivalent pipe method  
 c) Computation of pressure      d) Mass Curve Method
- 8) To control the wastage of water \_\_\_\_\_ measures are taken.  
 a) Pipe joints      b) Water taps  
 c) Zoning system      d) All of the above
- 9) For ideal settling basin  $V_s$  is settling velocity. If particle is having settling velocity ( $V_s'$ ) less than  $V_s$ , then particle will be removed with \_\_\_\_\_.  
 a) Less than 100%      b) 100%  
 c) 0%      d) None of the above



- 10)** Zeolite is \_\_\_\_\_.  
a) A naturally occurring salt      b) Hydrated silica  
c) Dehydrated calcium silicate      d) Silicon carbide
- 11)**  $\text{CO}_3^{2-}$  in water indicates \_\_\_\_\_.  
a) Acidity in water      b) Alkalinity in water  
c) Acidity and alkalinity in water      d) None of the above
- 12)** \_\_\_\_\_ can follow direct routes and require shorter length of conduits.  
a) Gravity conduit      b) Aqueduct  
c) Tunnels      d) Pressure conduits
- 13)** For a city developed haphazardly, the layout of distribution pipes preferred to is \_\_\_\_\_.  
a) Radial system      b) Ring system  
c) Dead end system      d) Iron grid system
- 14)** Precipitation of non-carbonate hardness is done by addition of \_\_\_\_\_.  
a) Soda ash      b) Lime  
c) Zeolites      d) Sodium chloride

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P

**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Supply Engineering**

Day &amp; Date: Monday, 06-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q.2 is compulsory in section I, attempt any two out of Q.3 to Q.5  
 2) Q. 6 is compulsory in section II, attempt any two out of Q.7 to Q.9  
 3) Figures to the right indicate full marks  
 4) Assume suitable data wherever necessary and mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Find the population and of a city in 2041 by geometric increase method. **06**

| Year | Population |
|------|------------|
| 1981 | 40,000     |
| 1991 | 60,000     |
| 2001 | 85,000     |
| 2011 | 115,000    |
| 2021 | 2,00,000   |

- b)** Calculate the fire demand for the same city having Population of year 2041 using various formulae. (Question 02 (a)). **04**

- Q.3 a)** A settling tank is designed for an overflow rate of 4000 lit./m<sup>2</sup>/hr. What percentage of particles of diameter **05**

i) 0.06 mm and ii) 0.03 mm will be removed in this tank?  
 Temperature of water is 10°C and specific gravity of particles is 2.65.

- b)** Enlist various limitations of aeration process in tropical countries. **04**

- Q.4 a)** Design underdrainage system for rapid sand filter for 26 MLD of water flow. **05**

- b)** Write short note on Ion exchange method. **04**

- Q.5 a)** Maximum daily demand of water in a city is 130 MLD. Design cascade aerator for the same. Draw plan and elevation of the aerator. Assume the inlet pipe diameter as 1.1 m. **05**

- b)** Explain water hammer pressure with a neat sketch. **04**

**Section – II**

- Q.6 a)** A large service reservoir supplies water to two colonies. **05**

Colony A - Population 12000

Colony B - Population 60000

Determine the diameter of supply pipe. Average daily demand is 200 lpcd

- b)** Discuss intermittent water supply system. **05**

|            |           |                                                            |           |
|------------|-----------|------------------------------------------------------------|-----------|
| <b>Q.7</b> | <b>a)</b> | <b>Write short notes on</b>                                | <b>05</b> |
|            |           | 1) Action of bleaching powder                              |           |
|            |           | 2) Chloramines                                             |           |
|            | <b>b)</b> | Discuss the various methods of Disinfection.               | <b>04</b> |
| <b>Q.8</b> | <b>a)</b> | Discuss Packaged drinking water plant with a neat diagram. | <b>05</b> |
|            | <b>b)</b> | Explain various methods of Membrane Filtration.            | <b>04</b> |
| <b>Q.9</b> | <b>a)</b> | Explain the various types of storage reservoirs.           | <b>05</b> |
|            | <b>b)</b> | Discuss the different types of losses in pipes.            | <b>04</b> |

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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Supply Engineering**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) To control the wastage of water \_\_\_\_\_ measures are taken.
  - a) Pipe joints
  - b) Water taps
  - c) Zoning system
  - d) All of the above
- 2) For ideal settling basin  $V_s$  is settling velocity. If particle is having settling velocity ( $V_s'$ ) less than  $V_s$ , then particle will be removed with \_\_\_\_\_.
  - a) Less than 100%
  - b) 100%
  - c) 0%
  - d) None of the above
- 3) Zeolite is \_\_\_\_\_.
  - a) A naturally occurring salt
  - b) Hydrated silica
  - c) Dehydrated calcium silicate
  - d) Silicon carbide
- 4)  $\text{CO}_3^{2-}$  in water indicates \_\_\_\_\_.
  - a) Acidity in water
  - b) Alkalinity in water
  - c) Acidity and alkalinity in water
  - d) None of the above
- 5) \_\_\_\_\_ can follow direct routes and require shorter length of conduits.
  - a) Gravity conduit
  - b) Aqueduct
  - c) Tunnels
  - d) Pressure conduits
- 6) For a city developed haphazardly, the layout of distribution pipes preferred to is \_\_\_\_\_.
  - a) Radial system
  - b) Ring system
  - c) Dead end system
  - d) Iron grid system
- 7) Precipitation of non-carbonate hardness is done by addition of \_\_\_\_\_.
  - a) Soda ash
  - b) Lime
  - c) Zeolites
  - d) Sodium chloride
- 8) Air binding phenomena in rapid sand filter may occur due to \_\_\_\_\_.
  - a) Excessive negative pressure
  - b) Mud ball formation
  - c) Higher turbidity in the effluent
  - d) None of the above
- 9) Reflux valves are also known as \_\_\_\_\_ valves.
  - a) Shut off
  - b) Check
  - c) Cut off
  - d) Air relief

- 10) Water losses in water supply is assumed as \_\_\_\_\_.
  - a) Test pressure
  - b) Working pressure
  - c) Pipe pressure
  - d) Design pressure
- 11) \_\_\_\_\_ is the pipe connecting to storage tank various fixtures and taps.
  - a) Distributing pipe
  - b) Supply pipe
  - c) Antisiphonage pipe
  - d) Service pipe
- 12) Tube settlers are installed in the sedimentation tank to \_\_\_\_\_.
  - a) Increase detention time
  - b) Reduce Surface loading
  - c) Both a) and b)
  - d) None of the above
- 13) Generally, \_\_\_\_\_ water supply will reduce water demand of a city.
  - a) Continuous
  - b) Intermittent
  - c) Both a) and b)
  - d) None of the above
- 14) Analysis of pipe networks of distribution system is calculated by \_\_\_\_\_.
  - a) Discharge in pipelines
  - b) Equivalent pipe method
  - c) Computation of pressure
  - d) Mass Curve Method

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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Supply Engineering**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Q.2 is compulsory in section I, attempt any two out of Q.3 to Q.5  
 2) Q. 6 is compulsory in section II, attempt any two out of Q.7 to Q.9  
 3) Figures to the right indicate full marks  
 4) Assume suitable data wherever necessary and mention it clearly.  
 5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Find the population and of a city in 2041 by geometric increase method. **06**

| Year | Population |
|------|------------|
| 1981 | 40,000     |
| 1991 | 60,000     |
| 2001 | 85,000     |
| 2011 | 115,000    |
| 2021 | 2,00,000   |

- b)** Calculate the fire demand for the same city having Population of year 2041 using various formulae. (Question 02 (a)). **04**

- Q.3 a)** A settling tank is designed for an overflow rate of 4000 lit./m<sup>2</sup>/hr. What percentage of particles of diameter **05**

i) 0.06 mm and ii) 0.03 mm will be removed in this tank?  
 Temperature of water is 10°C and specific gravity of particles is 2.65.

- b)** Enlist various limitations of aeration process in tropical countries. **04**

- Q.4 a)** Design underdrainage system for rapid sand filter for 26 MLD of water flow. **05**

- b)** Write short note on Ion exchange method. **04**

- Q.5 a)** Maximum daily demand of water in a city is 130 MLD. Design cascade aerator for the same. Draw plan and elevation of the aerator. Assume the inlet pipe diameter as 1.1 m. **05**

- b)** Explain water hammer pressure with a neat sketch. **04**

**Section – II**

- Q.6 a)** A large service reservoir supplies water to two colonies. **05**

Colony A - Population 12000

Colony B - Population 60000

Determine the diameter of supply pipe. Average daily demand is 200 lpcd

- b)** Discuss intermittent water supply system. **05**

|            |           |                                                            |           |
|------------|-----------|------------------------------------------------------------|-----------|
| <b>Q.7</b> | <b>a)</b> | <b>Write short notes on</b>                                | <b>05</b> |
|            |           | 1) Action of bleaching powder                              |           |
|            |           | 2) Chloramines                                             |           |
|            | <b>b)</b> | Discuss the various methods of Disinfection.               | <b>04</b> |
| <b>Q.8</b> | <b>a)</b> | Discuss Packaged drinking water plant with a neat diagram. | <b>05</b> |
|            | <b>b)</b> | Explain various methods of Membrane Filtration.            | <b>04</b> |
| <b>Q.9</b> | <b>a)</b> | Explain the various types of storage reservoirs.           | <b>05</b> |
|            | <b>b)</b> | Discuss the different types of losses in pipes.            | <b>04</b> |

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Set **R**

**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Supply Engineering**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1)  $\text{CO}_3^{2-}$  in water indicates \_\_\_\_\_.  
 a) Acidity in water                      b) Alkalinity in water  
 c) Acidity and alkalinity in water    d) None of the above
- 2) \_\_\_\_\_ can follow direct routes and require shorter length of conduits.  
 a) Gravity conduit                      b) Aqueduct  
 c) Tunnels                                  d) Pressure conduits
- 3) For a city developed haphazardly, the layout of distribution pipes preferred to is \_\_\_\_\_.  
 a) Radial system                      b) Ring system  
 c) Dead end system                      d) Iron grid system
- 4) Precipitation of non-carbonate hardness is done by addition of \_\_\_\_\_.  
 a) Soda ash                                  b) Lime  
 c) Zeolites                                  d) Sodium chloride
- 5) Air binding phenomena in rapid sand filter may occur due to \_\_\_\_\_.  
 a) Excessive negative pressure    b) Mud ball formation  
 c) Higher turbidity in the effluent    d) None of the above
- 6) Reflux valves are also known as \_\_\_\_\_ valves.  
 a) Shut off                                  b) Check  
 c) Cut off                                  d) Air relief
- 7) Water losses in water supply is assumed as \_\_\_\_\_.  
 a) Test pressure                      b) Working pressure  
 c) Pipe pressure                      d) Design pressure
- 8) \_\_\_\_\_ is the pipe connecting to storage tank various fixtures and taps.  
 a) Distributing pipe                      b) Supply pipe  
 c) Antisiphonage pipe                      d) Service pipe
- 9) Tube settlers are installed in the sedimentation tank to \_\_\_\_\_.  
 a) Increase detention time              b) Reduce Surface loading  
 c) Both a) and b)                      d) None of the above





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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**

**CIVIL ENGINEERING**

**Water Supply Engineering**

Day & Date: Monday, 06-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Q.2 is compulsory in section I, attempt any two out of Q.3 to Q.5  
2) Q. 6 is compulsory in section II, attempt any two out of Q.7 to Q.9  
3) Figures to the right indicate full marks  
4) Assume suitable data wherever necessary and mention it clearly.  
5) Use of non-programmable calculator is allowed.

**Section – I**

- Q.2 a)** Find the population and of a city in 2041 by geometric increase method. **06**

| Year | Population |
|------|------------|
| 1981 | 40,000     |
| 1991 | 60,000     |
| 2001 | 85,000     |
| 2011 | 115,000    |
| 2021 | 2,00,000   |

- b)** Calculate the fire demand for the same city having Population of year 2041 using various formulae. (Question 02 (a)). **04**

- Q.3 a)** A settling tank is designed for an overflow rate of 4000 lit./m<sup>2</sup>/hr. What percentage of particles of diameter **05**

i) 0.06 mm and ii) 0.03 mm will be removed in this tank?  
Temperature of water is 10°C and specific gravity of particles is 2.65.

- b)** Enlist various limitations of aeration process in tropical countries. **04**

- Q.4 a)** Design underdrainage system for rapid sand filter for 26 MLD of water flow. **05**

- b)** Write short note on Ion exchange method. **04**

- Q.5 a)** Maximum daily demand of water in a city is 130 MLD. Design cascade aerator for the same. Draw plan and elevation of the aerator. Assume the inlet pipe diameter as 1.1 m. **05**

- b)** Explain water hammer pressure with a neat sketch. **04**

**Section – II**

- Q.6 a)** A large service reservoir supplies water to two colonies. **05**

Colony A - Population 12000

Colony B - Population 60000

Determine the diameter of supply pipe. Average daily demand is 200 lpcd

- b)** Discuss intermittent water supply system. **05**

|            |           |                                                            |           |
|------------|-----------|------------------------------------------------------------|-----------|
| <b>Q.7</b> | <b>a)</b> | <b>Write short notes on</b>                                | <b>05</b> |
|            |           | 1) Action of bleaching powder                              |           |
|            |           | 2) Chloramines                                             |           |
|            | <b>b)</b> | Discuss the various methods of Disinfection.               | <b>04</b> |
| <b>Q.8</b> | <b>a)</b> | Discuss Packaged drinking water plant with a neat diagram. | <b>05</b> |
|            | <b>b)</b> | Explain various methods of Membrane Filtration.            | <b>04</b> |
| <b>Q.9</b> | <b>a)</b> | Explain the various types of storage reservoirs.           | <b>05</b> |
|            | <b>b)</b> | Discuss the different types of losses in pipes.            | <b>04</b> |

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Set **S**

**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Water Supply Engineering**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Generally, \_\_\_\_\_ water supply will reduce water demand of a city.
  - a) Continuous
  - b) Intermittent
  - c) Both a) and b)
  - d) None of the above
- 2) Analysis of pipe networks of distribution system is calculated by \_\_\_\_\_.
  - a) Discharge in pipelines
  - b) Equivalent pipe method
  - c) Computation of pressure
  - d) Mass Curve Method
- 3) To control the wastage of water \_\_\_\_\_ measures are taken.
  - a) Pipe joints
  - b) Water taps
  - c) Zoning system
  - d) All of the above
- 4) For ideal settling basin  $V_s$  is settling velocity. If particle is having settling velocity ( $V_s'$ ) less than  $V_s$ , then particle will be removed with \_\_\_\_\_.
  - a) Less than 100%
  - b) 100%
  - c) 0%
  - d) None of the above
- 5) Zeolite is \_\_\_\_\_.
  - a) A naturally occurring salt
  - b) Hydrated silica
  - c) Dehydrated calcium silicate
  - d) Silicon carbide
- 6)  $\text{CO}_3^{2-}$  in water indicates \_\_\_\_\_.
  - a) Acidity in water
  - b) Alkalinity in water
  - c) Acidity and alkalinity in water
  - d) None of the above
- 7) \_\_\_\_\_ can follow direct routes and require shorter length of conduits.
  - a) Gravity conduit
  - b) Aqueduct
  - c) Tunnels
  - d) Pressure conduits
- 8) For a city developed haphazardly, the layout of distribution pipes preferred to is \_\_\_\_\_.
  - a) Radial system
  - b) Ring system
  - c) Dead end system
  - d) Iron grid system
- 9) Precipitation of non-carbonate hardness is done by addition of \_\_\_\_\_.
  - a) Soda ash
  - b) Lime
  - c) Zeolites
  - d) Sodium chloride

- 10)** Air binding phenomena in rapid sand filter may occur due to \_\_\_\_\_.  
a) Excessive negative pressure      b) Mud ball formation  
c) Higher turbidity in the effluent      d) None of the above
- 11)** Reflux valves are also known as \_\_\_\_\_ valves.  
a) Shut off      b) Check  
c) Cut off      d) Air relief
- 12)** Water losses in water supply is assumed as \_\_\_\_\_.  
a) Test pressure      b) Working pressure  
c) Pipe pressure      d) Design pressure
- 13)** \_\_\_\_\_ is the pipe connecting to storage tank various fixtures and taps.  
a) Distributing pipe      b) Supply pipe  
c) Antisiphonage pipe      d) Service pipe
- 14)** Tube settlers are installed in the sedimentation tank to \_\_\_\_\_.  
a) Increase detention time      b) Reduce Surface loading  
c) Both a) and b)      d) None of the above

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| Set | S |
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**CIVIL ENGINEERING**  
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Day & Date: Monday, 06-03-2023  
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Max. Marks: 56

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|            |           |                                                            |           |
|------------|-----------|------------------------------------------------------------|-----------|
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**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 1 of 20





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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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**Section – I**

- Q.2** A masonry pier of 3 m x 4 m supports a vertical load of 80 kN as shown in Fig. 1 **10**  
 a) find the stresses developed at each corner of the pier  
 b) what additional load should be placed at the center of the pier, so that there is no tension anywhere in the pier section  
 c) what are the stresses at the corners with the additional load in the center

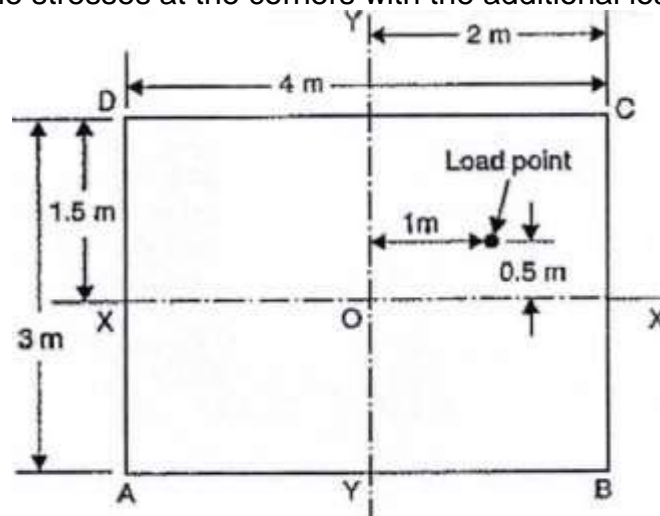


Fig.-1

- Q.3** A simply supported beam AB of span 4 m as shown in Fig.-2., carries a point load of 100 kN at its center C. the value of 'I' for the left half is  $1 \times 10^8 \text{ mm}^4$  and for the right half portion 'I' is  $2 \times 10^8 \text{ mm}^4$ . Find the slopes at the two supports and deflection under the load. Take  $E = 200 \text{ GN/m}^2$  **09**

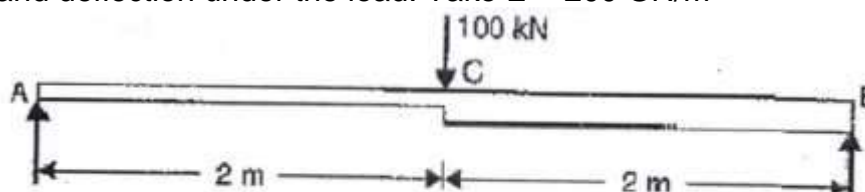


Fig.-2

- Q.4** A three hinged parabolic arch of span 40 m and rise 10 m carries a uniformly distributed load of 30 kN/m over left half span as shown in Fig.-3. Find horizontal thrust and support reaction.

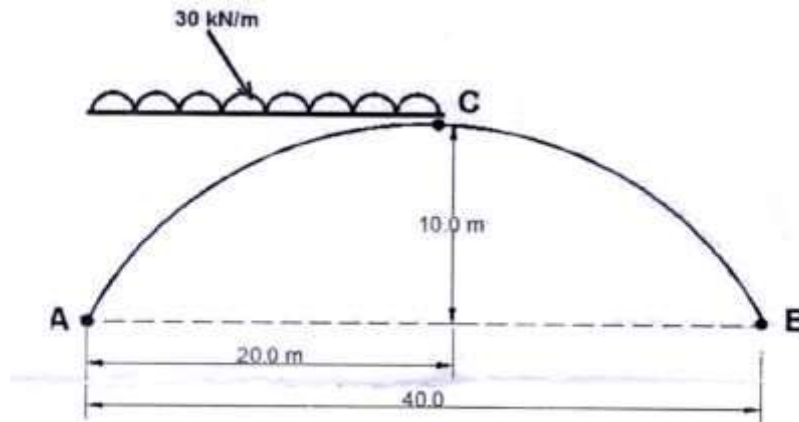


Fig.-3

- Q.5** A masonry trapezoidal dam 4 m high, 1 m wide at its top and 3 m width at its bottom retain water on its vertical face. Determine the maximum and minimum stresses at the base.

09

i) when the reservoir is full

Take the weight of masonry as  $19.62 \text{ kN/m}^3$ . Weight of water as  $9810 \text{ N/m}^3$ .

### Section – II

- Q.6** Analyze the continuous beam as shown in Fig.- 4 and draw bending moment diagram.

10

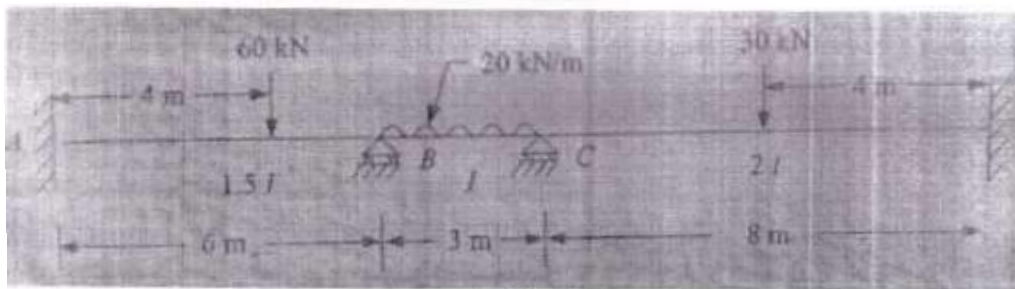


Fig.-4

- Q.7 a)** Determine the degree of static and kinematic indeterminacy of the frame as shown in Fig-5.

02

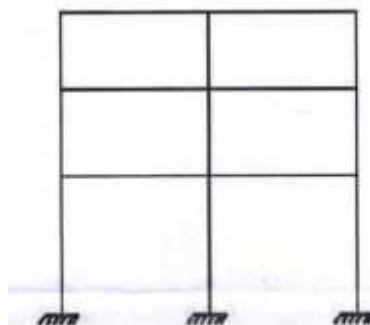


Fig.-5

- b) Analyze the continuous beam as shown in Fig. - 6 by flexibility matrix method.

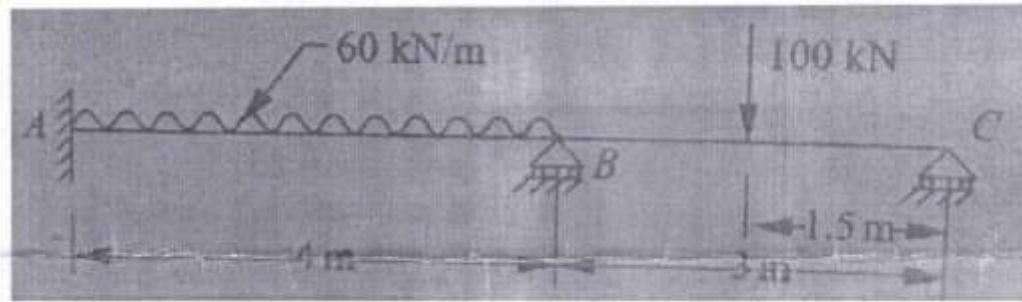


Fig.-6

- Q.8 Analyze the frame shown in Fig - 7 by stiffness matrix method and draw bending moment diagram.

09

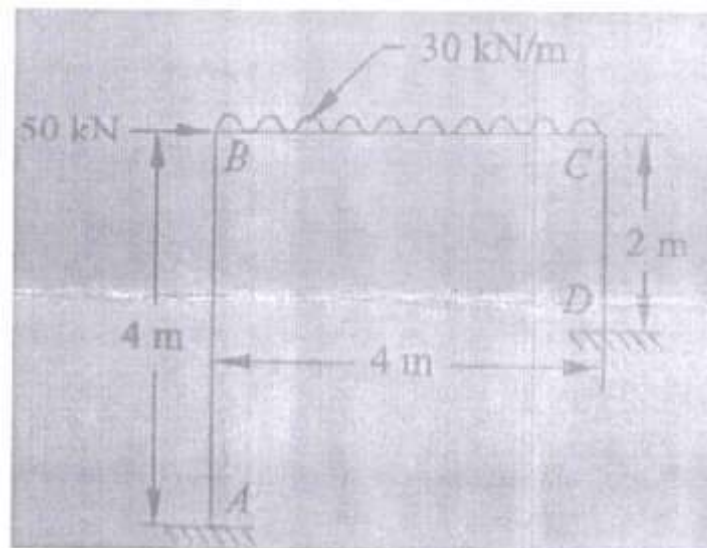


Fig.-7

- Q.9 Analyze the symmetric portal frame as shown in Fig. - 8 by moment distribution method and draw bending moment diagram.

09

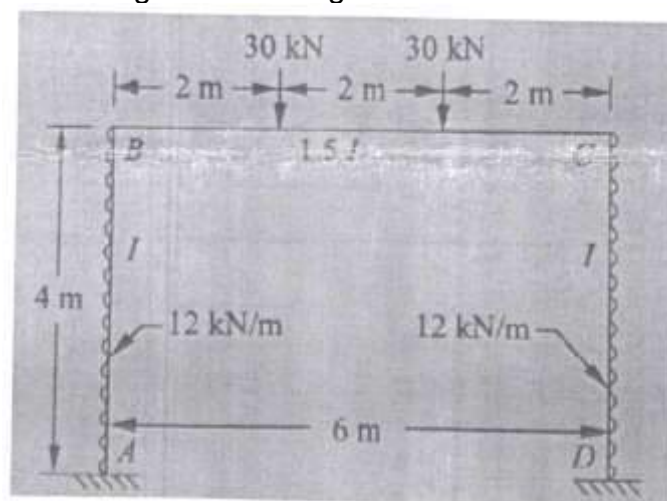


Fig.-8

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Day & Date: Friday, 10-03-2023  
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Marks: 14

14

- 1) A three hinged parabolic arch has a span of 30 m and the central rise is 5 m. It is subjected to a point load of 40 kN at a distance of 20 m from the right hinge. Calculate the vertical component at its left support \_\_\_\_\_.  
a) 35.35 kN                      b) 40 kN  
c) 13.13 kN                      d) 26.67 kN
- 2) The carryover factor in a prismatic member whose far end is fixed is \_\_\_\_\_.  
a) Zero                          b)  $\frac{1}{2}$   
c)  $\frac{3}{4}$                           d) One
- 3) Carryover Moment at end B due to moment M applied at end A for the given beam is \_\_\_\_\_.



- a) Zero  
c) -M
- b) +M  
d)  $+(M/2)$
- 4) For stable structures, one of the important properties of flexibility and stiffness matrices is that the elements on the main diagonal \_\_\_\_\_?
- i) of a stiffness matrix must be positive  
ii) of a stiffness matrix must be negative  
iii) of a flexibility matrix must be positive  
iv) of a flexibility matrix must be negative
- The correct answer is
- a) (i) and (iii)  
c) (i) and (iv)
- b) (ii) and (iii)  
d) (ii) and (iv)
- 5) The number of independent equations to be satisfied for static equilibrium of a plane structure is \_\_\_\_\_?
- a) 4  
c) 3
- b) 2  
d) 6

- 6) Flexibility matrix is also known as \_\_\_\_\_.  
 a) Displacement method                      b) Stiffness method  
 c) Equilibrium method                      d) Compatibility method
- 7) Independent displacement components at each joint of a rigid-jointed plane frame are \_\_\_\_\_.  
 a) Three linear movements  
 b) Two linear movements and one rotation  
 c) One linear movement and two rotations  
 d) Three rotations
- 8) If load is acting away from the longitudinal axis of column, it is called \_\_\_\_\_.  
 a) Horizontal load                      b) Axial load  
 c) Eccentric load                      d) Vertical load
- 9) The Rankine's constant ( $\alpha$ ) in Rankine's formula is equal to \_\_\_\_\_.  
 a)  $\Pi^2 \cdot E / \sigma_c$                       b)  $\Pi^2 / E \cdot \sigma_c$   
 c)  $E \cdot \sigma_c / \Pi^2$                       d)  $\sigma_c / \Pi^2 \cdot E$
- 10) Calculate the self-weight of rectangular dam of 22 m high and 8 m wide. It contains water up to a height of 20 m. consider the specific weight of masonry be 250 kN/m<sup>3</sup>.  
 a) 3560 kN                      b) 5432 kN  
 c) 4400 kN                      d) 5680 kN
- 11) An electric pole is 6.5 m high from the ground level. Its effective length for design purpose will be 3.25 m \_\_\_\_\_.  
 a) 6.5 m                      b) 3.25 m  
 c) 13.0 m                      d) 12.0 m
- 12) The ratio of crippling load, for a column of length (L) with both ends fixed to the crippling load of the same column with both ends hinges is equal to \_\_\_\_\_.  
 a) 2                      b) 4  
 c) 0.25                      d) 0.5
- 13) Deflection of a simply supported beam when subjected to central point load is given as \_\_\_\_\_.  
 a)  $WI / 16 EI$                       b)  $WI^2 / 16 EI$   
 c)  $WI^3 / 48 EI$                       d)  $5WI^4 / 384 EI$
- 14) Internal bending moment generated in a three hinged arch is always \_\_\_\_\_.  
 a) Zero  
 b) Infinite  
 c) Varies  
 d) Non zero value but remains constant

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Set **Q**

**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
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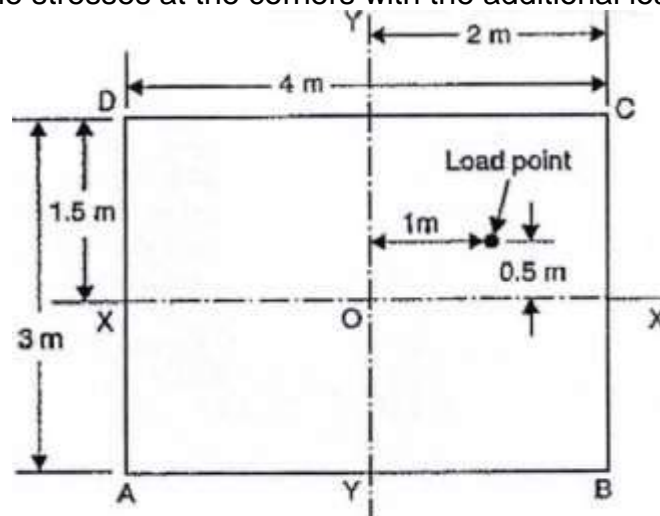


Fig.-1

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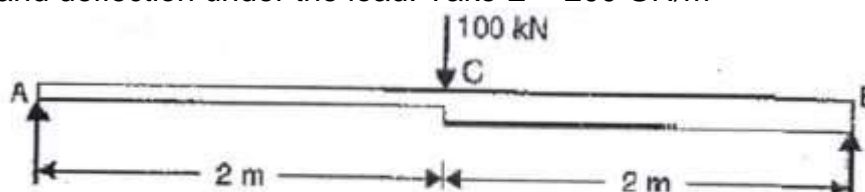


Fig.-2



- Q.4** A three hinged parabolic arch of span 40 m and rise 10 m carries a uniformly distributed load of 30 kN/m over left half span as shown in Fig.-3. Find horizontal thrust and support reaction.

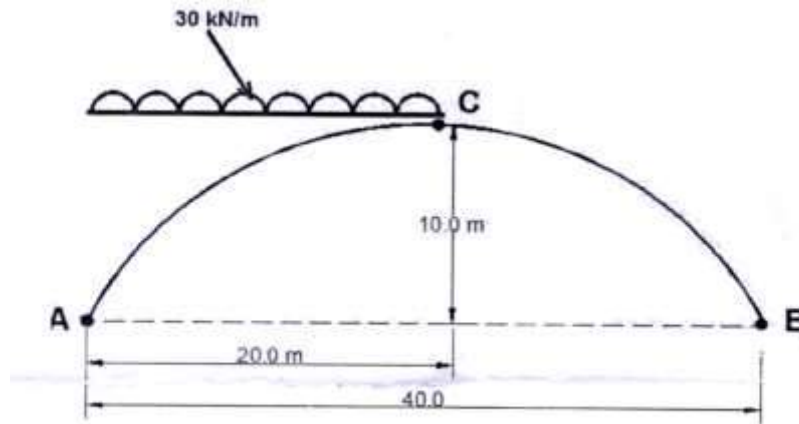


Fig.-3

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i) when the reservoir is full

Take the weight of masonry as  $19.62 \text{ kN/m}^3$ . Weight of water as  $9810 \text{ N/m}^3$ .

### Section – II

- Q.6** Analyze the continuous beam as shown in Fig.- 4 and draw bending moment diagram.

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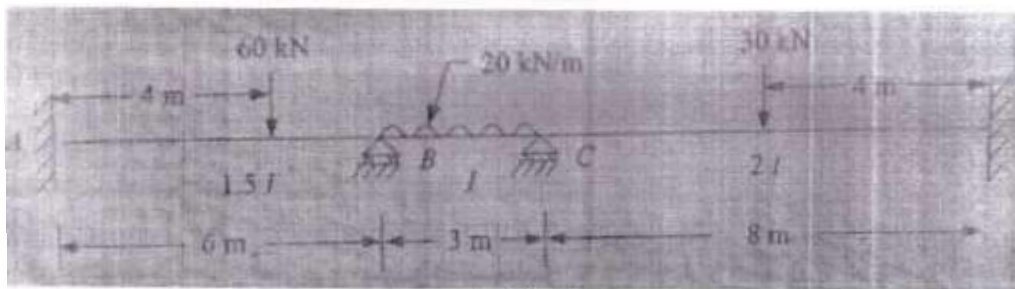


Fig.-4

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02



Fig.-5



- b) Analyze the continuous beam as shown in Fig. - 6 by flexibility matrix method.

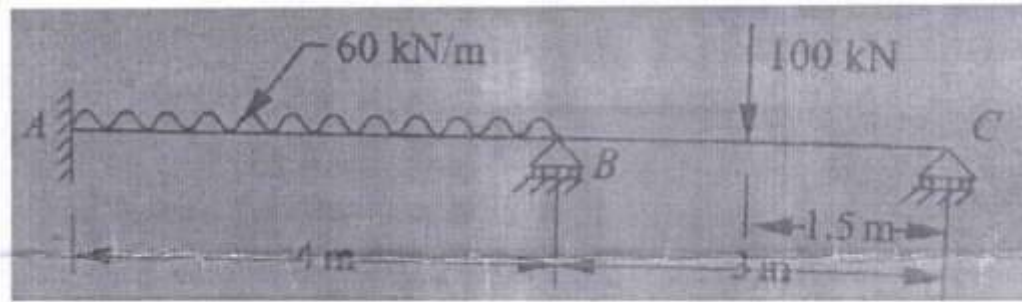


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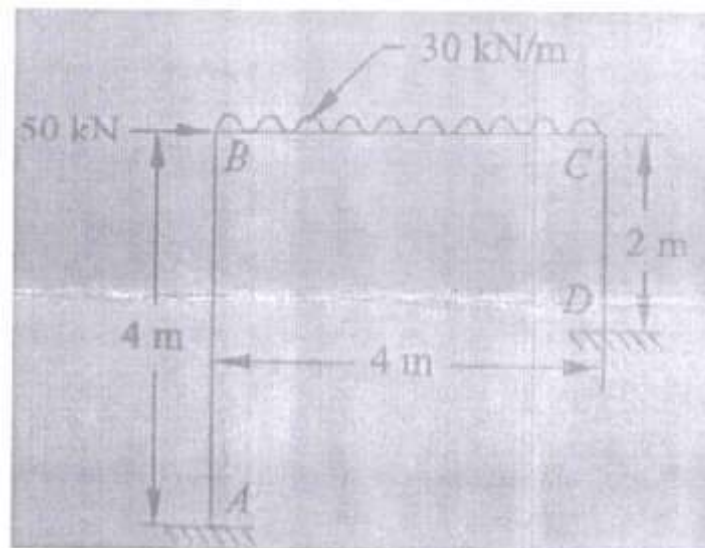


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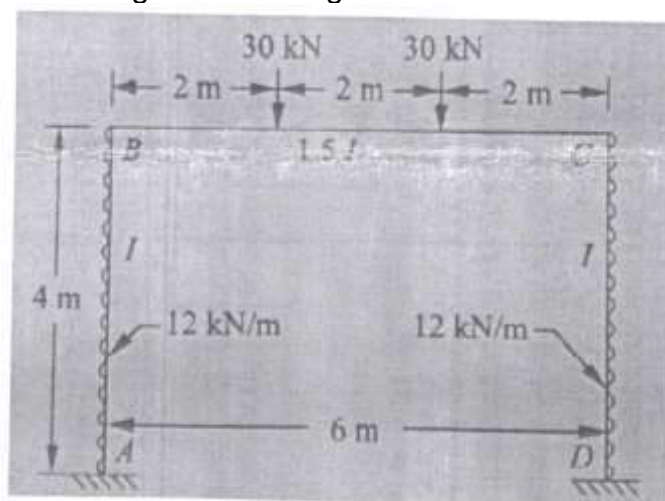


Fig.-8

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## Marks: 14

14

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- Page 12 of 20

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
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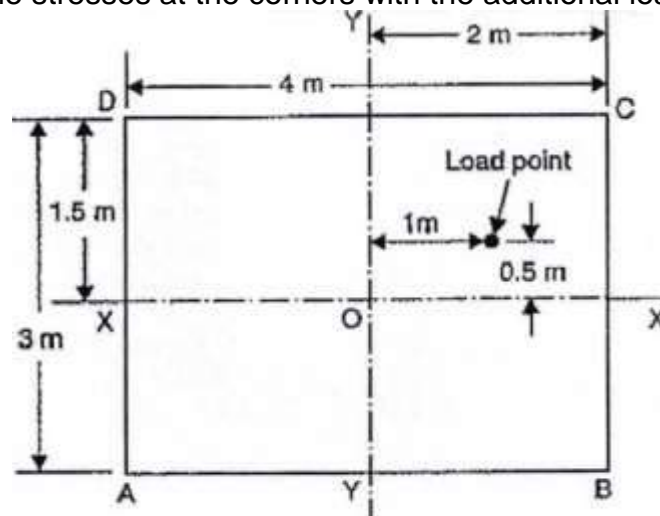


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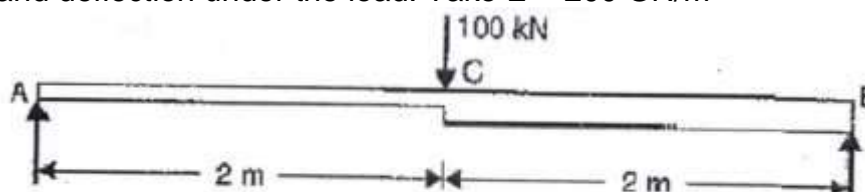


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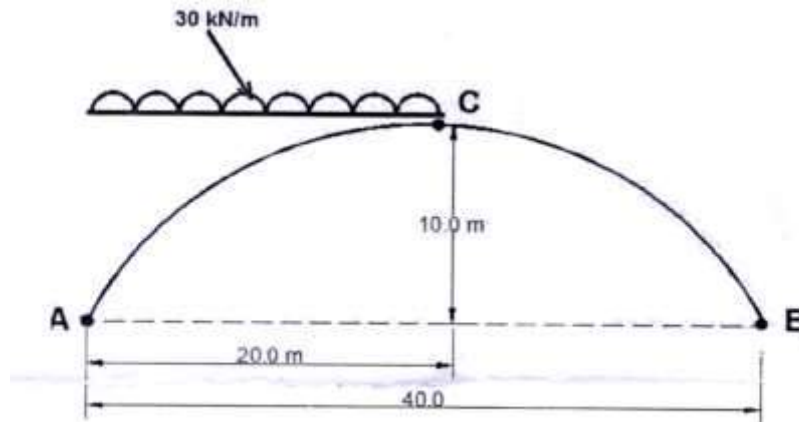


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10

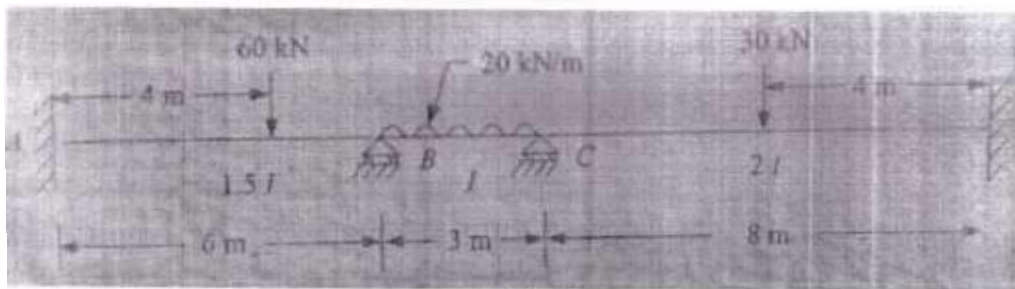


Fig.-4

- Q.7 a)** Determine the degree of static and kinematic indeterminacy of the frame as shown in Fig-5.

02



Fig.-5

- b) Analyze the continuous beam as shown in Fig. - 6 by flexibility matrix method.

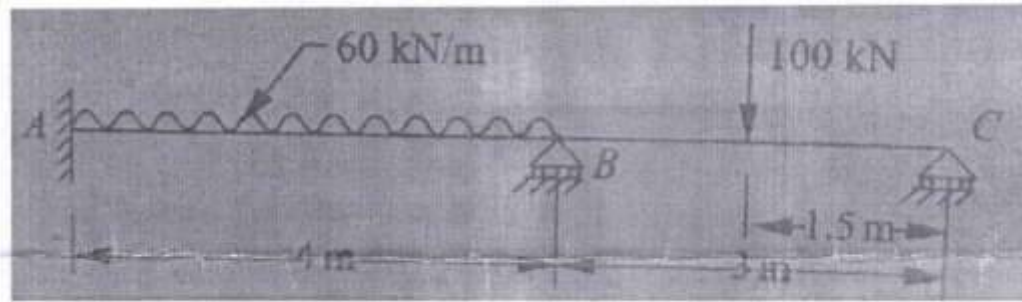


Fig.-6

- Q.8 Analyze the frame shown in Fig - 7 by stiffness matrix method and draw bending moment diagram.

09

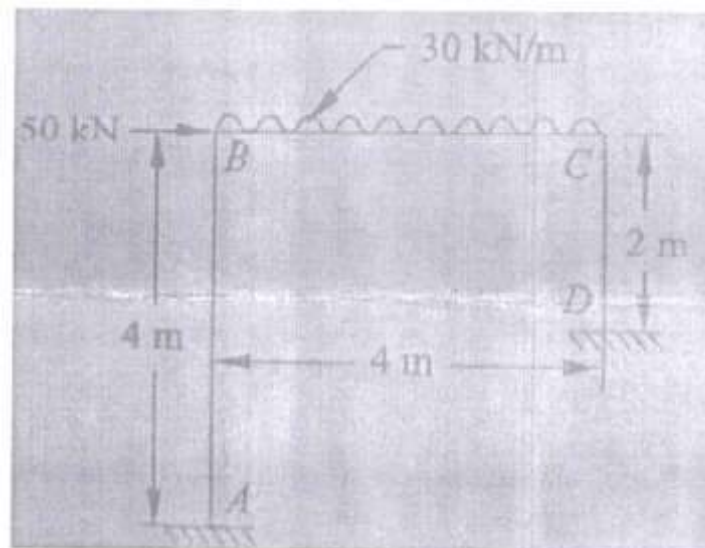


Fig.-7

- Q.9 Analyze the symmetric portal frame as shown in Fig. - 8 by moment distribution method and draw bending moment diagram.

09

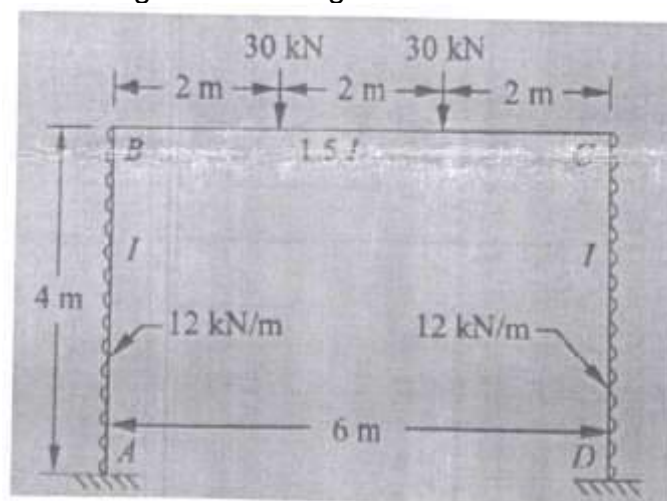


Fig.-8

**Seat  
No.**

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Deflection of a simply supported beam when subjected to central point load is given as \_\_\_\_\_.  
a)  $WI / 16 EI$   
b)  $WI^2 / 16 EI$   
c)  $WI^3 / 48 EI$   
d)  $5WI^4 / 384 EI$
- 2) Internal bending moment generated in a three hinged arch is always \_\_\_\_\_.  
a) Zero  
b) Infinite  
c) Varies  
d) Non zero value but remains constant
- 3) A three hinged parabolic arch has a span of 30 m and the central rise is 5 m. It is subjected to a point load of 40 kN at a distance of 20 m from the right hinge. Calculate the vertical component at its left support \_\_\_\_\_.  
a) 35.35 kN  
b) 40 kN  
c) 13.13 kN  
d) 26.67 kN
- 4) The carryover factor in a prismatic member whose far end is fixed is \_\_\_\_\_.  
a) Zero  
b)  $\frac{1}{2}$   
c)  $\frac{3}{4}$   
d) One
- 5) Carryover Moment at end B due to moment M applied at end A for the given beam is \_\_\_\_\_.



- a) Zero                      b) +M  
c) -M                        d) +(M/2)

- 6) For stable structures, one of the important properties of flexibility and stiffness matrices is that the elements on the main diagonal \_\_\_\_\_?
- of a stiffness matrix must be positive
  - of a stiffness matrix must be negative
  - of a flexibility matrix must be positive
  - of a flexibility matrix must be negative
- The correct answer is
- (i) and (iii)
  - (ii) and (iii)
  - (i) and (iv)
  - (ii) and (iv)
- 7) The number of independent equations to be satisfied for static equilibrium of a plane structure is \_\_\_\_\_?
- 4
  - 2
  - 3
  - 6
- 8) Flexibility matrix is also known as \_\_\_\_\_.
- Displacement method
  - Stiffness method
  - Equilibrium method
  - Compatibility method
- 9) Independent displacement components at each joint of a rigid-jointed plane frame are \_\_\_\_\_.
- Three linear movements
  - Two linear movements and one rotation
  - One linear movement and two rotations
  - Three rotations
- 10) If load is acting away from the longitudinal axis of column, it is called \_\_\_\_\_.
- Horizontal load
  - Axial load
  - Eccentric load
  - Vertical load
- 11) The Rankine's constant ( $\alpha$ ) in Rankine's formula is equal to \_\_\_\_\_.
- $\Pi^2 \cdot E / \sigma_c$
  - $\Pi^2 / E \cdot \sigma_c$
  - $E \cdot \sigma_c / \Pi^2$
  - $\sigma_c / \Pi^2 \cdot E$
- 12) Calculate the self-weight of rectangular dam of 22 m high and 8 m wide. It contains water up to a height of 20 m. consider the specific weight of masonry be 250 kN/m<sup>3</sup>.
- 3560 kN
  - 5432 kN
  - 4400 kN
  - 5680 kN
- 13) An electric pole is 6.5 m high from the ground level. Its effective length for design purpose will be 3.25 m \_\_\_\_\_.
- 6.5 m
  - 3.25 m
  - 13.0 m
  - 12.0 m
- 14) The ratio of crippling load, for a column of length (L) with both ends fixed to the crippling load of the same column with both ends hinges is equal to \_\_\_\_\_.
- 2
  - 4
  - 0.25
  - 0.5



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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Structural Analysis**

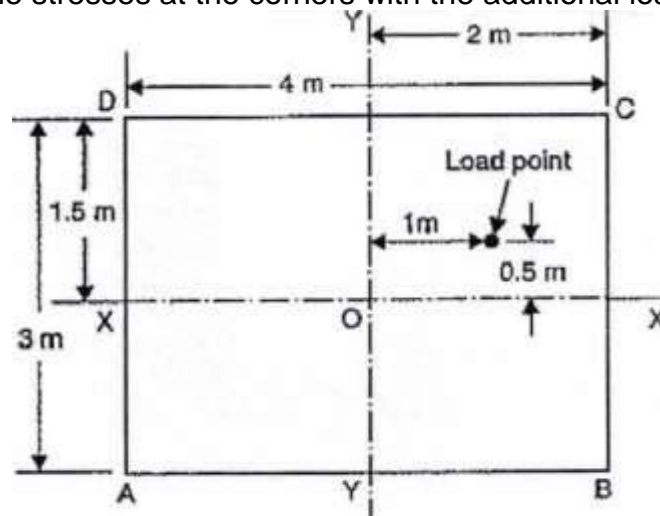
Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5.  
 2) Q. 6 is compulsory, attempt any two out of Q.7 to Q.9.  
 3) Figures to the right indicate full marks.  
 4) Use of scientific non programmable calculator is allowed  
 5) Assume suitable data if necessary and mention it clearly before solution  
 6) Draw the appropriate sketches wherever necessary.

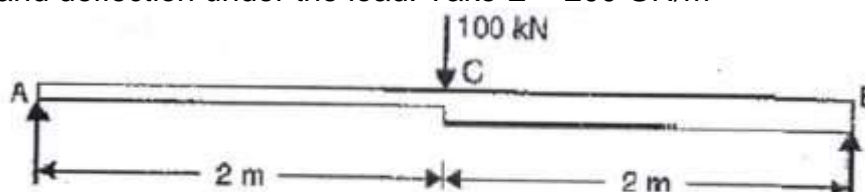
**Section – I**

- Q.2** A masonry pier of 3 m x 4 m supports a vertical load of 80 kN as shown in Fig. 1 **10**  
 a) find the stresses developed at each corner of the pier  
 b) what additional load should be placed at the center of the pier, so that there is no tension anywhere in the pier section  
 c) what are the stresses at the corners with the additional load in the center



**Fig.-1**

- Q.3** A simply supported beam AB of span 4 m as shown in Fig.-2., carries a point load of 100 kN at its center C. the value of 'I' for the left half is  $1 \times 10^8 \text{ mm}^4$  and for the right half portion 'I' is  $2 \times 10^8 \text{ mm}^4$ . Find the slopes at the two supports and deflection under the load. Take  $E = 200 \text{ GN/m}^2$  **09**



**Fig.-2**

- Q.4** A three hinged parabolic arch of span 40 m and rise 10 m carries a uniformly distributed load of 30 kN/m over left half span as shown in Fig.-3. Find horizontal thrust and support reaction.

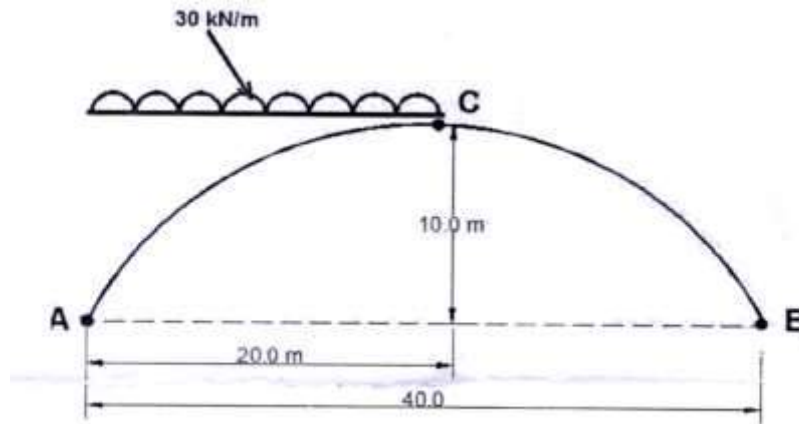


Fig.-3

- Q.5** A masonry trapezoidal dam 4 m high, 1 m wide at its top and 3 m width at its bottom retain water on its vertical face. Determine the maximum and minimum stresses at the base.

09

i) when the reservoir is full

Take the weight of masonry as  $19.62 \text{ kN/m}^3$ . Weight of water as  $9810 \text{ N/m}^3$ .

### Section – II

- Q.6** Analyze the continuous beam as shown in Fig.- 4 and draw bending moment diagram.

10

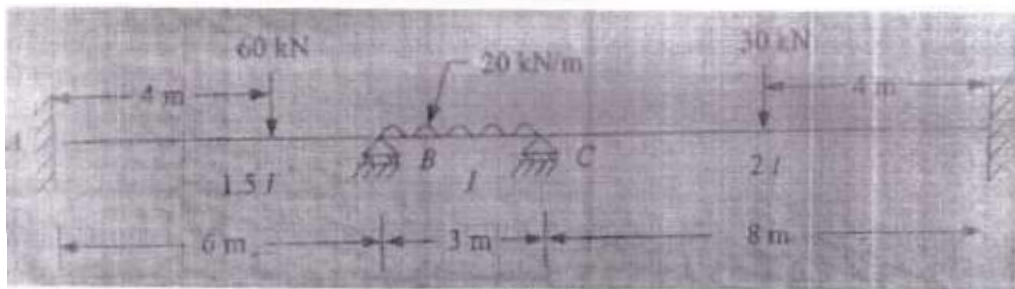


Fig.-4

- Q.7 a)** Determine the degree of static and kinematic indeterminacy of the frame as shown in Fig-5.

02



Fig.-5

- b) Analyze the continuous beam as shown in Fig. - 6 by flexibility matrix method.

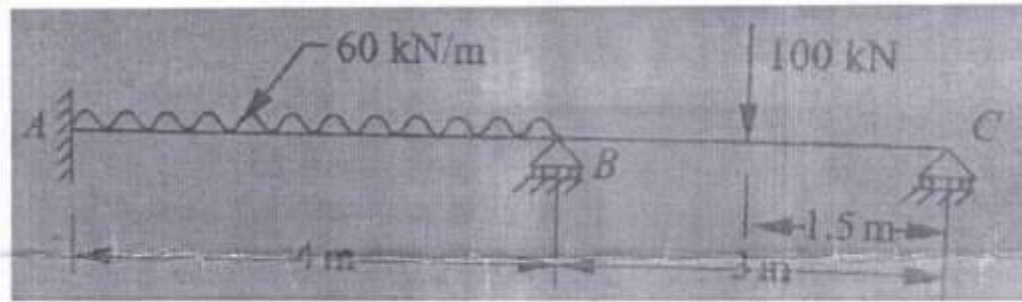


Fig.-6

- Q.8 Analyze the frame shown in Fig - 7 by stiffness matrix method and draw bending moment diagram.

09

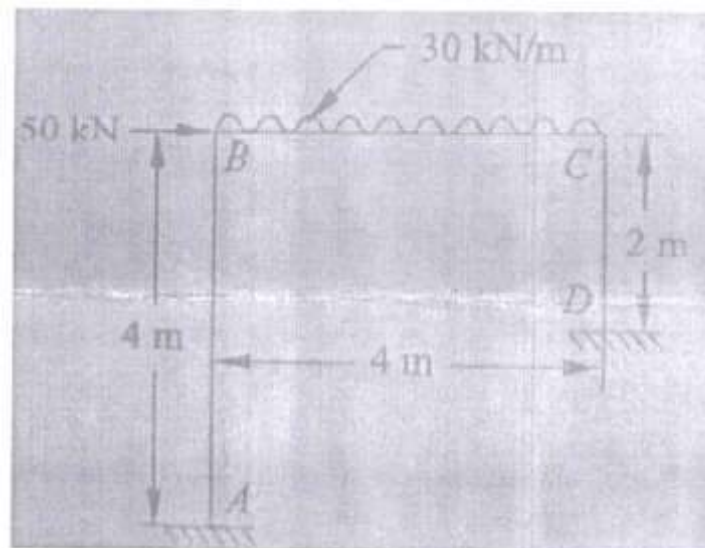


Fig.-7

- Q.9 Analyze the symmetric portal frame as shown in Fig. - 8 by moment distribution method and draw bending moment diagram.

09

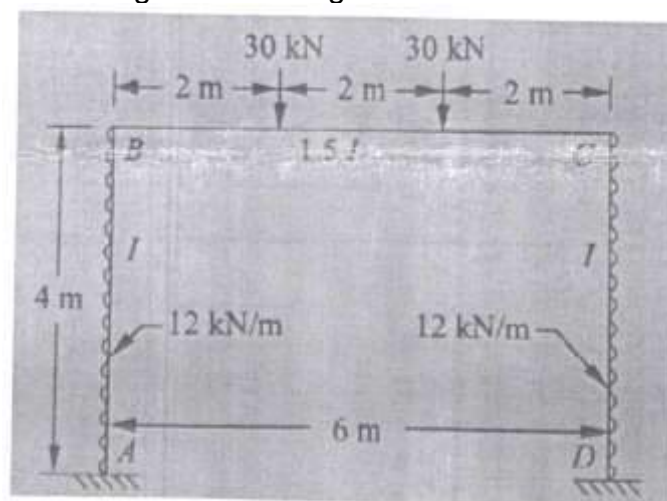


Fig.-8

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Set **P**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If the linear differential equation with constant coefficient has real root 'm' repeated twice, then the corresponding complementary functions \_\_\_\_\_.  
 a)  $c_1 e^{mx} + c_2 e^{-mx}$                       b)  $c_1 \cos(mx) + c_2 \sin(mx)$   
 c)  $(c_1 + c_2 x) e^{mx}$                       d)  $(c_1 + c_2 x) e^{-mx}$
- 2)  $\frac{1}{D^2} \{x^3\}$  is equal to \_\_\_\_\_.  
 a)  $\frac{x^5}{20}$                       b)  $\frac{x^4}{12}$   
 c)  $x^3 e^{-x}$                       d)  $20 x^5$
- 3) The particular integral of  $(D^2 + a^2)y = \cos(ax)$  is \_\_\_\_\_.  
 a)  $\frac{x}{2a} \cos(ax)$                       b)  $\frac{x}{2a^2} \cos(ax)$   
 c)  $\frac{x}{2a} \sin(ax)$                       d)  $\frac{x}{2a^2} \sin(ax)$
- 4) The solution of partial differential equation  $q = 3p^2$  is \_\_\_\_\_.  
 a)  $z = ax + \frac{a^2}{3} y + c$                       b)  $z = 3ax + a^2 y + c$   
 c)  $z = 3a^2 x + by$                       d)  $z = ax + 3a^2 y + c$
- 5) The general solution of partial differential equation  $pe^y = qe^x$  is \_\_\_\_\_.  
 a)  $z = a(e^{-x} + e^{-y}) + c$                       b)  $z = a(e^{-x} - e^{-y}) + c$   
 c)  $z = a(e^x + e^y) + c$                       d)  $z = a(e^x - e^y) + c$
- 6) In the interval,  $(0, \pi)$ , the constant term in the Fourier half range cosine series of  $f(x) = x$  is \_\_\_\_\_.  
 a)  $\pi$                       b)  $\frac{\pi}{2}$   
 c)  $0$                       d)  $\frac{\pi}{4}$
- 7) The Fourier expansion of an even function  $f(x)$  in  $(-5, 5)$  has only \_\_\_\_\_.  
 a) Cosine terms                      b) Sine terms  
 c) Both Sine & Cosine terms                      d) None of these

- Page 2 of 16

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three from the following.** **09**

- Solve :  $(D^2 + 1)y = 3 + 5e^{-3x}$
- Solve :  $(D^3 - 4D)y = \cos(x)$
- Solve :  $p(1 + q) = qz$
- Solve :  $x^2p^2 + y^2q^2 = qz$
- Obtain the Fourier series of  $f(x) = 1 - x^2$  in  $-1 \leq x \leq 1$

**Q.3 Attempt any three from the followings.** **09**

- Solve :  $(D^2 + 4)y = x \cos x$
- Solve :  $py = 2xy + \log q$
- Solve :  $y^4z p + zx^4q = xy^4$
- Obtain the half range sine series of the function  $f(x) = \pi x - x^2$  in  $(0, \pi)$
- Solve :  $(D^2 + 6D + 9)y = e^{-3x} \cos 2(x)$

**Q.4 Attempt any two from the following.** **10**

- Solve the partial differential equation by method of separation of variables  
 $\frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = z$  where  $z(x, 0) = 6e^{-3x}$
- Obtain the Fourier series of the function series of the function  
 $f(x) = \frac{1}{4}(\pi - x)^2$   $0 \leq x \leq 2\pi$
- The equation of motion of a spring whose one and other end supports weight of 10 lbs is given by equation  $\frac{d^2x}{dt^2} + \frac{8}{25} \frac{dx}{dt} + 64x = 0$ .  
 If at  $t = 0$ ,  $x = 0.25$  and  $\frac{dx}{dt} = 0$ , then find the displacement ' $x$ ' at any time ' $t$ '

**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Find  $L\{e^{-3t}t \sin 4t\}$
- Find  $L^{-1}\left\{\frac{s}{(s-2)(s+3)}\right\}$
- Compute the coefficient of correlation between  $x$  and  $y$  from the data  
 $N = 20, \sum x = 80, \sum x^2 = 900, \sum y = 70, \sum y^2 = 800$  and  $\sum xy = 700$
- Evaluate  $\int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's 1/3<sup>rd</sup> rule with  $h = 0.25$

- e) Find a positive real root of the equation  $2x - 3 \sin x - 5 = 0$  correct to three decimal places by Regula Falsi method.

**Q.6 Attempt any three from the following.****09**

- a) The probability that a missile will strike the target is  $\frac{1}{5}$ . If six missiles are fixed, then using Binomial distribution find the probability that exactly two will strike the target.
- b) If the probability an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution determine the probability that out of 2000 individuals
- exactly 3,
  - at most 2 will suffer a bad reaction
- c) Find  $L^{-1}\left\{\frac{1}{s(s^2+9)}\right\}$  by convolution theorem.
- d) Find a positive real root of the equation  $xe^x - 2 = 0$  correct to three decimal places by Newton's Raphson method.
- e) Find the Laplace transform of  $t \sin 2t \cos 3t$

**Q.7 Attempt any two from the following.****10**

- a) Evaluate  $\int_0^{\infty} e^{-3t} t \sin t \, dt$  by Laplace transform
- b) Evaluate  $\int_0^{\pi} \frac{\sin x}{x} \, dx$  by dividing range into six equals parts, using Trapezoidal rule and Weddle's rule.
- c) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cm. How many hats in a total of 2000 will have sizes between
- 18 cm and 20 cm
  - Above 20 cm?
- (Give: For S. N. V. z, area between  $z = 0$  and  $z = 0.6$  is 0.2257, between  $z = 0$  and  $z = 0.2$  is 0.0793)

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If  $L\{f(t) = F(s)\}$ , then  $L\{tf(t)\} = \underline{\hspace{2cm}}$ .
 

|                            |                           |
|----------------------------|---------------------------|
| a) $\frac{d}{ds}\{F(s)\}$  | b) $\frac{1}{s} F(s)$     |
| c) $-\frac{d}{ds}\{F(s)\}$ | d) $\int_s^\infty F(s)ds$ |
- 2)  $L\left\{\int_0^t \cos h(t)dt\right\} = \underline{\hspace{2cm}}$ 

|                              |                        |
|------------------------------|------------------------|
| a) $\frac{s}{s^2 - 1}$       | b) $\frac{s}{s^2 + 1}$ |
| c) $-\frac{2s}{(s^2 - 1)^2}$ | d) $\frac{1}{s^2 - 1}$ |
- 3) In solving algebraic and transcendental equations, the rate convergence of Newton's Raphson method is \_\_\_\_\_.
 

|        |         |
|--------|---------|
| a) 0.5 | b) 2    |
| c) 1.5 | d) 1.62 |
- 4) The number of strips required to use Weddle's rule is \_\_\_\_\_.
 

|                  |                  |
|------------------|------------------|
| a) Multiple of 6 | b) Multiple of 3 |
| c) Multiple of 2 | d) Any number    |
- 5) The order of error is Simpson's  $\frac{1}{3}$  rd rule is \_\_\_\_\_.
 

|          |          |
|----------|----------|
| a) $h^3$ | b) $h^2$ |
| c) $h^4$ | d) $h^6$ |
- 6) A continuous random variable has the probability density function  $f(x) = kx^2$ , for  $0 \leq x \leq 2$  then  $k = \underline{\hspace{2cm}}$ .
 

|                  |                  |
|------------------|------------------|
| a) $\frac{8}{3}$ | b) $\frac{3}{2}$ |
| c) $\frac{5}{8}$ | d) $\frac{3}{8}$ |



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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three from the following. 09**

- Solve :  $(D^2 + 1)y = 3 + 5e^{-3x}$
- Solve :  $(D^3 - 4D)y = \cos(x)$
- Solve :  $p(1 + q) = qz$
- Solve :  $x^2p^2 + y^2q^2 = qz$
- Obtain the Fourier series of  $f(x) = 1 - x^2$  in  $-1 \leq x \leq 1$

**Q.3 Attempt any three from the followings. 09**

- Solve :  $(D^2 + 4)y = x \cos x$
- Solve :  $py = 2xy + \log q$
- Solve :  $y^4z p + zx^4q = xy^4$
- Obtain the half range sine series of the function  $f(x) = \pi x - x^2$  in  $(0, \pi)$
- Solve :  $(D^2 + 6D + 9)y = e^{-3x} \cos 2(x)$

**Q.4 Attempt any two from the following. 10**

- Solve the partial differential equation by method of separation of variables  
 $\frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = z$  where  $z(x, 0) = 6e^{-3x}$
- Obtain the Fourier series of the function series of the function  
 $f(x) = \frac{1}{4}(\pi - x)^2$   $0 \leq x \leq 2\pi$
- The equation of motion of a spring whose one and other end supports weight of 10 lbs is given by equation  $\frac{d^2x}{dt^2} + \frac{8}{25} \frac{dx}{dt} + 64x = 0$ .  
 If at  $t = 0$ ,  $x = 0.25$  and  $\frac{dx}{dt} = 0$ , then find the displacement ' $x$ ' at any time ' $t$ '

**Section – II**

**Q.5 Attempt any three of the following. 09**

- Find  $L\{e^{-3t}t \sin 4t\}$
- Find  $L^{-1}\left\{\frac{s}{(s-2)(s+3)}\right\}$
- Compute the coefficient of correlation between  $x$  and  $y$  from the data  
 $N = 20, \sum x = 80, \sum x^2 = 900, \sum y = 70, \sum y^2 = 800$  and  $\sum xy = 700$
- Evaluate  $\int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's 1/3<sup>rd</sup> rule with  $h = 0.25$

- e) Find a positive real root of the equation  $2x - 3 \sin x - 5 = 0$  correct to three decimal places by Regula Falsi method.

**Q.6 Attempt any three from the following.****09**

- a) The probability that a missile will strike the target is  $\frac{1}{5}$ . If six missiles are fixed, then using Binomial distribution find the probability that exactly two will strike the target.
- b) If the probability an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution determine the probability that out of 2000 individuals
- exactly 3,
  - at most 2 will suffer a bad reaction
- c) Find  $L^{-1}\left\{\frac{1}{s(s^2+9)}\right\}$  by convolution theorem.
- d) Find a positive real root of the equation  $xe^x - 2 = 0$  correct to three decimal places by Newton's Raphson method.
- e) Find the Laplace transform of  $t \sin 2t \cos 3t$

**Q.7 Attempt any two from the following.****10**

- a) Evaluate  $\int_0^{\infty} e^{-3t} t \sin t \, dt$  by Laplace transform
- b) Evaluate  $\int_0^{\pi} \frac{\sin x}{x} \, dx$  by dividing range into six equals parts, using Trapezoidal rule and Weddle's rule.
- c) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cm. How many hats in a total of 2000 will have sizes between
- 18 cm and 20 cm
  - Above 20 cm?
- (Give: For S. N. V. z, area between  $z = 0$  and  $z = 0.6$  is 0.2257, between  $z = 0$  and  $z = 0.2$  is 0.0793)

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 9 of 16

- Page 10 of 16

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Set **R**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three from the following.** **09**

- Solve :  $(D^2 + 1)y = 3 + 5e^{-3x}$
- Solve :  $(D^3 - 4D)y = \cos(x)$
- Solve :  $p(1 + q) = qz$
- Solve :  $x^2p^2 + y^2q^2 = qz$
- Obtain the Fourier series of  $f(x) = 1 - x^2$  in  $-1 \leq x \leq 1$

**Q.3 Attempt any three from the followings.** **09**

- Solve :  $(D^2 + 4)y = x \cos x$
- Solve :  $py = 2xy + \log q$
- Solve :  $y^4z p + zx^4q = xy^4$
- Obtain the half range sine series of the function  $f(x) = \pi x - x^2$  in  $(0, \pi)$
- Solve :  $(D^2 + 6D + 9)y = e^{-3x} \cos 2(x)$

**Q.4 Attempt any two from the following.** **10**

- Solve the partial differential equation by method of separation of variables  
 $\frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = z$  where  $z(x, 0) = 6e^{-3x}$
- Obtain the Fourier series of the function series of the function  
 $f(x) = \frac{1}{4}(\pi - x)^2$   $0 \leq x \leq 2\pi$
- The equation of motion of a spring whose one and other end supports weight of 10 lbs is given by equation  $\frac{d^2x}{dt^2} + \frac{8}{25} \frac{dx}{dt} + 64x = 0$ .  
 If at  $t = 0$ ,  $x = 0.25$  and  $\frac{dx}{dt} = 0$ , then find the displacement ' $x$ ' at any time ' $t$ '

**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Find  $L\{e^{-3t}t \sin 4t\}$
- Find  $L^{-1}\left\{\frac{s}{(s-2)(s+3)}\right\}$
- Compute the coefficient of correlation between  $x$  and  $y$  from the data  
 $N = 20, \sum x = 80, \sum x^2 = 900, \sum y = 70, \sum y^2 = 800$  and  $\sum xy = 700$
- Evaluate  $\int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's 1/3<sup>rd</sup> rule with  $h = 0.25$

- e) Find a positive real root of the equation  $2x - 3 \sin x - 5 = 0$  correct to three decimal places by Regula Falsi method.

**Q.6 Attempt any three from the following.****09**

- a) The probability that a missile will strike the target is  $\frac{1}{5}$ . If six missiles are fixed, then using Binomial distribution find the probability that exactly two will strike the target.
- b) If the probability an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution determine the probability that out of 2000 individuals
- exactly 3,
  - at most 2 will suffer a bad reaction
- c) Find  $L^{-1}\left\{\frac{1}{s(s^2+9)}\right\}$  by convolution theorem.
- d) Find a positive real root of the equation  $xe^x - 2 = 0$  correct to three decimal places by Newton's Raphson method.
- e) Find the Laplace transform of  $t \sin 2t \cos 3t$

**Q.7 Attempt any two from the following.****10**

- a) Evaluate  $\int_0^{\infty} e^{-3t} t \sin t \, dt$  by Laplace transform
- b) Evaluate  $\int_0^{\pi} \frac{\sin x}{x} \, dx$  by dividing range into six equals parts, using Trapezoidal rule and Weddle's rule.
- c) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cm. How many hats in a total of 2000 will have sizes between
- 18 cm and 20 cm
  - Above 20 cm?
- (Give: For S. N. V. z, area between  $z = 0$  and  $z = 0.6$  is 0.2257, between  $z = 0$  and  $z = 0.2$  is 0.0793)

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 13 of 16



- Page 14 of 16

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Set **S**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**CIVIL ENGINEERING**  
**Engineering Mathematics-III**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three from the following.** **09**

- Solve :  $(D^2 + 1)y = 3 + 5e^{-3x}$
- Solve :  $(D^3 - 4D)y = \cos(x)$
- Solve :  $p(1 + q) = qz$
- Solve :  $x^2p^2 + y^2q^2 = qz$
- Obtain the Fourier series of  $f(x) = 1 - x^2$  in  $-1 \leq x \leq 1$

**Q.3 Attempt any three from the followings.** **09**

- Solve :  $(D^2 + 4)y = x \cos x$
- Solve :  $py = 2xy + \log q$
- Solve :  $y^4z p + zx^4q = xy^4$
- Obtain the half range sine series of the function  $f(x) = \pi x - x^2$  in  $(0, \pi)$
- Solve :  $(D^2 + 6D + 9)y = e^{-3x} \cos 2(x)$

**Q.4 Attempt any two from the following.** **10**

- Solve the partial differential equation by method of separation of variables  
 $\frac{\partial z}{\partial x} - 2 \frac{\partial z}{\partial y} = z$  where  $z(x, 0) = 6e^{-3x}$
- Obtain the Fourier series of the function series of the function  
 $f(x) = \frac{1}{4}(\pi - x)^2$   $0 \leq x \leq 2\pi$
- The equation of motion of a spring whose one and other end supports weight of 10 lbs is given by equation  $\frac{d^2x}{dt^2} + \frac{8}{25} \frac{dx}{dt} + 64x = 0$ .  
 If at  $t = 0$ ,  $x = 0.25$  and  $\frac{dx}{dt} = 0$ , then find the displacement ' $x$ ' at any time ' $t$ '

**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Find  $L\{e^{-3t}t \sin 4t\}$
- Find  $L^{-1}\left\{\frac{s}{(s-2)(s+3)}\right\}$
- Compute the coefficient of correlation between  $x$  and  $y$  from the data  
 $N = 20, \sum x = 80, \sum x^2 = 900, \sum y = 70, \sum y^2 = 800$  and  $\sum xy = 700$
- Evaluate  $\int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's 1/3<sup>rd</sup> rule with  $h = 0.25$

- e) Find a positive real root of the equation  $2x - 3 \sin x - 5 = 0$  correct to three decimal places by Regula Falsi method.

**Q.6 Attempt any three from the following.****09**

- a) The probability that a missile will strike the target is  $\frac{1}{5}$ . If six missiles are fixed, then using Binomial distribution find the probability that exactly two will strike the target.
- b) If the probability an individual suffers a bad reaction from a certain injection is 0.001. Using Poisson distribution determine the probability that out of 2000 individuals
- exactly 3,
  - at most 2 will suffer a bad reaction
- c) Find  $L^{-1}\left\{\frac{1}{s(s^2+9)}\right\}$  by convolution theorem.
- d) Find a positive real root of the equation  $xe^x - 2 = 0$  correct to three decimal places by Newton's Raphson method.
- e) Find the Laplace transform of  $t \sin 2t \cos 3t$

**Q.7 Attempt any two from the following.****10**

- a) Evaluate  $\int_0^{\infty} e^{-3t} t \sin t \, dt$  by Laplace transform
- b) Evaluate  $\int_0^{\pi} \frac{\sin x}{x} \, dx$  by dividing range into six equals parts, using Trapezoidal rule and Weddle's rule.
- c) The size of hats is normally distributed with mean 18.5 cm and standard deviation 2.5 cm. How many hats in a total of 2000 will have sizes between
- 18 cm and 20 cm
  - Above 20 cm?
- (Give: For S. N. V. z, area between  $z = 0$  and  $z = 0.6$  is 0.2257, between  $z = 0$  and  $z = 0.2$  is 0.0793)

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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Applied Thermodynamics**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks  
 4) Use of Steam table and scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Rankin cycle comprises of \_\_\_\_\_  
 a) Two isentropic and two constant volume processes  
 b) Two isentropic and two constant pressure processes  
 c) Two isothermal and two isentropic  
 d) None of these
- 2) Volumetric efficiency is always \_\_\_\_\_  
 a) Less than 1  
 b) equal to 1  
 c) Greater than 1  
 d) In between 1 & 5
- 3) The term coefficient of performance (COP) is related with \_\_\_\_\_  
 a) Heat Pump  
 b) Heat Engine  
 c) Steam Engine  
 d) Gas Turbine
- 4) If pressure on water increases then saturation temperature \_\_\_\_\_  
 a) remains constant  
 b) decreases  
 c) increases remain constant  
 d) none of these
- 5) Which of among the following is the boiler mounting?  
 a) Air preheater  
 b) Economizer  
 c) Fusible plug  
 d) Super heater
- 6) In Rankine cycle, the work output from turbine is obtained by \_\_\_\_\_  
 a) Change in internal energy between inlet and outlet  
 b) Change in enthalpy between inlet and outlet  
 c) Change in entropy between inlet and outlet  
 d) Change in temperature between inlet and outlet
- 7) Latent heat of vaporization of water at critical point is \_\_\_\_\_.  
 a) Zero  
 b) 539 kcal/kg  
 c) 1 kcal/kg  
 d) 2257 KJ/Kg
- 8) The steam leaves the nozzle at \_\_\_\_\_.  
 a) High pressure and low velocity  
 b) Low pressure and low velocity  
 c) High pressure and high velocity  
 d) Low pressure and high velocity



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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Applied Thermodynamics**

Day &amp; Date: Monday, 13-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume additional suitable data if necessary and state it clearly.  
 4) Use of Steam and scientific calculator is allowed.

**Section – I**

- Q.2** a) Explain the effect of operating conditions on the efficiency of Rankine cycle. **05**  
 b) Calculate the standard enthalpy change at 298.15K for the reaction **05**  

$$\text{C}_5\text{H}_{12(g)} + 8\text{O}_2 \longrightarrow 5\text{CO}_{2(g)} + 6\text{H}_2\text{O}_g$$
  
 Standard enthalpy of formation at 298.15K for  
 $\text{CO}_{2(g)} = -393.8 \text{ KJ/mol}$   
 $\text{H}_2\text{O}_{(g)} = -242 \text{ KJ/mol}$   
 $\text{C}_5\text{H}_{12(g)} = -146.5 \text{ KJ/mol}$   
 c) Explain the different heat losses in boiler and draw model heat balance sheet for boiler. **04**
- Q.3** a) A steam power plant working on Rankine cycle has range of operations 50 bar to 0.08 bar. **06**  
 The steam at the entry of turbine is dry saturated.  
 Calculate -  
 i) Dryness fraction at the end of expansion  
 ii) Turbine work  
 iii) Cycle Efficiency  
 b) Explain - Equivalent evaporation and Boiler efficiency **04**  
 c) Compare heat engine and heat pump. **04**
- Q.4** a) The following readings were obtained during a boiler trial of 6 hours duration. **05**  
 Mean steam pressure 12 bar, mass of steam generated 40000Kg, mean dryness fraction as 0.80. Mean feed water temperature 30°C, coal used 4000 Kg, Calorific value of coal is 33600 KJ/Kg.  
 Calculate –  
 i) Equivalent evaporation  
 ii) Boiler efficiency  
 b) Explain the Rankine cycle with neat diagram. **05**  
 c) Explain with the help of property diagram, phase change process of water. **04**

**Section – II**

- Q.5**   **a)** In a De-Laval turbine steam issues from a nozzle with a velocity of 1200m/s. **05**  
The nozzle angle is  $20^\circ$ . The mean blade speed is 400 m/s, inlet and outlet angles are equal. The mass of steam flowing through the turbine per hour is 1000kg,  
Calculate:  
i) Blade angles  
ii) Relative velocity of blade entering the blade  
iii) Blade efficiency
- b)** Explain with neat sketch any one type surface condenser. **05**
- c)** What is nozzle? Explain the types of nozzle with neat sketches **04**
- Q.6**   **a)** Derive an expression for intermediate pressure for a two stage compressor with minimum work input. **05**
- b)** A Compressor compresses air from 1 bar to 7 bar. The clearance volume is 2.13 lit. Compression and expansion are polytropic with  $n=1.3$ , volumetric efficiency is 85%. **05**  
Determine:  
i) Stroke volume  
ii) Diameter of cylinder if length of stroke is 30 cm.
- c)** Explain the classification of steam turbines. **04**
- Q.7**   **a)** What is mean by compounding of steam turbine? What are its different methods? Explain any one method with neat diagram. **05**
- b)** Derive an expression for work done equation of compressor with and without clearance **05**
- c)** Write the difference between jet and surface condenser. **04**

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Set **Q**

**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Applied Thermodynamics**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks  
 4) Use of Steam table and scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The steam leaves the nozzle at \_\_\_\_\_.  
 a) High pressure and low velocity  
 b) Low pressure and low velocity  
 c) High pressure and high velocity  
 d) Low pressure and high velocity
- 2) In intercooler the pressure of the compresses air \_\_\_\_\_.  
 a) Reduces  
 b) Increases  
 c) Remains same  
 d) None of these
- 3) For Parson's reaction steam turbine, the degree of reaction is \_\_\_\_\_.  
 a) 70%  
 b) 100%  
 c) 25%  
 d) 50%
- 4) Dryness fraction (x) of superheated steam is \_\_\_\_\_.  
 a) Less than 1  
 b) Greater than 1  
 c) Equals to 1  
 d) None of these
- 5) Standard Enthalpy of formation is measured at \_\_\_\_\_.  
 a) 25° C and 10 atm  
 b) 0° C and 1 atm  
 c) 100° C and 1 atm  
 d) 25° C and 1 atm
- 6) Compounding of steam turbine is done to \_\_\_\_\_.  
 a) To balance the rotor  
 b) Reduce the blade friction  
 c) Reduce the rotor speed  
 d) To increase the rotor speed
- 7) Evaporative type of condenser has \_\_\_\_\_.  
 a) Steam in pipe surrounded by water  
 b) water in pipe surrounded by steam  
 c) Either a and b  
 d) None of these



- 8) Rankin cycle comprises of \_\_\_\_\_  
a) Two isentropic and two constant volume processes  
b) Two isentropic and two constant pressure processes  
c) Two isothermal and two isentropic  
d) None of these
- 9) Volumetric efficiency is always \_\_\_\_\_  
a) Less than 1  
b) equal to 1  
c) Greater than 1  
d) In between 1 & 5
- 10) The term coefficient of performance (COP) is related with \_\_\_\_\_  
a) Heat Pump  
b) Heat Engine  
c) Steam Engine  
d) Gas Turbine
- 11) If pressure on water increases then saturation temperature \_\_\_\_\_  
a) remains constant  
b) decreases  
c) increases remain constant  
d) none of these
- 12) Which of among the following is the boiler mounting?  
a) Air preheater  
b) Economizer  
c) Fusible plug  
d) Super heater
- 13) In Rankine cycle, the work output from turbine is obtained by \_\_\_\_\_  
a) Change in internal energy between inlet and outlet  
b) Change in enthalpy between inlet and outlet  
c) Change in entropy between inlet and outlet  
d) Change in temperature between inlet and outlet
- 14) Latent heat of vaporization of water at critical point is \_\_\_\_\_.  
a) Zero  
b) 539 kcal/kg  
c) 1 kcal/kg  
d) 2257 KJ/Kg

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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Applied Thermodynamics**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume additional suitable data if necessary and state it clearly.  
 4) Use of Steam and scientific calculator is allowed.

**Section – I**

- Q.2** a) Explain the effect of operating conditions on the efficiency of Rankine cycle. **05**  
 b) Calculate the standard enthalpy change at 298.15K for the reaction **05**  

$$\text{C}_5\text{H}_{12(g)} + 8\text{O}_2 \longrightarrow 5\text{CO}_{2(g)} + 6\text{H}_2\text{O}_g$$
  
 Standard enthalpy of formation at 298.15K for  
 $\text{CO}_{2(g)} = -393.8 \text{ KJ/mol}$   
 $\text{H}_2\text{O}_{(g)} = -242 \text{ KJ/mol}$   
 $\text{C}_5\text{H}_{12(g)} = -146.5 \text{ KJ/mol}$   
 c) Explain the different heat losses in boiler and draw model heat balance sheet for boiler. **04**
- Q.3** a) A steam power plant working on Rankine cycle has range of operations 50 bar to 0.08 bar. **06**  
 The steam at the entry of turbine is dry saturated.  
 Calculate -  
 i) Dryness fraction at the end of expansion  
 ii) Turbine work  
 iii) Cycle Efficiency  
 b) Explain - Equivalent evaporation and Boiler efficiency **04**  
 c) Compare heat engine and heat pump. **04**
- Q.4** a) The following readings were obtained during a boiler trial of 6 hours duration. **05**  
 Mean steam pressure 12 bar, mass of steam generated 40000Kg, mean dryness fraction as 0.80. Mean feed water temperature 30°C, coal used 4000 Kg, Calorific value of coal is 33600 KJ/Kg.  
 Calculate –  
 i) Equivalent evaporation  
 ii) Boiler efficiency  
 b) Explain the Rankine cycle with neat diagram. **05**  
 c) Explain with the help of property diagram, phase change process of water. **04**

**Section – II**

- Q.5**   **a)** In a De-Laval turbine steam issues from a nozzle with a velocity of 1200m/s. **05**  
The nozzle angle is  $20^\circ$ . The mean blade speed is 400 m/s, inlet and outlet angles are equal. The mass of steam flowing through the turbine per hour is 1000kg,  
Calculate:  
i) Blade angles  
ii) Relative velocity of blade entering the blade  
iii) Blade efficiency
- b)** Explain with neat sketch any one type surface condenser. **05**
- c)** What is nozzle? Explain the types of nozzle with neat sketches **04**
- Q.6**   **a)** Derive an expression for intermediate pressure for a two stage compressor with minimum work input. **05**
- b)** A Compressor compresses air from 1 bar to 7 bar. The clearance volume is 2.13 lit. Compression and expansion are polytropic with  $n=1.3$ , volumetric efficiency is 85%. **05**  
Determine:  
i) Stroke volume  
ii) Diameter of cylinder if length of stroke is 30 cm.
- c)** Explain the classification of steam turbines. **04**
- Q.7**   **a)** What is mean by compounding of steam turbine? What are its different methods? Explain any one method with neat diagram. **05**
- b)** Derive an expression for work done equation of compressor with and without clearance **05**
- c)** Write the difference between jet and surface condenser. **04**

# R

## Max. Marks: 70

Marks: 14

## 14

- Page 9 of 16



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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Applied Thermodynamics**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume additional suitable data if necessary and state it clearly.  
 4) Use of Steam and scientific calculator is allowed.

**Section – I**

- Q.2** a) Explain the effect of operating conditions on the efficiency of Rankine cycle. **05**  
 b) Calculate the standard enthalpy change at 298.15K for the reaction **05**  

$$\text{C}_5\text{H}_{12(g)} + 8\text{O}_2 \longrightarrow 5\text{CO}_{2(g)} + 6\text{H}_2\text{O}_g$$
  
 Standard enthalpy of formation at 298.15K for  
 $\text{CO}_{2(g)} = -393.8 \text{ KJ/mol}$   
 $\text{H}_2\text{O}_{(g)} = -242 \text{ KJ/mol}$   
 $\text{C}_5\text{H}_{12(g)} = -146.5 \text{ KJ/mol}$   
 c) Explain the different heat losses in boiler and draw model heat balance sheet for boiler. **04**
- Q.3** a) A steam power plant working on Rankine cycle has range of operations 50 bar to 0.08 bar. **06**  
 The steam at the entry of turbine is dry saturated.  
 Calculate -  
 i) Dryness fraction at the end of expansion  
 ii) Turbine work  
 iii) Cycle Efficiency  
 b) Explain - Equivalent evaporation and Boiler efficiency **04**  
 c) Compare heat engine and heat pump. **04**
- Q.4** a) The following readings were obtained during a boiler trial of 6 hours duration. **05**  
 Mean steam pressure 12 bar, mass of steam generated 40000Kg, mean dryness fraction as 0.80. Mean feed water temperature 30°C, coal used 4000 Kg, Calorific value of coal is 33600 KJ/Kg.  
 Calculate –  
 i) Equivalent evaporation  
 ii) Boiler efficiency  
 b) Explain the Rankine cycle with neat diagram. **05**  
 c) Explain with the help of property diagram, phase change process of water. **04**

**Section – II**

- Q.5**   **a)**   In a De-Laval turbine steam issues from a nozzle with a velocity of 1200m/s. **05**  
The nozzle angle is  $20^\circ$ . The mean blade speed is 400 m/s, inlet and outlet angles are equal. The mass of steam flowing through the turbine per hour is 1000kg,  
Calculate:  
i) Blade angles  
ii) Relative velocity of blade entering the blade  
iii) Blade efficiency
- b)**   Explain with neat sketch any one type surface condenser. **05**
- c)**   What is nozzle? Explain the types of nozzle with neat sketches **04**
- Q.6**   **a)**   Derive an expression for intermediate pressure for a two stage compressor with minimum work input. **05**
- b)**   A Compressor compresses air from 1 bar to 7 bar. The clearance volume is 2.13 lit. Compression and expansion are polytropic with  $n=1.3$ , volumetric efficiency is 85%. **05**  
Determine:  
i) Stroke volume  
ii) Diameter of cylinder if length of stroke is 30 cm.
- c)**   Explain the classification of steam turbines. **04**
- Q.7**   **a)**   What is mean by compounding of steam turbine? What are its different methods? Explain any one method with neat diagram. **05**
- b)**   Derive an expression for work done equation of compressor with and without clearance **05**
- c)**   Write the difference between jet and surface condenser. **04**

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Set **S**

**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Applied Thermodynamics**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks  
 4) Use of Steam table and scientific calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In Rankine cycle, the work output from turbine is obtained by \_\_\_\_\_.
  - a) Change in internal energy between inlet and outlet
  - b) Change in enthalpy between inlet and outlet
  - c) Change in entropy between inlet and outlet
  - d) Change in temperature between inlet and outlet
- 2) Latent heat of vaporization of water at critical point is \_\_\_\_\_.
  - a) Zero
  - b) 539 kcal/kg
  - c) 1 kcal/kg
  - d) 2257 KJ/Kg
- 3) The steam leaves the nozzle at \_\_\_\_\_.
  - a) High pressure and low velocity
  - b) Low pressure and low velocity
  - c) High pressure and high velocity
  - d) Low pressure and high velocity
- 4) In intercooler the pressure of the compresses air \_\_\_\_\_.
  - a) Reduces
  - b) Increases
  - c) Remains same
  - d) None of these
- 5) For Parson's reaction steam turbine, the degree of reaction is \_\_\_\_\_.
  - a) 70%
  - b) 100%
  - c) 25%
  - d) 50%
- 6) Dryness fraction (x) of superheated steam is \_\_\_\_\_.
  - a) Less than 1
  - b) Greater than 1
  - c) Equals to 1
  - d) None of these
- 7) Standard Enthalpy of formation is measured at \_\_\_\_\_.
  - a) 25° C and 10 atm
  - b) 0° C and 1 atm
  - c) 100° C and 1 atm
  - d) 25° C and 1 atm
- 8) Compounding of steam turbine is done to \_\_\_\_\_.
  - a) To balance the rotor
  - b) Reduce the blade friction
  - c) Reduce the rotor speed
  - d) To increase the rotor speed



- 9) Evaporative type of condenser has \_\_\_\_\_.  
a) Steam in pipe surrounded by water  
b) water in pipe surrounded by steam  
c) Either a and b  
d) None of these
- 10) Rankin cycle comprises of \_\_\_\_\_.  
a) Two isentropic and two constant volume processes  
b) Two isentropic and two constant pressure processes  
c) Two isothermal and two isentropic  
d) None of these
- 11) Volumetric efficiency is always \_\_\_\_\_.  
a) Less than 1  
b) equal to 1  
c) Greater than 1  
d) In between 1 & 5
- 12) The term coefficient of performance (COP) is related with \_\_\_\_\_.  
a) Heat Pump  
b) Heat Engine  
c) Steam Engine  
d) Gas Turbine
- 13) If pressure on water increases then saturation temperature \_\_\_\_\_.  
a) remains constant  
b) decreases  
c) increases remain constant  
d) none of these
- 14) Which of among the following is the boiler mounting?  
a) Air preheater  
b) Economizer  
c) Fusible plug  
d) Super heater

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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Applied Thermodynamics**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume additional suitable data if necessary and state it clearly.  
 4) Use of Steam and scientific calculator is allowed.

**Section – I**

- Q.2** a) Explain the effect of operating conditions on the efficiency of Rankine cycle. **05**  
 b) Calculate the standard enthalpy change at 298.15K for the reaction **05**  

$$\text{C}_5\text{H}_{12(g)} + 8\text{O}_2 \longrightarrow 5\text{CO}_{2(g)} + 6\text{H}_2\text{O}_g$$
  
 Standard enthalpy of formation at 298.15K for  
 $\text{CO}_{2(g)} = -393.8 \text{ KJ/mol}$   
 $\text{H}_2\text{O}_{(g)} = -242 \text{ KJ/mol}$   
 $\text{C}_5\text{H}_{12(g)} = -146.5 \text{ KJ/mol}$   
 c) Explain the different heat losses in boiler and draw model heat balance sheet for boiler. **04**
- Q.3** a) A steam power plant working on Rankine cycle has range of operations 50 bar to 0.08 bar. **06**  
 The steam at the entry of turbine is dry saturated.  
 Calculate -  
 i) Dryness fraction at the end of expansion  
 ii) Turbine work  
 iii) Cycle Efficiency  
 b) Explain - Equivalent evaporation and Boiler efficiency **04**  
 c) Compare heat engine and heat pump. **04**
- Q.4** a) The following readings were obtained during a boiler trial of 6 hours duration. **05**  
 Mean steam pressure 12 bar, mass of steam generated 40000Kg, mean dryness fraction as 0.80. Mean feed water temperature 30°C, coal used 4000 Kg, Calorific value of coal is 33600 KJ/Kg.  
 Calculate –  
 i) Equivalent evaporation  
 ii) Boiler efficiency  
 b) Explain the Rankine cycle with neat diagram. **05**  
 c) Explain with the help of property diagram, phase change process of water. **04**

**Section – II**

- Q.5** a) In a De-Laval turbine steam issues from a nozzle with a velocity of 1200m/s. The nozzle angle is  $20^\circ$ . The mean blade speed is 400 m/s, inlet and outlet angles are equal. The mass of steam flowing through the turbine per hour is 1000kg, Calculate:  
i) Blade angles  
ii) Relative velocity of blade entering the blade  
iii) Blade efficiency **05**
- b) Explain with neat sketch any one type surface condenser. **05**
- c) What is nozzle? Explain the types of nozzle with neat sketches **04**
- Q.6** a) Derive an expression for intermediate pressure for a two stage compressor with minimum work input. **05**
- b) A Compressor compresses air from 1 bar to 7 bar. The clearance volume is 2.13 lit. Compression and expansion are polytropic with  $n=1.3$ , volumetric efficiency is 85%. Determine:  
i) Stroke volume  
ii) Diameter of cylinder if length of stroke is 30 cm. **05**
- c) Explain the classification of steam turbines. **04**
- Q.7** a) What is mean by compounding of steam turbine? What are its different methods? Explain any one method with neat diagram. **05**
- b) Derive an expression for work done equation of compressor with and without clearance **05**
- c) Write the difference between jet and surface condenser. **04**

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Day & Date: Wednesday, 15-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 1 of 16

- 8) For a simply supported beam carrying U.D.L. over entire span, shape of SFD is
- a) Parabolic
  - b) triangular
  - c) Two equal and opposite rectangle
  - d) Two equal and opposite triangle
- 9) When simply supported beam is loaded maximum compressive stress shall develop at
- a) at the neutral layer
  - b) top layer
  - c) Bottom layer
  - d) None of above
- 10) For a triangular section subjected to shear force, the intensity of shear stress is maximum at
- a) at the base of triangle
  - b) at  $h/2$  from base
  - c) At neutral axis
  - d) At vertex of triangle
- 11) The radius of Mohr's stress circle indicates
- a) Maximum normal stress
  - b) Minimum normal stress
  - c) Maximum shear stress
  - d) Minimum shear stress
- 12) On a principal plane, the shear stress is
- a) maximum
  - b) minimum
  - c) zero
  - d) average
- 13) For a simply supported beam carrying a U.D.L. on its entire span, the slope is
- a) same as deflection
  - b) zero at support
  - c) zero at center
  - d) maximum at center
- 14) On an element, perpendicular tensile stresses are 100 MPa and 50 MPa. The normal stress acting on the plane of maximum shear stress is
- a) 75 MPa (tensile)
  - b) 25 MPa (tensile)
  - c) 75 MPa (compressive)
  - d) 25 MPa (compressive)

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Mechanics of Materials**

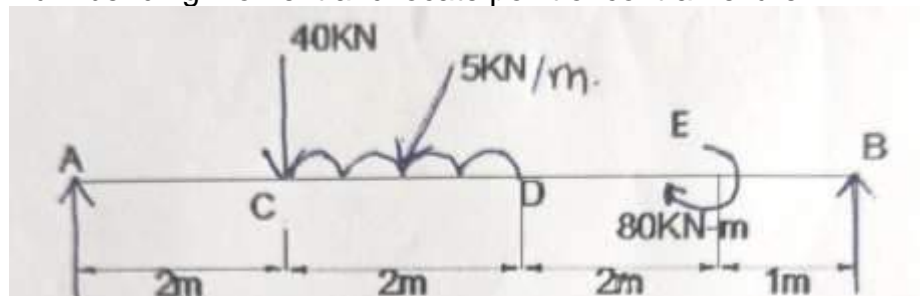
Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.  
 4) Use of scientific calculator is allowed.

**Section – I**

- Q.2 a)** A steel rod 40mm diameter 1000mm long is coaxially enclosed in brass tube of 60mm external diameter 4mm thickness and 1000mm length. Determine the stresses & load shared by each material and also change in length of assembly, if the assembly is subjected to an axial compressive force of 150kN.  $E_{\text{steel}}=200\text{Gpa}$  and  $E_{\text{brass}}=100\text{Gpa}$  **08**
- b)** A load of 100N falls through a height of 2 cm on to a collar rigidly attached to it to the lower end of vertical bar 1.5m long and of  $150\text{ mm}^2$  cross sectional area. The upper end of vertical bar is fixed Determine **06**
- 1) Maximum stress induced in bar
  - 2) Maximum elongation
  - 3) Strain energy stored  $E=200\text{Gpa}$
- Q.3 a)** A shaft of hollow circular cross section has outer diameter 120mm and inner diameter 80mm. It is subjected to a torque of 20 kN-m. Determine: **06**
- 1) Shear stress at outer surface
  - 2) shear stress at inner surface
  - 3) angle of twist over length of 3m. Assume  $G=85\text{Gpa}$ .
- b)** Draw SFD and BMD of simply supported beam as shown in figure. Find Maximum bending moment and locate point of contra-flexure. **08**



- Q.4 a)** A bar of steel 80 x 65 mm in cross section and 290mm long. It is subjected to a tensile load of 280 kN along longitudinal axis, compressive load of 650kN in Y-direction and 500 kN tensile load in Z-direction in respective lateral direction. Find change in Volume of bar  $E=200\text{Gpa}$  and  $\mu=0.3$  **06**
- b)** A weight of 2kN is dropped on the collar attached at the lower end of vertical bar 3 m long and 28 mm diameter. Calculate height of drop if maximum instantaneous stress is not to exceed 150mpa. Also calculate instantaneous elongation. Take  $E=200\text{Gpa}$ . **04**
- c)** Draw SFD and BMD for Cantilever beam having length (L) and subjected to point load 'W' at free end. **04**

**Section – II**

- Q.5**   **a)**   At a point in a bracket the stresses on two mutually perpendicular planes are 120 mpa and 80 mpa both tensile in nature, together with shear stress of 20 mpa tends to rotate the block in clockwise direction. Find the magnitude and direction of resultant stress on plane making an angle of 30 degree with plane of first stress. Also find angle of obliquity and maximum shear stress      **08**
- b)**   A hollow rectangular section 30mm x 60mm inside dimension and 10mm thick is subjected to shear force of 40kN. Calculate ratio of maximum shear stress to average shear stress.      **06**
- Q.6**   **a)**   A beam of T section having top flange 120 mm x 20 mm and web 20 mm x 100mm simply supported over span of 5 m and carries point load of 3 kN at mid span. Determine maximum tensile and compressive stresses developed.      **08**
- b)**   A simply supported beam of 6meter span carries uniformly distributed load of 6kN/m over its entire span. The cross section of beam is 120 x 180 mm in size. Calculate the maximum slope at support and maximum deflection at center. Take  $E=11 \text{ Gpa}$ .      **06**
- Q.7**   **a)**   Define Slope and Deflection of beam. Describe concept in brief for simply supported and cantilever beam.      **04**
- b)**   A cantilever beam has length 4 m subjected to point load of 250N at free end. It is of hollow square section of outer size 50mm and inner size 40mm. Find maximum bending stresses.      **05**
- c)**   At a point in elastic material under strain, there are normal tensile stresses of 90 Mpa and 40 Mpa respectively at the right angles to each other along with a shear stress of 25 Mpa. Find graphically principal stresses and maximum shear stress.      **05**

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Mechanics of Materials**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) For a simply supported beam carrying U.D.L. over entire span, shape of SFD is
  - a) Parabolic
  - b) triangular
  - c) Two equal and opposite rectangle
  - d) Two equal and opposite triangle
- 2) When simply supported beam is loaded maximum compressive stress shall develop at
 

|                         |                  |
|-------------------------|------------------|
| a) at the neutral layer | b) top layer     |
| c) Bottom layer         | d) None of above |
- 3) For a triangular section subjected to shear force, the intensity of shear stress is maximum at
 

|                            |                          |
|----------------------------|--------------------------|
| a) at the base of triangle | b) at h/2 from base      |
| c) At neutral axis         | d) At vertex of triangle |
- 4) The radius of Mohr's stress circle indicates
 

|                          |                          |
|--------------------------|--------------------------|
| a) Maximum normal stress | b) Minimum normal stress |
| c) Maximum shear stress  | d) Minimum shear stress  |
- 5) On a principal plane, the shear stress is
 

|            |            |
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| a) maximum | b) minimum |
| c) zero    | d) average |
- 6) For a simply supported beam carrying a U.D.L. on its entire span, the slope is
 

|                       |                      |
|-----------------------|----------------------|
| a) same as deflection | b) zero at support   |
| c) zero at center     | d) maximum at center |
- 7) On an element, perpendicular tensile stresses are 100 MPa and 50 MPa. The normal stress acting on the plane of maximum shear stress is
 

|                         |                         |
|-------------------------|-------------------------|
| a) 75 MPa (tensile)     | b) 25 MPa (tensile)     |
| c) 75 MPa (compressive) | d) 25 MPa (compressive) |



- 8) The percentage elongation and the percentage reduction in area depends upon \_\_\_\_\_.  
a) Tensile strength of the material  
b) Ductility of the material  
c) Toughness of the material  
d) hardness of material
- 9) For a material with Poisson's ratio 0.25, the ratio of Elastic modulus to shear modulus is \_\_\_\_\_.  
a) 2.55  
b) 2.5  
c) 3.0  
d) 1.5
- 10) If diameter of shaft is doubled, power transmitted 'P' can be increased to  
a) 16P  
b) 2P  
c) 8P  
d) 4P
- 11) In case of a cantilever beam, maximum B.M. and maximum S.F. always occur at  
a) Couple end  
b) Fixed end  
c) Free end  
d) Mid span
- 12) The angle of twist \_\_\_\_\_ proportional to the twisting moment.  
a) Directly  
b) Inversely  
c) Either a) or b)  
d) None
- 13) Modulus of resilience is the ratio of  
a) minimum strain energy and unit volume  
b) direct stress and unit volume  
c) proof resilience and unit volume  
d) resilience and unit area
- 14) For a simply supported beam carrying a couple, its B.M.D. shows  
a) zero bending moment  
b) rise or fall in bending moment  
c) maximum bending moment  
d) minimum bending moment

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Mechanics of Materials**

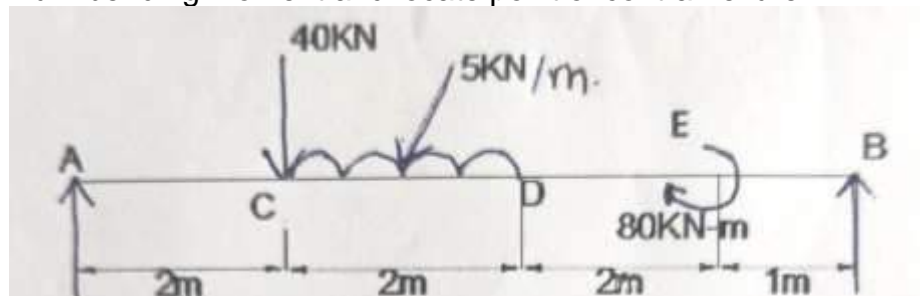
Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.  
 4) Use of scientific calculator is allowed.

**Section – I**

- Q.2 a)** A steel rod 40mm diameter 1000mm long is coaxially enclosed in brass tube of 60mm external diameter 4mm thickness and 1000mm length. Determine the stresses & load shared by each material and also change in length of assembly, if the assembly is subjected to an axial compressive force of 150kN.  $E_{\text{steel}}=200\text{Gpa}$  and  $E_{\text{brass}}=100\text{Gpa}$  **08**
- b)** A load of 100N falls through a height of 2 cm on to a collar rigidly attached to it to the lower end of vertical bar 1.5m long and of  $150\text{ mm}^2$  cross sectional area. The upper end of vertical bar is fixed Determine **06**
- 1) Maximum stress induced in bar
  - 2) Maximum elongation
  - 3) Strain energy stored  $E=200\text{Gpa}$
- Q.3 a)** A shaft of hollow circular cross section has outer diameter 120mm and inner diameter 80mm. It is subjected to a torque of 20 kN-m. Determine: **06**
- 1) Shear stress at outer surface
  - 2) shear stress at inner surface
  - 3) angle of twist over length of 3m. Assume  $G=85\text{Gpa}$ .
- b)** Draw SFD and BMD of simply supported beam as shown in figure. Find Maximum bending moment and locate point of contra-flexure. **08**



- Q.4 a)** A bar of steel 80 x 65 mm in cross section and 290mm long. It is subjected to a tensile load of 280 kN along longitudinal axis, compressive load of 650kN in Y-direction and 500 kN tensile load in Z-direction in respective lateral direction. Find change in Volume of bar  $E=200\text{Gpa}$  and  $\mu=0.3$  **06**
- b)** A weight of 2kN is dropped on the collar attached at the lower end of vertical bar 3 m long and 28 mm diameter. Calculate height of drop if maximum instantaneous stress is not to exceed 150mpa. Also calculate instantaneous elongation. Take  $E=200\text{Gpa}$ . **04**
- c)** Draw SFD and BMD for Cantilever beam having length (L) and subjected to point load 'W' at free end. **04**

**Section – II**

- Q.5** a) At a point in a bracket the stresses on two mutually perpendicular planes are 120 mpa and 80 mpa both tensile in nature, together with shear stress of 20 mpa tends to rotate the block in clockwise direction. Find the magnitude and direction of resultant stress on plane making an angle of 30 degree with plane of first stress. Also find angle of obliquity and maximum shear stress **08**
- b) A hollow rectangular section 30mm x 60mm inside dimension and 10mm thick is subjected to shear force of 40kN. Calculate ratio of maximum shear stress to average shear stress. **06**
- Q.6** a) A beam of T section having top flange 120 mm x 20 mm and web 20 mm x 100mm simply supported over span of 5 m and carries point load of 3 kN at mid span. Determine maximum tensile and compressive stresses developed. **08**
- b) A simply supported beam of 6meter span carries uniformly distributed load of 6kN/m over its entire span. The cross section of beam is 120 x 180 mm in size. Calculate the maximum slope at support and maximum deflection at center. Take  $E=11 \text{ Gpa}$ . **06**
- Q.7** a) Define Slope and Deflection of beam. Describe concept in brief for simply supported and cantilever beam. **04**
- b) A cantilever beam has length 4 m subjected to point load of 250N at free end. It is of hollow square section of outer size 50mm and inner size 40mm. Find maximum bending stresses. **05**
- c) At a point in elastic material under strain, there are normal tensile stresses of 90 Mpa and 40 Mpa respectively at the right angles to each other along with a shear stress of 25 Mpa. Find graphically principal stresses and maximum shear stress. **05**

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Mechanics of Materials**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The radius of Mohr's stress circle indicates
 

|                          |                          |
|--------------------------|--------------------------|
| a) Maximum normal stress | b) Minimum normal stress |
| c) Maximum shear stress  | d) Minimum shear stress  |
- 2) On a principal plane, the shear stress is
 

|            |            |
|------------|------------|
| a) maximum | b) minimum |
| c) zero    | d) average |
- 3) For a simply supported beam carrying a U.D.L. on its entire span, the slope is
 

|                       |                      |
|-----------------------|----------------------|
| a) same as deflection | b) zero at support   |
| c) zero at center     | d) maximum at center |
- 4) On an element, perpendicular tensile stresses are 100 MPa and 50 MPa. The normal stress acting on the plane of maximum shear stress is
 

|                         |                         |
|-------------------------|-------------------------|
| a) 75 MPa (tensile)     | b) 25 MPa (tensile)     |
| c) 75 MPa (compressive) | d) 25 MPa (compressive) |
- 5) The percentage elongation and the percentage reduction in area depends upon \_\_\_\_\_.
 

|                                     |
|-------------------------------------|
| a) Tensile strength of the material |
| b) Ductility of the material        |
| c) Toughness of the material        |
| d) hardness of material             |
- 6) For a material with Poisson's ratio 0.25, the ratio of Elastic modulus to shear modulus is \_\_\_\_\_.
 

|         |        |
|---------|--------|
| a) 2.55 | b) 2.5 |
| c) 3.0  | d) 1.5 |
- 7) If diameter of shaft is doubled, power transmitted 'P' can be increased to
 

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| a) 16P | b) 2P |
| c) 8P  | d) 4P |

- Page 10 of 16

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Mechanics of Materials**

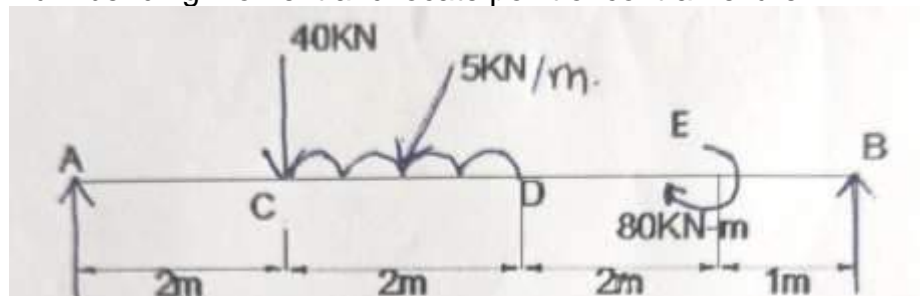
Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.  
 4) Use of scientific calculator is allowed.

**Section – I**

- Q.2 a)** A steel rod 40mm diameter 1000mm long is coaxially enclosed in brass tube of 60mm external diameter 4mm thickness and 1000mm length. Determine the stresses & load shared by each material and also change in length of assembly, if the assembly is subjected to an axial compressive force of 150kN.  $E_{\text{steel}}=200\text{Gpa}$  and  $E_{\text{brass}}=100\text{Gpa}$  **08**
- b)** A load of 100N falls through a height of 2 cm on to a collar rigidly attached to it to the lower end of vertical bar 1.5m long and of  $150\text{ mm}^2$  cross sectional area. The upper end of vertical bar is fixed Determine **06**
- 1) Maximum stress induced in bar
  - 2) Maximum elongation
  - 3) Strain energy stored  $E=200\text{Gpa}$
- Q.3 a)** A shaft of hollow circular cross section has outer diameter 120mm and inner diameter 80mm. It is subjected to a torque of 20 kN-m. Determine: **06**
- 1) Shear stress at outer surface
  - 2) shear stress at inner surface
  - 3) angle of twist over length of 3m. Assume  $G=85\text{Gpa}$ .
- b)** Draw SFD and BMD of simply supported beam as shown in figure. Find Maximum bending moment and locate point of contra-flexure. **08**



- Q.4 a)** A bar of steel 80 x 65 mm in cross section and 290mm long. It is subjected to a tensile load of 280 kN along longitudinal axis, compressive load of 650kN in Y-direction and 500 kN tensile load in Z-direction in respective lateral direction. Find change in Volume of bar  $E=200\text{Gpa}$  and  $\mu=0.3$  **06**
- b)** A weight of 2kN is dropped on the collar attached at the lower end of vertical bar 3 m long and 28 mm diameter. Calculate height of drop if maximum instantaneous stress is not to exceed 150mpa. Also calculate instantaneous elongation. Take  $E=200\text{Gpa}$ . **04**
- c)** Draw SFD and BMD for Cantilever beam having length (L) and subjected to point load 'W' at free end. **04**

**Section – II**

- Q.5** a) At a point in a bracket the stresses on two mutually perpendicular planes are 120 mpa and 80 mpa both tensile in nature, together with shear stress of 20 mpa tends to rotate the block in clockwise direction. Find the magnitude and direction of resultant stress on plane making an angle of 30 degree with plane of first stress. Also find angle of obliquity and maximum shear stress **08**
- b) A hollow rectangular section 30mm x 60mm inside dimension and 10mm thick is subjected to shear force of 40kN. Calculate ratio of maximum shear stress to average shear stress. **06**
- Q.6** a) A beam of T section having top flange 120 mm x 20 mm and web 20 mm x 100mm simply supported over span of 5 m and carries point load of 3 kN at mid span. Determine maximum tensile and compressive stresses developed. **08**
- b) A simply supported beam of 6meter span carries uniformly distributed load of 6kN/m over its entire span. The cross section of beam is 120 x 180 mm in size. Calculate the maximum slope at support and maximum deflection at center. Take  $E=11 \text{ Gpa}$ . **06**
- Q.7** a) Define Slope and Deflection of beam. Describe concept in brief for simply supported and cantilever beam. **04**
- b) A cantilever beam has length 4 m subjected to point load of 250N at free end. It is of hollow square section of outer size 50mm and inner size 40mm. Find maximum bending stresses. **05**
- c) At a point in elastic material under strain, there are normal tensile stresses of 90 Mpa and 40 Mpa respectively at the right angles to each other along with a shear stress of 25 Mpa. Find graphically principal stresses and maximum shear stress. **05**

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Mechanics of Materials**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Modulus of resilience is the ratio of
  - a) minimum strain energy and unit volume
  - b) direct stress and unit volume
  - c) proof resilience and unit volume
  - d) resilience and unit area
- 2) For a simply supported beam carrying a couple, its B.M.D. shows
  - a) zero bending moment
  - b) rise or fall in bending moment
  - c) maximum bending moment
  - d) minimum bending moment
- 3) For a simply supported beam carrying U.D.L. over entire span, shape of SFD is
  - a) Parabolic
  - b) triangular
  - c) Two equal and opposite rectangle
  - d) Two equal and opposite triangle
- 4) When simply supported beam is loaded maximum compressive stress shall develop at
  - a) at the neutral layer
  - b) top layer
  - c) Bottom layer
  - d) None of above
- 5) For a triangular section subjected to shear force, the intensity of shear stress is maximum at
  - a) at the base of triangle
  - b) at  $h/2$  from base
  - c) At neutral axis
  - d) At vertex of triangle
- 6) The radius of Mohr's stress circle indicates
  - a) Maximum normal stress
  - b) Minimum normal stress
  - c) Maximum shear stress
  - d) Minimum shear stress
- 7) On a principal plane, the shear stress is
  - a) maximum
  - b) minimum
  - c) zero
  - d) average



- 8) For a simply supported beam carrying a U.D.L. on its entire span, the slope is  
a) same as deflection                      b) zero at support  
c) zero at center                          d) maximum at center
- 9) On an element, perpendicular tensile stresses are 100 MPa and 50 MPa. The normal stress acting on the plane of maximum shear stress is  
a) 75 MPa (tensile)                      b) 25 MPa (tensile)  
c) 75 MPa (compressive)              d) 25 MPa (compressive)
- 10) The percentage elongation and the percentage reduction in area depends upon \_\_\_\_\_.  
a) Tensile strength of the material  
b) Ductility of the material  
c) Toughness of the material  
d) hardness of material
- 11) For a material with Poisson's ratio 0.25, the ratio of Elastic modulus to shear modulus is \_\_\_\_\_.  
a) 2.55                                      b) 2.5  
c) 3.0                                        d) 1.5
- 12) If diameter of shaft is doubled, power transmitted 'P' can be increased to  
a) 16P                                        b) 2P  
c) 8P                                         d) 4P
- 13) In case of a cantilever beam, maximum B.M. and maximum S.F. always occur at  
a) Couple end                              b) Fixed end  
c) Free end                                  d) Mid span
- 14) The angle of twist \_\_\_\_\_ proportional to the twisting moment.  
a) Directly                                  b) Inversely  
c) Either a) or b)                        d) None

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**MECHANICAL ENGINEERING**  
**Mechanics of Materials**

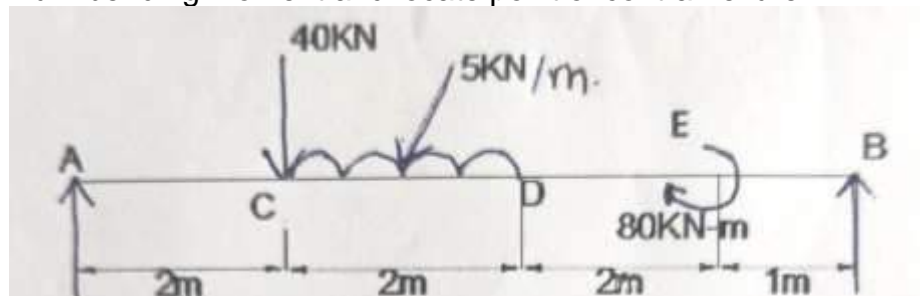
Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.  
 4) Use of scientific calculator is allowed.

**Section – I**

- Q.2 a)** A steel rod 40mm diameter 1000mm long is coaxially enclosed in brass tube of 60mm external diameter 4mm thickness and 1000mm length. Determine the stresses & load shared by each material and also change in length of assembly, if the assembly is subjected to an axial compressive force of 150kN.  $E_{\text{steel}}=200\text{Gpa}$  and  $E_{\text{brass}}=100\text{Gpa}$  **08**
- b)** A load of 100N falls through a height of 2 cm on to a collar rigidly attached to it to the lower end of vertical bar 1.5m long and of  $150\text{ mm}^2$  cross sectional area. The upper end of vertical bar is fixed Determine  
 1) Maximum stress induced in bar  
 2) Maximum elongation  
 3) Strain energy stored  $E=200\text{Gpa}$  **06**
- Q.3 a)** A shaft of hollow circular cross section has outer diameter 120mm and inner diameter 80mm. It is subjected to a torque of 20 kN-m. Determine:  
 1) Shear stress at outer surface  
 2) shear stress at inner surface  
 3) angle of twist over length of 3m. Assume  $G=85\text{Gpa}$ . **06**
- b)** Draw SFD and BMD of simply supported beam as shown in figure. Find Maximum bending moment and locate point of contra-flexure. **08**



- Q.4 a)** A bar of steel 80 x 65 mm in cross section and 290mm long. It is subjected to a tensile load of 280 kN along longitudinal axis, compressive load of 650kN in Y-direction and 500 kN tensile load in Z-direction in respective lateral direction. Find change in Volume of bar  $E=200\text{Gpa}$  and  $\mu=0.3$  **06**
- b)** A weight of 2kN is dropped on the collar attached at the lower end of vertical bar 3 m long and 28 mm diameter. Calculate height of drop if maximum instantaneous stress is not to exceed 150mpa. Also calculate instantaneous elongation. Take  $E=200\text{Gpa}$ . **04**
- c)** Draw SFD and BMD for Cantilever beam having length (L) and subjected to point load 'W' at free end. **04**

**Section – II**

- Q.5 a)** At a point in a bracket the stresses on two mutually perpendicular planes are 120 mpa and 80 mpa both tensile in nature, together with shear stress of 20 mpa tends to rotate the block in clockwise direction. Find the magnitude and direction of resultant stress on plane making an angle of 30 degree with plane of first stress. Also find angle of obliquity and maximum shear stress **08**
- b)** A hollow rectangular section 30mm x 60mm inside dimension and 10mm thick is subjected to shear force of 40kN. Calculate ratio of maximum shear stress to average shear stress. **06**
- Q.6 a)** A beam of T section having top flange 120 mm x 20 mm and web 20 mm x 100mm simply supported over span of 5 m and carries point load of 3 kN at mid span. Determine maximum tensile and compressive stresses developed. **08**
- b)** A simply supported beam of 6meter span carries uniformly distributed load of 6kN/m over its entire span. The cross section of beam is 120 x 180 mm in size. Calculate the maximum slope at support and maximum deflection at center. Take  $E=11$  Gpa. **06**
- Q.7 a)** Define Slope and Deflection of beam. Describe concept in brief for simply supported and cantilever beam. **04**
- b)** A cantilever beam has length 4 m subjected to point load of 250N at free end. It is of hollow square section of outer size 50mm and inner size 40mm. Find maximum bending stresses. **05**
- c)** At a point in elastic material under strain, there are normal tensile stresses of 90 Mpa and 40 Mpa respectively at the right angles to each other along with a shear stress of 25 Mpa. Find graphically principal stresses and maximum shear stress. **05**

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Processes**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 A) Choose the correct alternatives from the options.**

**14**

- 1) In \_\_\_\_\_ process wastage of material is high.
  - a) Casting
  - b) Forming
  - c) Machining
  - d) Welding
- 2) In sand molding, the middle part of joining two flask is called
  - a) Coupe
  - b) Parting line
  - c) Drag
  - d) Flask-middle
- 3) Casting process is preferred for parts having \_\_\_\_\_.
  - a) A few details
  - b) Many details
  - c) No details
  - d) Non-symmetrical shape
- 4) For mounting several patterns at a time, following type of pattern is used
  - a) Combined pattern
  - b) Loose piece pattern
  - c) Sweep pattern
  - d) Match plate pattern
- 5) Draft on pattern for casting is
  - a) Shrinkage allowance
  - b) Identification number marked on it
  - c) Taper to facilitate its removal from mould
  - d) Increase in size of cavity due shaking of pattern
- 6) Which if the following materials has more shrinkage allowance
  - a) Cast iron
  - b) Brass
  - c) Lead
  - d) Aluminum alloy
- 7) Higher ramming density gives\_ to mould
  - a) Good collapsibility
  - b) Low Permeability
  - c) Low Strength
  - d) High Permeability
- 8) Which is incorrect statement about results of hot working
  - a) Annealing operation is not necessary
  - b) Power requirements are low
  - c) Surface finish is good
  - d) Grain refinement is possible

## 06

- 02

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Processes**

Day &amp; Date: Friday, 17-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Answer any two full questions from each Section.  
 2) Figures to the right indicate full marks.  
 3) Make suitable assumptions, if required and state them clearly.

**Section – I**

- Q.2** a) Write the basic steps in casting process. What are the advantages and limitations of sand casting? **06**  
 b) Write different stages in core making. What do you understand by core setting? **05**  
 c) Differentiate clearly between Open riser and Blind riser. **03**
- Q.3** a) Enlist different types of core boxes. Explain any two core boxes in detail. **06**  
 b) Explain advantages and limitations of shell molding process. **05**  
 c) Suggest the suitable casting technique for manufacturing of: 4 **03**  
     1) Milling machine Bed  
     2) Ingots  
     3) Carburetor body  
     4) Art castings
- Q.4** a) What is 'MMAW' process of welding? Explain its working with applications. **06**  
 b) Differentiate clearly between Brazing and Soldering. **05**  
 c) Write a note on "Resistance welding". **03**

**Section – II**

- Q.5** a) What is rapid prototyping? Explain in brief basic principle and classification of RP. **06**  
 b) Classify the advance forming processes. Explain in brief about two advance forming processes. **05**  
 c) With neat sketch explain the process of wire drawing. **03**
- Q.6** a) Explain with neat sketch direct and indirect extrusion. **06**  
 b) How to classify conventional forming process. Explain with neat sketch upset forging process. **05**  
 c) With neat sketch explain the process of tube drawing. **03**
- Q.7** a) What do you know about open die and close die forging? Explain with a neat sketch. **06**  
 b) Write a short note on types of rolling mills. **05**  
 c) Explain with nice diagram high energy rate forming process. **03**

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Processes**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 A) Choose the correct alternatives from the options.**

**14**

- 1) Draft on pattern for casting is
  - a) Shrinkage allowance
  - b) Identification number marked on it
  - c) Taper to facilitate its removal from mould
  - d) Increase in size of cavity due shaking of pattern
- 2) Which if the following materials has more shrinkage allowance
  - a) Cast iron
  - b) Brass
  - c) Lead
  - d) Aluminum alloy
- 3) Higher ramming density gives\_ to mould
  - a) Good collapsibility
  - b) Low Permeability
  - c) Low Strength
  - d) High Permeability
- 4) Which is incorrect statement about results of hot working
  - a) Annealing operation is not necessary
  - b) Power requirements are low
  - c) Surface finish is good
  - d) Grain refinement is possible
- 5) In \_\_\_\_\_ process wastage of material is high.
  - a) Casting
  - b) Forming
  - c) Machining
  - d) Welding
- 6) In sand molding, the middle part of joining two flask is called
  - a) Coupe
  - b) Parting line
  - c) Drag
  - d) Flask-middle
- 7) Casting process is preferred for parts having \_\_\_\_\_.
  - a) A few details
  - b) Many details
  - c) No details
  - d) Non-symmetrical shape
- 8) For mounting several patterns at a time, following type of pattern is used
  - a) Combined pattern
  - b) Loose piece pattern
  - c) Sweep pattern
  - d) Match plate pattern

**B) MCQ with more than one answer correct:****06**

- |    |                                                                                 |    |
|----|---------------------------------------------------------------------------------|----|
| 1) | Which one of the following is an advantage of forging?                          | 02 |
|    | a) good surface finish                      b) low tooling cost                 |    |
|    | c) open tolerance                              d) improved physical property    |    |
| 2) | External screw threads can be produced by                                       | 02 |
|    | a) Milling                                              b) Pressing             |    |
|    | c) Forging                                              d) Rolling              |    |
| 3) | Which of the following material cannot be forged?                               | 02 |
|    | a) white iron                                              b) cast iron         |    |
|    | c) mild steel                                              d) high carbon steel |    |



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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Processes**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two full questions from each Section.  
 2) Figures to the right indicate full marks.  
 3) Make suitable assumptions, if required and state them clearly.

**Section – I**

- Q.2** a) Write the basic steps in casting process. What are the advantages and limitations of sand casting? **06**  
 b) Write different stages in core making. What do you understand by core setting? **05**  
 c) Differentiate clearly between Open riser and Blind riser. **03**
- Q.3** a) Enlist different types of core boxes. Explain any two core boxes in detail. **06**  
 b) Explain advantages and limitations of shell molding process. **05**  
 c) Suggest the suitable casting technique for manufacturing of: 4 **03**  
     1) Milling machine Bed  
     2) Ingots  
     3) Carburetor body  
     4) Art castings
- Q.4** a) What is 'MMAW' process of welding? Explain its working with applications. **06**  
 b) Differentiate clearly between Brazing and Soldering. **05**  
 c) Write a note on "Resistance welding". **03**

**Section – II**

- Q.5** a) What is rapid prototyping? Explain in brief basic principle and classification of RP. **06**  
 b) Classify the advance forming processes. Explain in brief about two advance forming processes. **05**  
 c) With neat sketch explain the process of wire drawing. **03**
- Q.6** a) Explain with neat sketch direct and indirect extrusion. **06**  
 b) How to classify conventional forming process. Explain with neat sketch upset forging process. **05**  
 c) With neat sketch explain the process of tube drawing. **03**
- Q.7** a) What do you know about open die and close die forging? Explain with a neat sketch. **06**  
 b) Write a short note on types of rolling mills. **05**  
 c) Explain with nice diagram high energy rate forming process. **03**

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Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data if necessary.

Marks: 14

14

- 1) Casting process is preferred for parts having \_\_\_\_\_.
  - a) A few details
  - b) Many details
  - c) No details
  - d) Non-symmetrical shape
- 2) For mounting several patterns at a time, following type of pattern is used
  - a) Combined pattern
  - b) Loose piece pattern
  - c) Sweep pattern
  - d) Match plate pattern
- 3) Draft on pattern for casting is
  - a) Shrinkage allowance
  - b) Identification number marked on it
  - c) Taper to facilitate its removal from mould
  - d) Increase in size of cavity due shaking of pattern
- 4) Which if the following materials has more shrinkage allowance
  - a) Cast iron
  - b) Brass
  - c) Lead
  - d) Aluminum alloy
- 5) Higher ramming density gives\_ to mould
  - a) Good collapsibility
  - b) Low Permeability
  - c) Low Strength
  - d) High Permeability
- 6) Which is incorrect statement about results of hot working
  - a) Annealing operation is not necessary
  - b) Power requirements are low
  - c) Surface finish is good
  - d) Grain refinement is possible
- 7) In \_\_\_\_\_ process wastage of material is high.
  - a) Casting
  - b) Forming
  - c) Machining
  - d) Welding
- 8) In sand molding, the middle part of joining two flask is called
  - a) Coupe
  - b) Parting line
  - c) Drag
  - d) Flask-middle

**B) MCQ with more than one answer correct:**

06

02

- |    |                                                        |                               |
|----|--------------------------------------------------------|-------------------------------|
| 1) | External screw threads can be produced by              | 02                            |
| a) | Milling                                                | b) Pressing                   |
| c) | Forging                                                | d) Rolling                    |
| 2) | Which of the following material cannot be forged?      | 02                            |
| a) | white iron                                             | b) cast iron                  |
| c) | mild steel                                             | d) high carbon steel          |
| 3) | Which one of the following is an advantage of forging? | 02                            |
| a) | good surface finish                                    | b) low tooling cost           |
| c) | open tolerance                                         | d) improved physical property |

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Processes**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Answer any two full questions from each Section.  
 2) Figures to the right indicate full marks.  
 3) Make suitable assumptions, if required and state them clearly.

**Section – I**

- Q.2** a) Write the basic steps in casting process. What are the advantages and limitations of sand casting? **06**  
 b) Write different stages in core making. What do you understand by core setting? **05**  
 c) Differentiate clearly between Open riser and Blind riser. **03**
- Q.3** a) Enlist different types of core boxes. Explain any two core boxes in detail. **06**  
 b) Explain advantages and limitations of shell molding process. **05**  
 c) Suggest the suitable casting technique for manufacturing of: 4 **03**  
     1) Milling machine Bed  
     2) Ingots  
     3) Carburetor body  
     4) Art castings
- Q.4** a) What is 'MMAW' process of welding? Explain its working with applications. **06**  
 b) Differentiate clearly between Brazing and Soldering. **05**  
 c) Write a note on "Resistance welding". **03**

**Section – II**

- Q.5** a) What is rapid prototyping? Explain in brief basic principle and classification of RP. **06**  
 b) Classify the advance forming processes. Explain in brief about two advance forming processes. **05**  
 c) With neat sketch explain the process of wire drawing. **03**
- Q.6** a) Explain with neat sketch direct and indirect extrusion. **06**  
 b) How to classify conventional forming process. Explain with neat sketch upset forging process. **05**  
 c) With neat sketch explain the process of tube drawing. **03**
- Q.7** a) What do you know about open die and close die forging? Explain with a neat sketch. **06**  
 b) Write a short note on types of rolling mills. **05**  
 c) Explain with nice diagram high energy rate forming process. **03**

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Processes**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 A) Choose the correct alternatives from the options.**

**14**

- 1) Higher ramming density gives\_ to mould
  - a) Good collapsibility
  - b) Low Permeability
  - c) Low Strength
  - d) High Permeability
- 2) Which is incorrect statement about results of hot working
  - a) Annealing operation is not necessary
  - b) Power requirements are low
  - c) Surface finish is good
  - d) Grain refinement is possible
- 3) In \_\_\_\_\_ process wastage of material is high.
  - a) Casting
  - b) Forming
  - c) Machining
  - d) Welding
- 4) In sand molding, the middle part of joining two flask is called
  - a) Coupe
  - b) Parting line
  - c) Drag
  - d) Flask-middle
- 5) Casting process is preferred for parts having \_\_\_\_\_.
  - a) A few details
  - b) Many details
  - c) No details
  - d) Non-symmetrical shape
- 6) For mounting several patterns at a time, following type of pattern is used
  - a) Combined pattern
  - b) Loose piece pattern
  - c) Sweep pattern
  - d) Match plate pattern
- 7) Draft on pattern for casting is
  - a) Shrinkage allowance
  - b) Identification number marked on it
  - c) Taper to facilitate its removal from mould
  - d) Increase in size of cavity due shaking of pattern
- 8) Which if the following materials has more shrinkage allowance
  - a) Cast iron
  - b) Brass
  - c) Lead
  - d) Aluminum alloy

**B) MCQ with more than one answer correct:**

06

02

- 1) Which of the following material cannot be forged?
  - a) white iron
  - b) cast iron
  - c) mild steel
  - d) high carbon steel
- 2) Which one of the following is an advantage of forging?
  - a) good surface finish
  - b) low tooling cost
  - c) open tolerance
  - d) improved physical property
- 3) External screw threads can be produced by
  - a) Milling
  - b) Pressing
  - c) Forging
  - d) Rolling

02

02

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S

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Processes**

Day &amp; Date: Friday, 17-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Answer any two full questions from each Section.  
 2) Figures to the right indicate full marks.  
 3) Make suitable assumptions, if required and state them clearly.

**Section – I**

- Q.2** a) Write the basic steps in casting process. What are the advantages and limitations of sand casting? **06**  
 b) Write different stages in core making. What do you understand by core setting? **05**  
 c) Differentiate clearly between Open riser and Blind riser. **03**
- Q.3** a) Enlist different types of core boxes. Explain any two core boxes in detail. **06**  
 b) Explain advantages and limitations of shell molding process. **05**  
 c) Suggest the suitable casting technique for manufacturing of: 4 **03**  
     1) Milling machine Bed  
     2) Ingots  
     3) Carburetor body  
     4) Art castings
- Q.4** a) What is 'MMAW' process of welding? Explain its working with applications. **06**  
 b) Differentiate clearly between Brazing and Soldering. **05**  
 c) Write a note on "Resistance welding". **03**

**Section – II**

- Q.5** a) What is rapid prototyping? Explain in brief basic principle and classification of RP. **06**  
 b) Classify the advance forming processes. Explain in brief about two advance forming processes. **05**  
 c) With neat sketch explain the process of wire drawing. **03**
- Q.6** a) Explain with neat sketch direct and indirect extrusion. **06**  
 b) How to classify conventional forming process. Explain with neat sketch upset forging process. **05**  
 c) With neat sketch explain the process of tube drawing. **03**
- Q.7** a) What do you know about open die and close die forging? Explain with a neat sketch. **06**  
 b) Write a short note on types of rolling mills. **05**  
 c) Explain with nice diagram high energy rate forming process. **03**

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Drawing & CAD**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 06:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14


**Q.1 Choose the correct alternatives from the options.**

**Type – I : Straight Objective Type / classical MCQ (Each bit one Mark each).**

**05**

- 1) Welding Produce a \_\_\_\_\_ Joint.
 

|                   |                      |
|-------------------|----------------------|
| a) Temporary      | b) Permanent         |
| c) Semi-permanent | d) None of the above |
- 2) This is the symbol for internal thread geometry.
 



|         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|
- 3) Angle of buttress thread is \_\_\_\_\_ degrees.
 

|        |        |
|--------|--------|
| a) 90° | b) 50° |
| c) 45° | d) 29° |
- 4) An Oldham's coupling connects two shafts, when they are \_\_\_\_\_.
 

|                 |             |
|-----------------|-------------|
| a) Intersecting | b) Parallel |
| c) Co-axial     | d) All      |
- 5)  $\phi 78^{+0.75}$  is the example of unilateral tolerance type.
 

|            |              |
|------------|--------------|
| a) Correct | b) Incorrect |
|------------|--------------|

**Type-2 Correct or Incorrect (Attempt any two) (Each bit One Mark each).**

**02**

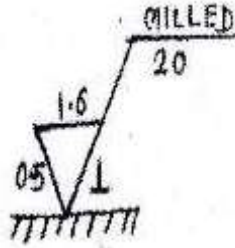
- 1) A hole whose lower deviation is zero is called as basic hole.
- 2) The Size of A4 sheet is  $297 \times 420$ .
- 3) The size across flats in hexagonal nut is 2D.



**Type -3 Multiple correct answer type. (Solve any two) (Each correct bit 2 mark)**

04

1) In the figure shown the value 0.5 indicates.



- |                        |                     |
|------------------------|---------------------|
| a) Machining allowance | b) Roughness value  |
| c) Sampling length     | d) Direction of lay |

2)  Represents \_\_\_\_\_ section.

- |            |             |
|------------|-------------|
| a) Full    | b) Half     |
| c) Partial | d) Revolved |

3) \_\_\_\_\_ is the example of sunk key.

- |                    |                      |
|--------------------|----------------------|
| a) Woodruff key    | b) GIB headed key    |
| c) Flat saddle key | d) Hollow saddle key |





**Type -4 Match the pairs (One marks for each correct answer)**

03

**Geometric Tolerances**

**Symbol**

- 1) Simple Run Out
- 2) Circularity
- 3) Cylindricity

- a) 
- b) 
- c) 
- d) 

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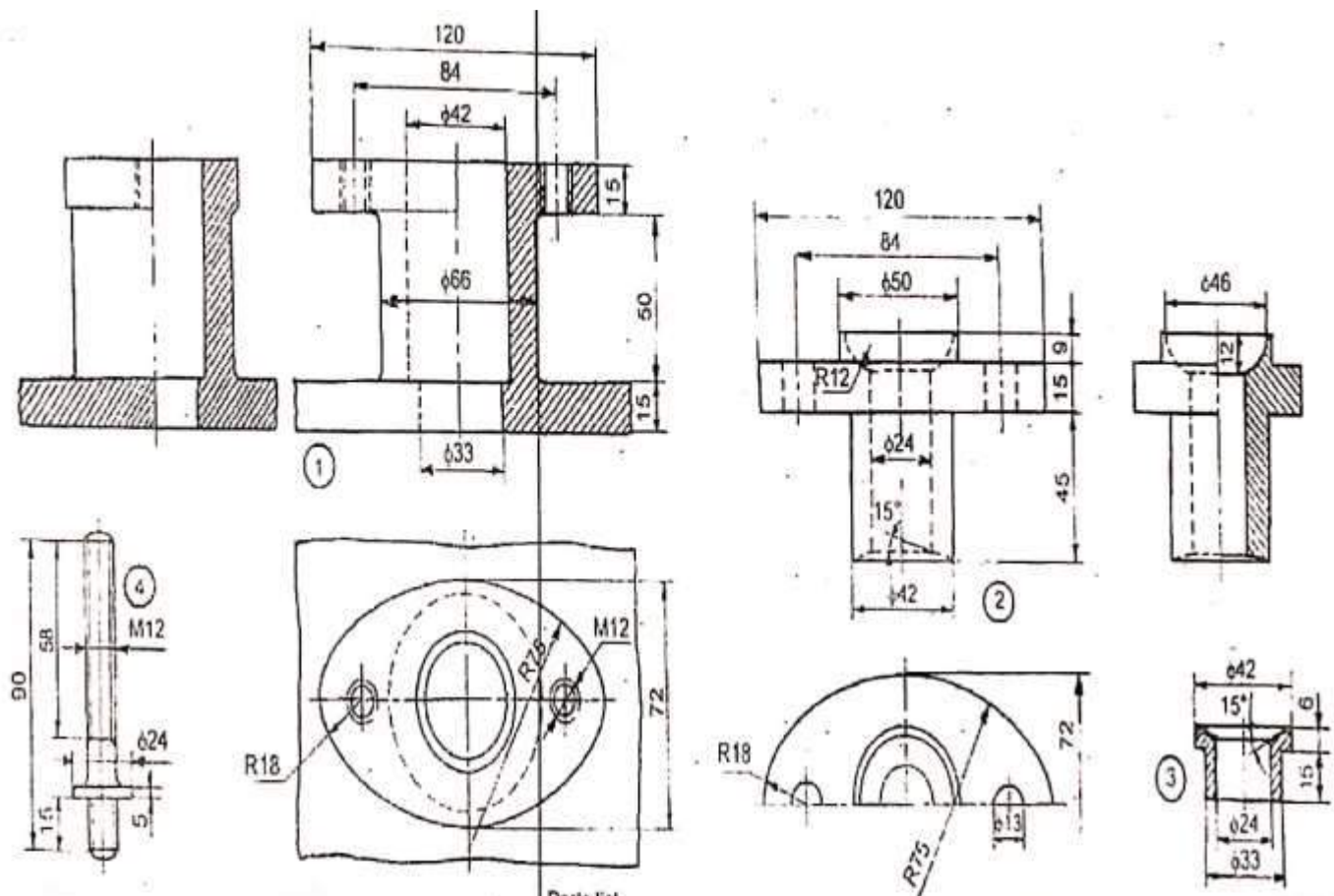
**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Drawing & CAD**

Day & Date: Monday, 20-03-2023  
Time: 02:00 PM To 06:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Figure No. 1 Shows the Details of Stuffing Box. Assemble given parts and 22**  
**Draw:**  
1) Front View  
2) Top View  
Prepare the List of Material and give the entire dimension.



Parts list

| Part No. | Name     | Matl  | Qty |
|----------|----------|-------|-----|
| 1        | Body     | CI    | 1   |
| 2        | Gland    | Brass | 1   |
| 3        | Bush     | Brass | 1   |
| 4        | Stud     | MS    | 2   |
| 5        | Nut, M12 | MS    | 2   |

Figure 1;

08

**Q.3 Solve any Four out of five. (Every bit has 02 marks).****a) Draw the BIS Convention of**

- 1) Cylindrical Tension Spring
- 2) Spur Gear
- 3) Single V Butt Weld
- 4) Diamond Knurling
- 5) Packing and Insulating Material

**b) Freehand sketching for the Following (Any One)**

- 1) Cotter Joint
- 2) Rag Foundation Bolt

05

**Q.4 a) Draw the BIS Convention for Following (Any Two)**

04

- 1) Full Section
- 2) External Threading
- 3) Splined Shaft

**b) Draw the Freehand Sketching for the Following (Any One).**

06

- 1) Fast and Lose Pulley
- 2) Single Riveted Double Strap Butt Joint

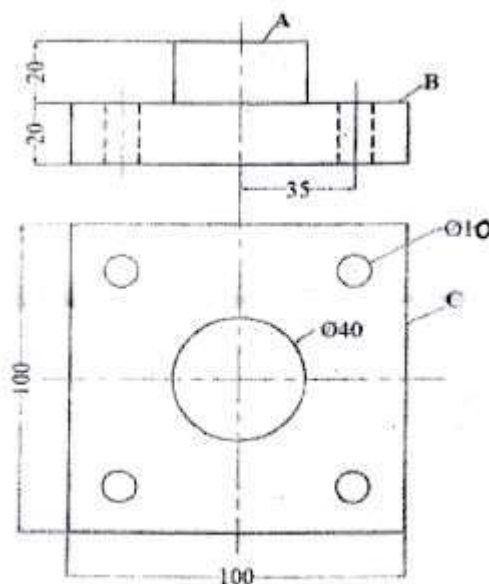
**Q.5 Solve the Following****a) Draw the Shaft basis system and Hole Basis System.**

04

**b) Redraw the Given Figure No.2 and Indicate the Mentioned parameters on it.**

07

- 1) Surface B is to be milled with Ra value of 15 microns, direction of lay parallel to plane of projection with sampling length 3 mm and machining allowance 1 mm. Show this content proper symbol in figure.
- 2) Surface B and A are parallel is within 0.01mm.
- 3) Axis of 40 extensions is perpendicular to B within 0.03 mm.



FigureNo-2

|                 |  |
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| <b>Seat No.</b> |  |
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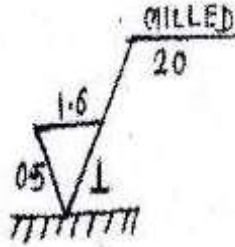
**Type -3 Multiple correct answer type. (Solve any two) (Each correct bit 2 mark)**

04

1) \_\_\_\_\_ is the example of sunk key.

- |                    |                      |
|--------------------|----------------------|
| a) Woodruff key    | b) GIB headed key    |
| c) Flat saddle key | d) Hollow saddle key |

2) In the figure shown the value 0.5 indicates.



- |                        |                     |
|------------------------|---------------------|
| a) Machining allowance | b) Roughness value  |
| c) Sampling length     | d) Direction of lay |

3)  Represents \_\_\_\_\_ section.

- |            |             |
|------------|-------------|
| a) Full    | b) Half     |
| c) Partial | d) Revolved |





**Type -4 Match the pairs (One marks for each correct answer)**

03

**Geometric Tolerances**

**Symbol**

- 1) Simple Run Out
- 2) Circularity
- 3) Cylindricity

- |                                                                                         |
|-----------------------------------------------------------------------------------------|
| a)  |
| b)  |
| c)  |
| d)  |

|                     |  |
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| <b>Seat<br/>No.</b> |  |
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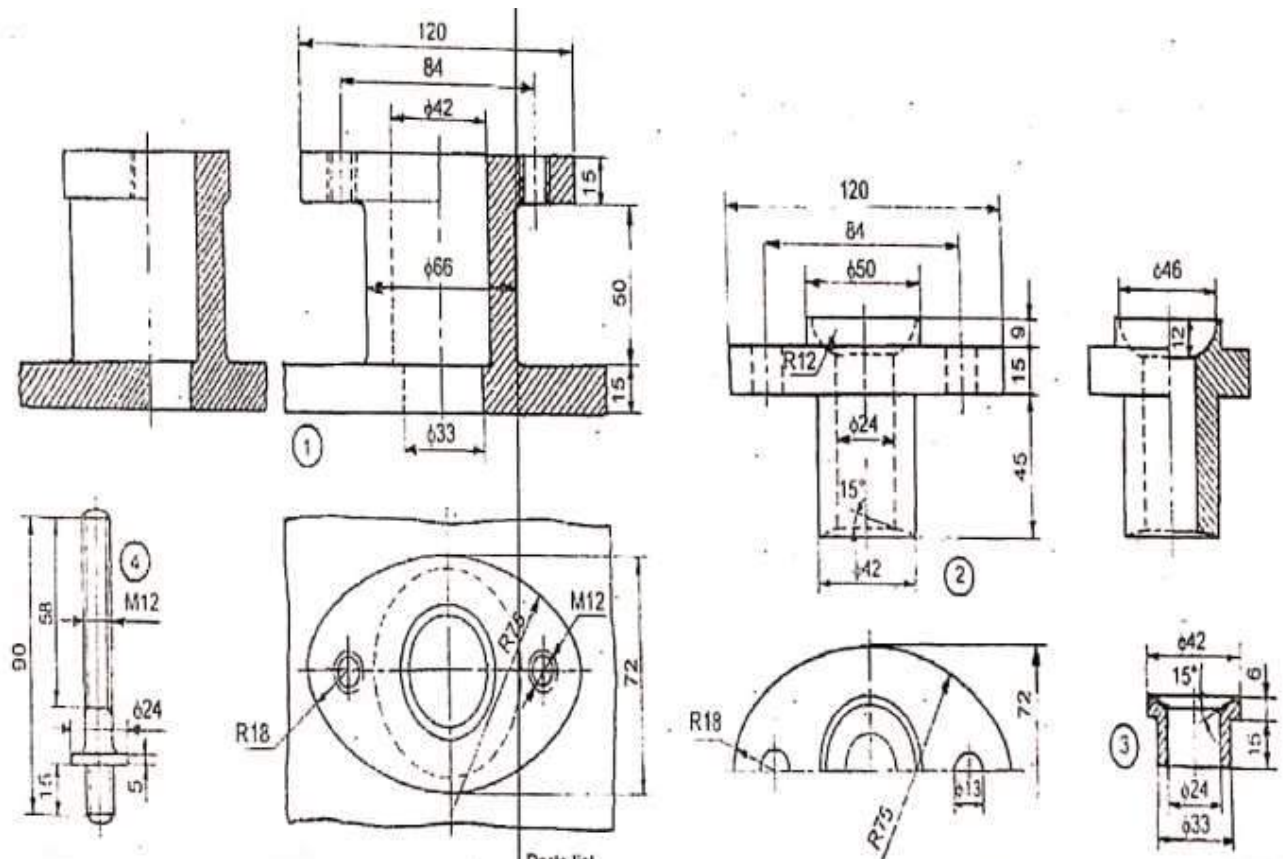
**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Drawing & CAD**

Day & Date: Monday, 20-03-2023  
Time: 02:00 PM To 06:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Figure No. 1 Shows the Details of Stuffing Box. Assemble given parts and 22**  
**Draw:**  
1) Front View  
2) Top View  
Prepare the List of Material and give the entire dimension.



Parts list

| Part No. | Name     | Matl  | Qty |
|----------|----------|-------|-----|
| 1        | Body     | CI    | 1   |
| 2        | Gland    | Brass | 1   |
| 3        | Bush     | Brass | 1   |
| 4        | Stud     | MS    | 2   |
| 5        | Nut, M12 | MS    | 2   |

Figure 1:



**Q.3 Solve any Four out of five. (Every bit has 02 marks).**

**a) Draw the BIS Convention of**

- 1) Cylindrical Tension Spring
- 2) Spur Gear
- 3) Single V Butt Weld
- 4) Diamond Knurling
- 5) Packing and Insulating Material

**b) Freehand sketching for the Following (Any One)**

- 1) Cotter Joint
- 2) Rag Foundation Bolt

05

**Q.4 a) Draw the BIS Convention for Following (Any Two)**

- 1) Full Section
- 2) External Threading
- 3) Splined Shaft

04

**b) Draw the Freehand Sketching for the Following (Any One).**

- 1) Fast and Lose Pulley
- 2) Single Riveted Double Strap Butt Joint

06

**Q.5 Solve the Following**

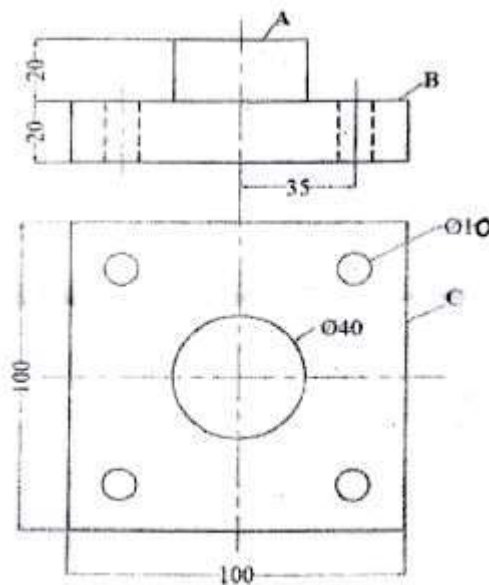
**a) Draw the Shaft basis system and Hole Basis System.**

04

**b) Redraw the Given Figure No.2 and Indicate the Mentioned parameters on it.**

07

- 1) Surface B is to be milled with Ra value of 15 microns, direction of lay parallel to plane of projection with sampling length 3 mm and machining allowance 1 mm. Show this content proper symbol in figure.
- 2) Surface B and A are parallel is within 0.01mm.
- 3) Axis of 40 extensions is perpendicular to B within 0.03 mm.



FigureNo-2

**Seat  
No.**

Day & Date: Monday, 20-03-2023  
Time: 02:00 PM To 06:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**Type – I : Straight Objective Type / classical MCQ (Each bit one Mark each).**

05

1) This is the symbol for internal thread geometry.



- a) True                                                  b) False
- 2) Angle of buttress thread is \_\_\_\_\_ degrees.  
a) 90°                                                  b) 50°  
c) 45°                                                  d) 29°
- 3) An Oldham's coupling connects two shafts, when they are \_\_\_\_\_.  
a) Intersecting                                      b) Parallel  
c) Co-axial                                          d) All
- 4)  $\phi 78^{+0.75}$  is the example of unilateral tolerance type.  
a) Correct                                              b) Incorrect
- 5) Welding Produce a \_\_\_\_\_ Joint.  
a) Temporary                                        b) Permanent  
c) Semi-permanent                                d) None of the above

**Type-2 Correct or Incorrect (Attempt any two) (Each bit One Mark each).**

02

- 1) The Size of A4 sheet is  $297 \times 420$ .
- 2) The size across flats in hexagonal nut is 2D.
- 3) A hole whose lower deviation is zero is called as basic hole.

**Type -3 Multiple correct answer type. (Solve any two) (Each correct bit 2 mark)**

04

1)  Represents \_\_\_\_\_ section.

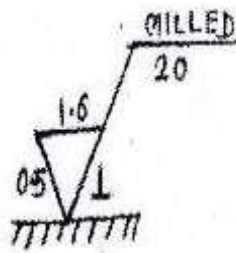


- a) Full                      b) Half  
c) Partial                d) Revolved

2) \_\_\_\_\_ is the example of sunk key.

- a) Woodruff key                      b) GIB headed key  
c) Flat saddle key                  d) Hollow saddle key

**3)** In the figure shown the value 0.5 indicates.



- a) Machining allowance                      b) Roughness value  
c) Sampling length                            d) Direction of lay





**Type -4 Match the pairs (One marks for each correct answer)**

## 03

## Geometric Tolerances

### Symbol

- 1) Simple Run Out
- 2) Circularity
- 3) Cylindricity

- a) 
- b) 
- c) 
- d) 

**SLR-HL-432**

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Drawing & CAD**

Day & Date: Monday, 20-03-2023  
Time: 02:00 PM To 06:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Figure No. 1 Shows the Details of Stuffing Box. Assemble given parts and Draw: 22**

- 1) Front View
- 2) Top View

Prepare the List of Material and give the entire dimension.

Set 

|   |
|---|
| R |
|---|



| Part No. | Name     | Matl  | Qty |
|----------|----------|-------|-----|
| 1        | Body     | CI    | 1   |
| 2        | Gland    | Brass | 1   |
| 3        | Bush     | Brass | 1   |
| 4        | Stud     | MS    | 2   |
| 5        | Nut, M12 | MS    | 2   |

Page 14 of 20

**Q.3 Solve any Four out of five. (Every bit has 02 marks).**

**a) Draw the BIS Convention of**

- 1) Cylindrical Tension Spring
- 2) Spur Gear
- 3) Single V Butt Weld
- 4) Diamond Knurling
- 5) Packing and Insulating Material

**b) Freehand sketching for the Following (Any One)**

- 1) Cotter Joint
- 2) Rag Foundation Bolt

05

**Q.4 a) Draw the BIS Convention for Following (Any Two)**

- 1) Full Section
- 2) External Threading
- 3) Splined Shaft

04

**b) Draw the Freehand Sketching for the Following (Any One).**

- 1) Fast and Lose Pulley
- 2) Single Riveted Double Strap Butt Joint

06

**Q.5 Solve the Following**

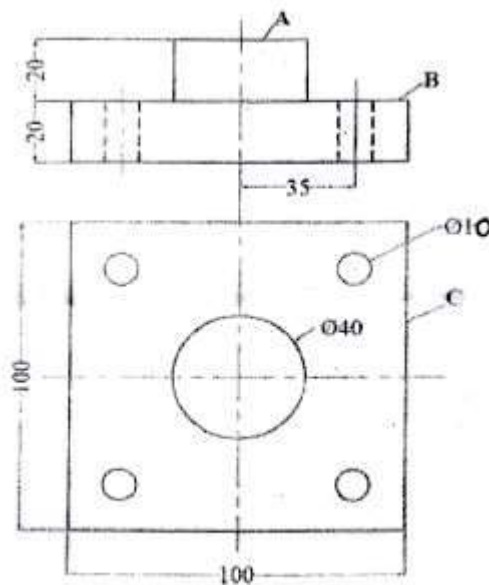
**a) Draw the Shaft basis system and Hole Basis System.**

04

**b) Redraw the Given Figure No.2 and Indicate the Mentioned parameters on it.**

07

- 1) Surface B is to be milled with Ra value of 15 microns, direction of lay parallel to plane of projection with sampling length 3 mm and machining allowance 1 mm. Show this content proper symbol in figure.
- 2) Surface B and A are parallel is within 0.01mm.
- 3) Axis of 40 extensions is perpendicular to B within 0.03 mm.



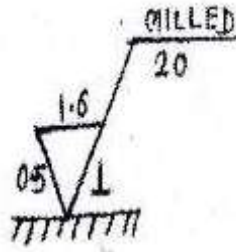
FigureNo-2

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**Type -3 Multiple correct answer type. (Solve any two) (Each correct bit 2 mark)**

04

- 1) In the figure shown the value 0.5 indicates.



- |                        |                     |
|------------------------|---------------------|
| a) Machining allowance | b) Roughness value  |
| c) Sampling length     | d) Direction of lay |

- 2)  Represents \_\_\_\_\_ section.

- |            |             |
|------------|-------------|
| a) Full    | b) Half     |
| c) Partial | d) Revolved |

- 3) \_\_\_\_\_ is the example of sunk key.

- |                    |                      |
|--------------------|----------------------|
| a) Woodruff key    | b) GIB headed key    |
| c) Flat saddle key | d) Hollow saddle key |

**Type -4 Match the pairs (One marks for each correct answer)**

03

**Geometric Tolerances**

**Symbol**

- 1) Simple Run Out

- a) 

- 2) Circularity

- b) 

- 3) Cylindricity

- c) 

- d) 



**SLR-HL-432**

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| <b>Set</b> | <b>S</b> |
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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Machine Drawing & CAD**

Day & Date: Monday, 20-03-2023  
Time: 02:00 PM To 06:00 PM

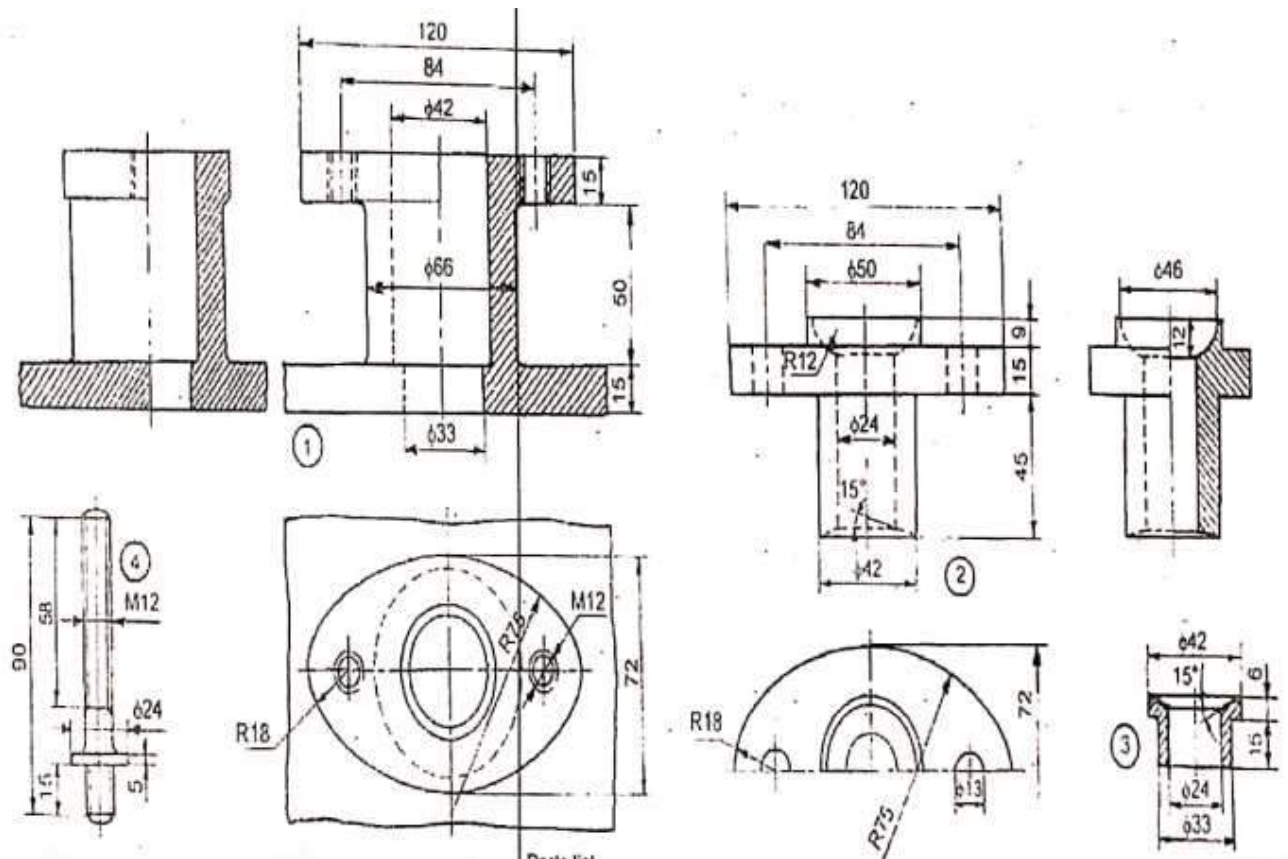
Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Q.2 Figure No. 1 Shows the Details of Stuffing Box. Assemble given parts and 22**  
**Draw:**

- 1) Front View
- 2) Top View

Prepare the List of Material and give the entire dimension.



Parts list

| Part No. | Name     | Matl  | Qty |
|----------|----------|-------|-----|
| 1        | Body     | CI    | 1   |
| 2        | Gland    | Brass | 1   |
| 3        | Bush     | Brass | 1   |
| 4        | Stud     | MS    | 2   |
| 5        | Nut, M12 | MS    | 2   |

Figure 1:

**Q.3 Solve any Four out of five. (Every bit has 02 marks).**

**08**

**a) Draw the BIS Convention of**

- 1) Cylindrical Tension Spring
- 2) Spur Gear
- 3) Single V Butt Weld
- 4) Diamond Knurling
- 5) Packing and Insulating Material

**b) Freehand sketching for the Following (Any One)**

**05**

- 1) Cotter Joint
- 2) Rag Foundation Bolt

**Q.4 a) Draw the BIS Convention for Following (Any Two)**

**04**

- 1) Full Section
- 2) External Threading
- 3) Splined Shaft

**b) Draw the Freehand Sketching for the Following (Any One).**

**06**

- 1) Fast and Lose Pulley
- 2) Single Riveted Double Strap Butt Joint

**Q.5 Solve the Following**

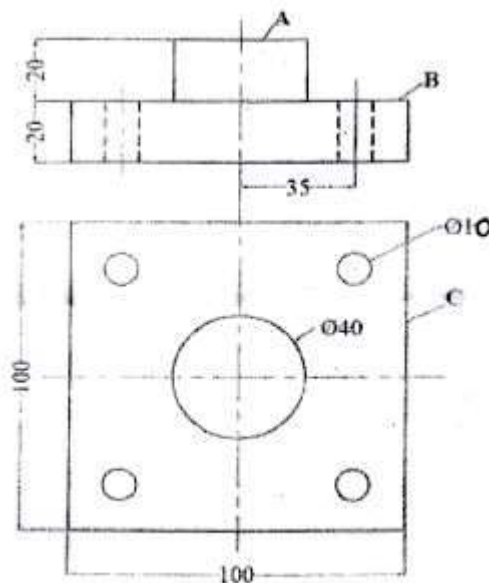
**a) Draw the Shaft basis system and Hole Basis System.**

**04**

**b) Redraw the Given Figure No.2 and Indicate the Mentioned parameters on it.**

**07**

- 1) Surface B is to be milled with Ra value of 15 microns, direction of lay parallel to plane of projection with sampling length 3 mm and machining allowance 1 mm. Show this content proper symbol in figure.
- 2) Surface B and A are parallel is within 0.01mm.
- 3) Axis of 40 extensions is perpendicular to B within 0.03 mm.



FigureNo-2

|                 |  |
|-----------------|--|
| <b>Seat No.</b> |  |
|-----------------|--|

## Max. Marks: 70

Marks: 14

14

- Page 1 of 12

- 9) If the bore of an engine is 83 mm and stroke is 90 mm and rotation speed is 4000 rpm, then the mean piston speed is \_\_\_\_\_.
  - a) 10 m/s
  - b) 15 m/s
  - c) 12 m/s
  - d) 14 m/s
- 10) Ignition quality of diesel depends upon \_\_\_\_\_.
  - a) flash point
  - b) octane number
  - c) cetane number
  - d) HUCR
- 11) The centrifugal type super charger is preferred at \_\_\_\_\_.
  - a) low speeds
  - b) high speeds
  - c) high pressure
  - d) all the above
- 12) Single point fuel injection in SI engines is \_\_\_\_\_.
  - a) throttle body injection
  - b) port injection
  - c) direct injection
  - d) both b) and c)
- 13) Incomplete combustion in SI engines is indicated by \_\_\_\_\_.
  - a) high percentage of carbon monoxide
  - b) high percentage of carbon dioxide
  - c) high percentage of NOx
  - d) low percentage of NOx
- 14) The thermal efficiency of large diesel engines is in the range of \_\_\_\_\_.
  - a) 10 to 20 percent
  - b) 20 to 30 percent
  - c) 35 to 50 percent
  - d) 50 to 100 percent

|          |  |
|----------|--|
| Seat No. |  |
|----------|--|

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P

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Internal Combustion Engines**

Day &amp; Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Use university graph paper & semi-log paper if required.

**Section – I**

- Q.2** a) Why does the efficiency of the fuel air cycle differ from that of the actual cycle? **05**  
 b) What do you understand by the term carburetion? Sketch the complete carburetor including all its sub-systems. **05**  
 c) What is turbo charging? Explain the different types of supercharging. **04**
- Q.3** a) Explain requirements of fuel injection system for C I Engines. **05**  
 b) Compare 2S and 4S internal combustion engines. **05**  
 c) Explain thermodynamic cycle of supercharged engines. **04**
- Q.4** a) Derive an equation for air fuel ratio for carburetor by using approximate analysis method. **05**  
 b) Enlist types of injector nozzles used in engines and explain CRDI system with neat sketch. **05**  
 c) Explain compensating devices in carburetor. Explain any one compensating system with neat sketch. **04**

**Section – II**

- Q.5** a) Discuss the phenomenon of knock or detonation in SI engines. **05**  
 b) Explain with the help of sketch the combustion process in a CI engine. **05**  
 c) What is exhaust gas recirculation? How does it help in reducing NOx emissions? **04**
- Q.6** a) What is the importance of flame speed in combustion in SI engines? Discuss the engine variables on which flame speed depends. **05**  
 b) What do you understand by the term's octane number, cetane number and HUCR? **05**  
 c) Explain Heat Balance Sheet in detail. **04**
- Q.7** a) Explain any three factors affecting knock in CI engines. **05**  
 b) Discuss the suitability of biogas as an alternative fuel. **04**  
 c) Following particulars were obtained in a trial of 4 S single cylinder gas engine conducted for 1 hour. **05**  
 Revolution = 16000 rph                      Missed cycles = 600  
 Net brake load = 1600 N                      Brake circumference = 4 m  
 Mean effective pressure = 8 bar              Gas consumption = 22000 liter  
 Calorific value of gas = 20 KJ/Lit  
 Take,  $d = 25$  cm,  $L = 40$  cm,  $R_c = 6.5$  for the engine. Find: IP, BP, Mechanical Efficiency.

|          |  |
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| Set Q |
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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Internal Combustion Engines**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not a compensation device of a carburetor?
 

|                    |                  |
|--------------------|------------------|
| a) auxiliary valve | b) emulsion tube |
| c) bypass valve    | d) choke         |
- 2) If the bore of an engine is 83 mm and stroke is 90 mm and rotation speed is 4000 rpm, then the mean piston speed is \_\_\_\_\_.
 

|           |           |
|-----------|-----------|
| a) 10 m/s | b) 15 m/s |
| c) 12 m/s | d) 14 m/s |
- 3) Ignition quality of diesel depends upon \_\_\_\_\_.
 

|                  |                  |
|------------------|------------------|
| a) flash point   | b) octane number |
| c) cetane number | d) HUCR          |
- 4) The centrifugal type super charger is preferred at \_\_\_\_\_.
 

|                  |                  |
|------------------|------------------|
| a) low speeds    | b) high speeds   |
| c) high pressure | d) all the above |
- 5) Single point fuel injection in SI engines is \_\_\_\_\_.
 

|                            |                   |
|----------------------------|-------------------|
| a) throttle body injection | b) port injection |
| c) direct injection        | d) both b) and c) |
- 6) Incomplete combustion in SI engines is indicated by \_\_\_\_\_.
 

|                                       |
|---------------------------------------|
| a) high percentage of carbon monoxide |
| b) high percentage of carbon dioxide  |
| c) high percentage of NOx             |
| d) low percentage of NOx              |
- 7) The thermal efficiency of large diesel engines is in the range of \_\_\_\_\_.
 

|                     |                      |
|---------------------|----------------------|
| a) 10 to 20 percent | b) 20 to 30 percent  |
| c) 35 to 50 percent | d) 50 to 100 percent |
- 8) The most likely range of compression ratio for modern day spark ignition engines is \_\_\_\_\_.
 

|            |             |
|------------|-------------|
| a) 5 to 8  | b) 12 to 16 |
| c) 8 to 12 | d) 16 to 22 |

- 9) Which part of the petrol engine needs to be modified if it is to be run on LPG?
  - a) Piston
  - b) Crankshaft
  - c) Valves
  - d) Carburetor
- 10) Friction power of an internal combustion engine increases with the increase in \_\_\_\_\_.
  - a) Speed
  - b) brake power
  - c) indicated power
  - d) fuel flow
- 11) The primary advantage of the pintaux nozzle is \_\_\_\_\_.
  - a) good fuel distribution
  - b) good atomization
  - c) good penetration
  - d) good cold starting performance
- 12) Octane number of alcohol is \_\_\_\_\_.
  - a) 0
  - b) 100
  - c) > 100
  - d) 50
- 13) The NO<sub>x</sub> emission in SI engines is highest when the mixture is \_\_\_\_\_.
  - a) rich
  - b) lean
  - c) stoichiometric
  - d) very rich
- 14) In SI engines with an increase in compression ratio the tendency to detonate \_\_\_\_\_.
  - a) increases
  - b) does not change
  - c) decreases
  - d) none of the above



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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Internal Combustion Engines**

Day &amp; Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Use university graph paper & semi-log paper if required.

**Section – I**

- Q.2** a) Why does the efficiency of the fuel air cycle differ from that of the actual cycle? **05**  
 b) What do you understand by the term carburetion? Sketch the complete carburetor including all its sub-systems. **05**  
 c) What is turbo charging? Explain the different types of supercharging. **04**
- Q.3** a) Explain requirements of fuel injection system for C I Engines. **05**  
 b) Compare 2S and 4S internal combustion engines. **05**  
 c) Explain thermodynamic cycle of supercharged engines. **04**
- Q.4** a) Derive an equation for air fuel ratio for carburetor by using approximate analysis method. **05**  
 b) Enlist types of injector nozzles used in engines and explain CRDI system with neat sketch. **05**  
 c) Explain compensating devices in carburetor. Explain any one compensating system with neat sketch. **04**

**Section – II**

- Q.5** a) Discuss the phenomenon of knock or detonation in SI engines. **05**  
 b) Explain with the help of sketch the combustion process in a CI engine. **05**  
 c) What is exhaust gas recirculation? How does it help in reducing NOx emissions? **04**
- Q.6** a) What is the importance of flame speed in combustion in SI engines? Discuss the engine variables on which flame speed depends. **05**  
 b) What do you understand by the term's octane number, cetane number and HUCR? **05**  
 c) Explain Heat Balance Sheet in detail. **04**
- Q.7** a) Explain any three factors affecting knock in CI engines. **05**  
 b) Discuss the suitability of biogas as an alternative fuel. **04**  
 c) Following particulars were obtained in a trial of 4 S single cylinder gas engine conducted for 1 hour. **05**  
 Revolution = 16000 rph                      Missed cycles = 600  
 Net brake load = 1600 N                      Brake circumference = 4 m  
 Mean effective pressure = 8 bar              Gas consumption = 22000 liter  
 Calorific value of gas = 20 KJ/Lit  
 Take,  $d = 25$  cm,  $L = 40$  cm,  $R_c = 6.5$  for the engine. Find: IP, BP, Mechanical Efficiency.

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Max. Marks: 70

Marks: 14

14

- Page 7 of 12

- 9) Octane number of alcohol is \_\_\_\_\_.  
a) 0  
b) 100  
c) > 100  
d) 50
- 10) The NO<sub>x</sub> emission in SI engines is highest when the mixture is \_\_\_\_\_.  
a) rich  
b) lean  
c) stoichiometric  
d) very rich
- 11) In SI engines with an increase in compression ratio the tendency to detonate \_\_\_\_\_.  
a) increases  
b) does not change  
c) decreases  
d) none of the above
- 12) Which of the following is not a compensation device of a carburetor?  
a) auxiliary valve  
b) emulsion tube  
c) bypass valve  
d) choke
- 13) If the bore of an engine is 83 mm and stroke is 90 mm and rotation speed is 4000 rpm, then the mean piston speed is \_\_\_\_\_.  
a) 10 m/s  
b) 15 m/s  
c) 12 m/s  
d) 14 m/s
- 14) Ignition quality of diesel depends upon \_\_\_\_\_.  
a) flash point  
b) octane number  
c) cetane number  
d) HUCR

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Set **R**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Internal Combustion Engines**

Day &amp; Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Use university graph paper & semi-log paper if required.

**Section – I**

- Q.2** a) Why does the efficiency of the fuel air cycle differ from that of the actual cycle? **05**  
 b) What do you understand by the term carburetion? Sketch the complete carburetor including all its sub-systems. **05**  
 c) What is turbo charging? Explain the different types of supercharging. **04**
- Q.3** a) Explain requirements of fuel injection system for C I Engines. **05**  
 b) Compare 2S and 4S internal combustion engines. **05**  
 c) Explain thermodynamic cycle of supercharged engines. **04**
- Q.4** a) Derive an equation for air fuel ratio for carburetor by using approximate analysis method. **05**  
 b) Enlist types of injector nozzles used in engines and explain CRDI system with neat sketch. **05**  
 c) Explain compensating devices in carburetor. Explain any one compensating system with neat sketch. **04**

**Section – II**

- Q.5** a) Discuss the phenomenon of knock or detonation in SI engines. **05**  
 b) Explain with the help of sketch the combustion process in a CI engine. **05**  
 c) What is exhaust gas recirculation? How does it help in reducing NOx emissions? **04**
- Q.6** a) What is the importance of flame speed in combustion in SI engines? Discuss the engine variables on which flame speed depends. **05**  
 b) What do you understand by the term's octane number, cetane number and HUCR? **05**  
 c) Explain Heat Balance Sheet in detail. **04**
- Q.7** a) Explain any three factors affecting knock in CI engines. **05**  
 b) Discuss the suitability of biogas as an alternative fuel. **04**  
 c) Following particulars were obtained in a trial of 4 S single cylinder gas engine conducted for 1 hour. **05**  
 Revolution = 16000 rph                      Missed cycles = 600  
 Net brake load = 1600 N                      Brake circumference = 4 m  
 Mean effective pressure = 8 bar              Gas consumption = 22000 liter  
 Calorific value of gas = 20 KJ/Lit  
 Take,  $d = 25$  cm,  $L = 40$  cm,  $R_c = 6.5$  for the engine. Find: IP, BP, Mechanical Efficiency.

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## Internal Combustion Engines

Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 10 of 12

- 9) The thermal efficiency of large diesel engines is in the range of \_\_\_\_\_.  
a) 10 to 20 percent                      b) 20 to 30 percent  
c) 35 to 50 percent                      d) 50 to 100 percent
- 10) The most likely range of compression ratio for modern day spark ignition engines is \_\_\_\_\_.  
a) 5 to 8                                      b) 12 to 16  
c) 8 to 12                                      d) 16 to 22
- 11) Which part of the petrol engine needs to be modified if it is to be run on LPG?  
a) Piston                                      b) Crankshaft  
c) Valves                                      d) Carburetor
- 12) Friction power of an internal combustion engine increases with the increase in \_\_\_\_\_.  
a) Speed                                      b) brake power  
c) indicated power                      d) fuel flow
- 13) The primary advantage of the pintaux nozzle is \_\_\_\_\_.  
a) good fuel distribution                      b) good atomization  
c) good penetration                      d) good cold starting performance
- 14) Octane number of alcohol is \_\_\_\_\_.  
a) 0                                              b) 100  
c) > 100                                      d) 50

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Set **S**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Internal Combustion Engines**

Day &amp; Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Use university graph paper & semi-log paper if required.

**Section – I**

- Q.2** a) Why does the efficiency of the fuel air cycle differ from that of the actual cycle? **05**  
 b) What do you understand by the term carburetion? Sketch the complete carburetor including all its sub-systems. **05**  
 c) What is turbo charging? Explain the different types of supercharging. **04**
- Q.3** a) Explain requirements of fuel injection system for C I Engines. **05**  
 b) Compare 2S and 4S internal combustion engines. **05**  
 c) Explain thermodynamic cycle of supercharged engines. **04**
- Q.4** a) Derive an equation for air fuel ratio for carburetor by using approximate analysis method. **05**  
 b) Enlist types of injector nozzles used in engines and explain CRDI system with neat sketch. **05**  
 c) Explain compensating devices in carburetor. Explain any one compensating system with neat sketch. **04**

**Section – II**

- Q.5** a) Discuss the phenomenon of knock or detonation in SI engines. **05**  
 b) Explain with the help of sketch the combustion process in a CI engine. **05**  
 c) What is exhaust gas recirculation? How does it help in reducing NOx emissions? **04**
- Q.6** a) What is the importance of flame speed in combustion in SI engines? Discuss the engine variables on which flame speed depends. **05**  
 b) What do you understand by the term's octane number, cetane number and HUCR? **05**  
 c) Explain Heat Balance Sheet in detail. **04**
- Q.7** a) Explain any three factors affecting knock in CI engines. **05**  
 b) Discuss the suitability of biogas as an alternative fuel. **04**  
 c) Following particulars were obtained in a trial of 4 S single cylinder gas engine conducted for 1 hour. **05**
- |                                                                                                  |                               |
|--------------------------------------------------------------------------------------------------|-------------------------------|
| Revolution = 16000 rph                                                                           | Missed cycles = 600           |
| Net brake load = 1600 N                                                                          | Brake circumference = 4 m     |
| Mean effective pressure = 8 bar                                                                  | Gas consumption = 22000 liter |
| Calorific value of gas = 20 KJ/Lit                                                               |                               |
| Take, $d = 25$ cm, $L = 40$ cm, $R_c = 6.5$ for the engine. Find: IP, BP, Mechanical Efficiency. |                               |

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- 10)** \_\_\_\_\_ is a single flat layer of unidirectional fibers or woven fibers arranged in a matrix.
- |             |           |
|-------------|-----------|
| a) Laminate | b) Layer  |
| c) Lamina   | d) Matrix |
- 11)** \_\_\_\_\_ is a stack of plies of composites, each layer can be laid at various orientations and can be made up of different material systems.
- |           |                  |
|-----------|------------------|
| a) Matrix | b) Laminate      |
| c) Layer  | d) none of these |
- 12)** \_\_\_\_\_ composites contain more than one fiber or one matrix system in a laminate.
- |           |                  |
|-----------|------------------|
| a) Hybrid | b) Laminate      |
| c) Layer  | d) none of these |
- 13)** \_\_\_\_\_ composite materials consist of the smallest size of reinforced in matrix.
- |                |                 |
|----------------|-----------------|
| a) Short fiber | b) Whisker      |
| c) Particulate | d) Monofilament |
- 14)** \_\_\_\_\_ composite materials consist of layers of at least two different materials that are bonded together.
- |                 |              |
|-----------------|--------------|
| a) Short fiber  | b) Whisker   |
| c) Monofilament | d) Laminated |

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Composite Material**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programable calculator is allowed.  
 4) Make suitable assumptions if necessary and state it clearly.

**Section – I**

- Q.2 Answer the following question.** **14**  
 a) Classify the composite material and describe in detail all types of composite materials.  
 b) Derive the stress-strain relation for monoclinic material in plane stress condition.
- Q.3 Answer the following question.** **14**  
 a) Describe Engineering Constants of an Angle Lamina.  
 b) Explain Hooke's Law for a Two-Dimensional Unidirectional Lamina.
- Q.4 Answer the following question.**  
 a) Write short note on Plane Stress Assumption. **04**  
 b) Explain recycling fiber-reinforced composites. **05**  
 c) Explain Transversely Isotropic Material. **05**

**Section – II**

- Q.5 Answer the following question.**  
 a) Describe filament winding process for composite material manufacturing. **05**  
 b) Explain the term Pultrusion. **05**  
 c) Describe the concept of volume and mass fractions. **04**
- Q.6 Answer the following question.**  
 a) Describe in detail the semi-empirical model. **06**  
 b) A glass/epoxy lamina consists of a 70% fiber volume fraction. Use properties of glass and epoxy ( $\rho_f = 2500 \text{ kg/m}^3$ ,  $\rho_m = 1200 \text{ kg/m}^3$ ). to determine the **08**  
     1) Density of lamina  
     2) Mass fractions of the glass and epoxy  
     3) Volume of composite lamina if the mass of the lamina is 4 kg
- Q.7 Answer the following question.**  
 a) Describe the concepts of Longitudinal Young's Modulus Transverse Young's Modulus. **05**  
 b) Describe the transverse Young's Modulus and Major Poisson's Ratio. **05**  
 c) Explain the effect of Void Content on composite material. **04**

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Composite Material**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programable calculator is allowed.  
 4) Make suitable assumptions if necessary and state it clearly.

**Section – I**

- Q.2 Answer the following question.** **14**  
 a) Classify the composite material and describe in detail all types of composite materials.  
 b) Derive the stress-strain relation for monoclinic material in plane stress condition.
- Q.3 Answer the following question.** **14**  
 a) Describe Engineering Constants of an Angle Lamina.  
 b) Explain Hooke's Law for a Two-Dimensional Unidirectional Lamina.
- Q.4 Answer the following question.**  
 a) Write short note on Plane Stress Assumption. **04**  
 b) Explain recycling fiber-reinforced composites. **05**  
 c) Explain Transversely Isotropic Material. **05**

**Section – II**

- Q.5 Answer the following question.**  
 a) Describe filament winding process for composite material manufacturing. **05**  
 b) Explain the term Pultrusion. **05**  
 c) Describe the concept of volume and mass fractions. **04**
- Q.6 Answer the following question.**  
 a) Describe in detail the semi-empirical model. **06**  
 b) A glass/epoxy lamina consists of a 70% fiber volume fraction. Use properties of glass and epoxy ( $\rho_f = 2500 \text{ kg/m}^3$ ,  $\rho_m = 1200 \text{ kg/m}^3$ ) to determine the **08**  
     1) Density of lamina  
     2) Mass fractions of the glass and epoxy  
     3) Volume of composite lamina if the mass of the lamina is 4 kg
- Q.7 Answer the following question.**  
 a) Describe the concepts of Longitudinal Young's Modulus Transverse Young's Modulus. **05**  
 b) Describe the transverse Young's Modulus and Major Poisson's Ratio. **05**  
 c) Explain the effect of Void Content on composite material. **04**

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Composite Material**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is a stack of plies of composites, each layer can be laid at various orientations and can be made up of different material systems.
 

|           |                  |
|-----------|------------------|
| a) Matrix | b) Laminate      |
| c) Layer  | d) none of these |
- 2) \_\_\_\_\_ composites contain more than one fiber or one matrix system in a laminate.
 

|           |                  |
|-----------|------------------|
| a) Hybrid | b) Laminate      |
| c) Layer  | d) none of these |
- 3) \_\_\_\_\_ composite materials consist of the smallest size of reinforced in matrix.
 

|                |                 |
|----------------|-----------------|
| a) Short fiber | b) Whisker      |
| c) Particulate | d) Monofilament |
- 4) \_\_\_\_\_ composite materials consist of layers of at least two different materials that are bonded together.
 

|                 |              |
|-----------------|--------------|
| a) Short fiber  | b) Whisker   |
| c) Monofilament | d) Laminated |
- 5) The protection of material ingredient is role of \_\_\_\_\_.
 

|                                  |                  |
|----------------------------------|------------------|
| a) matrix                        | b) reinforcement |
| c) both matrix and reinforcement | d) interphase    |
- 6) Carrying the load and supporting whole material is role of \_\_\_\_\_.
 

|                                  |                  |
|----------------------------------|------------------|
| a) matrix                        | b) reinforcement |
| c) both matrix and reinforcement | d) interphase    |
- 7) Composite material is made up of \_\_\_\_\_.
 

|                                  |                  |
|----------------------------------|------------------|
| a) matrix                        | b) reinforcement |
| c) both matrix and reinforcement | d) interphase    |
- 8) Following is the area of application of composite \_\_\_\_\_.
 

|              |                     |
|--------------|---------------------|
| a) defence   | b) marian           |
| c) aerospace | d) all of the above |

- Page 8 of 12

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| Set | R |
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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Composite Material**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programable calculator is allowed.  
 4) Make suitable assumptions if necessary and state it clearly.

**Section – I**

- Q.2 Answer the following question. 14**  
 a) Classify the composite material and describe in detail all types of composite materials.  
 b) Derive the stress-strain relation for monoclinic material in plane stress condition.
- Q.3 Answer the following question. 14**  
 a) Describe Engineering Constants of an Angle Lamina.  
 b) Explain Hooke's Law for a Two-Dimensional Unidirectional Lamina.
- Q.4 Answer the following question.**  
 a) Write short note on Plane Stress Assumption. **04**  
 b) Explain recycling fiber-reinforced composites. **05**  
 c) Explain Transversely Isotropic Material. **05**

**Section – II**

- Q.5 Answer the following question.**  
 a) Describe filament winding process for composite material manufacturing. **05**  
 b) Explain the term Pultrusion. **05**  
 c) Describe the concept of volume and mass fractions. **04**
- Q.6 Answer the following question.**  
 a) Describe in detail the semi-empirical model. **06**  
 b) A glass/epoxy lamina consists of a 70% fiber volume fraction. Use properties of glass and epoxy ( $\rho_f = 2500 \text{ kg/m}^3$ ,  $\rho_m = 1200 \text{ kg/m}^3$ ) to determine the **08**  
 1) Density of lamina  
 2) Mass fractions of the glass and epoxy  
 3) Volume of composite lamina if the mass of the lamina is 4 kg
- Q.7 Answer the following question.**  
 a) Describe the concepts of Longitudinal Young's Modulus Transverse Young's Modulus. **05**  
 b) Describe the transverse Young's Modulus and Major Poisson's Ratio. **05**  
 c) Explain the effect of Void Content on composite material. **04**



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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Composite Material**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ are a ready-made tape composed of filbers in a polymer matrix.
 

|              |            |
|--------------|------------|
| a) Polyester | b) Epoxy   |
| c) Prepregs  | d) Polymer |
- 2) Winding patterns includes \_\_\_\_\_.
 

|          |                 |
|----------|-----------------|
| a) hoop  | b) helical      |
| c) polar | d) all of these |
- 3) A low viscosity resin such as polyester or epoxy resin is injected under low pressure into a closed mold that contains the fiber perform is called \_\_\_\_\_.
 

|                           |                      |
|---------------------------|----------------------|
| a) hand lay up            | b) autoclave forming |
| c) resin transfer molding | d) filament winding  |
- 4) Material has properties that are a function of the position on the body \_\_\_\_\_.
 

|                |                   |
|----------------|-------------------|
| a) orthotropic | b) isotropic      |
| c) anisotropic | d) nonhomogeneous |
- 5) \_\_\_\_\_ is a single flat layer of unidirectional fibers or woven fibers arranged in a matrix.
 

|             |           |
|-------------|-----------|
| a) Laminate | b) Layer  |
| c) Lamina   | d) Matrix |
- 6) \_\_\_\_\_ is a stack of plies of composites, each layer can be laid at various orientations and can be made up of different material systems.
 

|           |                  |
|-----------|------------------|
| a) Matrix | b) Laminate      |
| c) Layer  | d) none of these |
- 7) \_\_\_\_\_ composites contain more than one fiber or one matrix system in a laminate.
 

|           |                  |
|-----------|------------------|
| a) Hybrid | b) Laminate      |
| c) Layer  | d) none of these |
- 8) \_\_\_\_\_ composite materials consist of the smallest size of reinforced in matrix.
 

|                |                 |
|----------------|-----------------|
| a) Short fiber | b) Whisker      |
| c) Particulate | d) Monofilament |

- 9) \_\_\_\_\_ composite materials consist of layers of at least two different materials that are bonded together.
- |                 |              |
|-----------------|--------------|
| a) Short fiber  | b) Whisker   |
| c) Monofilament | d) Laminated |
- 10) The protection of material ingredient is role of \_\_\_\_\_.
- |                                  |                  |
|----------------------------------|------------------|
| a) matrix                        | b) reinforcement |
| c) both matrix and reinforcement | d) interphase    |
- 11) Carrying the load and supporting whole material is role of \_\_\_\_\_.
- |                                  |                  |
|----------------------------------|------------------|
| a) matrix                        | b) reinforcement |
| c) both matrix and reinforcement | d) interphase    |
- 12) Composite material is made up of \_\_\_\_\_.
- |                                  |                  |
|----------------------------------|------------------|
| a) matrix                        | b) reinforcement |
| c) both matrix and reinforcement | d) interphase    |
- 13) Following is the area of application of composite \_\_\_\_\_.
- |              |                     |
|--------------|---------------------|
| a) defence   | b) marian           |
| c) aerospace | d) all of the above |
- 14) \_\_\_\_\_ has high mechanical strength and good adherence to metals and glasses is property of.
- |              |            |
|--------------|------------|
| a) Polyester | b) Epoxy   |
| c) Gum       | d) Fevicol |

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| Set | S |
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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Composite Material**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programable calculator is allowed.  
 4) Make suitable assumptions if necessary and state it clearly.

**Section – I**

- Q.2 Answer the following question. 14**  
 a) Classify the composite material and describe in detail all types of composite materials.  
 b) Derive the stress-strain relation for monoclinic material in plane stress condition.
- Q.3 Answer the following question. 14**  
 a) Describe Engineering Constants of an Angle Lamina.  
 b) Explain Hooke's Law for a Two-Dimensional Unidirectional Lamina.
- Q.4 Answer the following question.**  
 a) Write short note on Plane Stress Assumption. **04**  
 b) Explain recycling fiber-reinforced composites. **05**  
 c) Explain Transversely Isotropic Material. **05**

**Section – II**

- Q.5 Answer the following question.**  
 a) Describe filament winding process for composite material manufacturing. **05**  
 b) Explain the term Pultrusion. **05**  
 c) Describe the concept of volume and mass fractions. **04**
- Q.6 Answer the following question.**  
 a) Describe in detail the semi-empirical model. **06**  
 b) A glass/epoxy lamina consists of a 70% fiber volume fraction. Use properties of glass and epoxy ( $\rho_f = 2500 \text{ kg/m}^3$ ,  $\rho_m = 1200 \text{ kg/m}^3$ ) to determine the **08**  
 1) Density of lamina  
 2) Mass fractions of the glass and epoxy  
 3) Volume of composite lamina if the mass of the lamina is 4 kg
- Q.7 Answer the following question.**  
 a) Describe the concepts of Longitudinal Young's Modulus Transverse Young's Modulus. **05**  
 b) Describe the transverse Young's Modulus and Major Poisson's Ratio. **05**  
 c) Explain the effect of Void Content on composite material. **04**

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Set

P

**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) The solution of partial differential equation  $\sqrt{p} + \sqrt{q} = 2$  is \_\_\_\_\_.
  - a)  $z = ax + (1 - \sqrt{b})y + c$
  - b)  $z = a^2x + b^2y + c$
  - c)  $z = ax + (2 - \sqrt{a})^2y + c$
  - d)  $z = a(x + y) + c$
- 2) The solution of partial differential equation  $xp - yq = z$  is \_\_\_\_\_.
  - a)  $\phi(xy, yz) = 0$
  - b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$
  - c)  $\phi(\log x, \log y) = 0$
  - d)  $\phi(x + y, y + z) = 0$
- 3) In solving algebraic and Transcendental equations, which of the following method is called method of tangent?
  - a) Trapezoidal rule
  - b) Newton's Raphson method
  - c) Regula Falsie method
  - d) Weddle's rule
- 4) A positive real root of the equation  $xe^x - 2 = 0$  is lies between \_\_\_\_\_.
  - a) 2 and 3
  - b) 1 and 2
  - c) 3 and 4
  - d) 0 and 1
- 5) In the cosine series of  $f(x) = \pi x - x^2$  for  $0 < x < \pi$ , the constant term is \_\_\_\_\_.
  - a)  $\frac{\pi^2}{4}$
  - b)  $\frac{\pi^2}{16}$
  - c)  $\frac{\pi^2}{6}$
  - d)  $\frac{\pi^2}{2}$
- 6) The coefficient of  $\cos(nx)$  in the Fourier series of  $f(x) = x^3$  in  $(-\pi, \pi)$  is \_\_\_\_\_.
  - a) 0
  - b)  $\frac{1}{n}$
  - c)  $\frac{4(-1)^n}{n^2}$
  - d)  $\frac{-2(-1)^n}{n}$

- 7) Gaussian Quadrature formula is used \_\_\_\_\_.  
 a) To solve partial differential equation  
 b) To solve ordinary differential equation  
 c) To find the roots of transcendental equation  
 d) To evaluate the definite integration.
- 8) For the data  $\begin{matrix} x: & 0 & 0.2 & 0.4 \\ y: & 2 & 4 & 5 \end{matrix}$   
 By Trapezoidal rule the value of integration  $\int_0^{0.4} \frac{1}{y} dx$  is \_\_\_\_\_.  
 a) 1.02  
 b) 0.12  
 c) 0.3010  
 d) 1.0012
- 9) To apply Simpson's 3/8<sup>th</sup> rule, the number of sub interval must be \_\_\_\_\_.  
 a) even  
 b) odd  
 c) multiple of 3  
 d) multiple of 4
- 10) If the Poisson distribution is such that  $P(x = 1) = P(x = 2)$  then the mean  $m$  is \_\_\_\_\_.  
 a) 1  
 b) 3  
 c) 2  
 d) 4
- 11) The area under the standard normal curve from  $z = -\infty$  to  $z = 0$  is \_\_\_\_\_.  
 a) 1  
 b) 0  
 c) 1.5  
 d) 0.5
- 12) The value of coefficient of correlation  $r$  lies between \_\_\_\_\_.  
 a) -3 and 3  
 b) -1 and 1  
 c) 1 and 2  
 d) 2 and 3
- 13) If the probability of defective bulbs is 0.02 then the mean of the distribution of defective bulb in a lot of 1000 bulbs is \_\_\_\_\_.  
 a) 160  
 b) 20  
 c) 200  
 d) 120
- 14) If the coefficient of regressions are  $b_{xy} = \frac{5}{6}$  &  $b_{yx} = \frac{8}{15}$  then the coefficient of correlation 'r' is \_\_\_\_\_.  
 a) 0.67  
 b) 1.5  
 c) 0.5  
 d) 0.4

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Set

P

**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day &amp; Date: Monday, 06-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions: 1) All questions are compulsory.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Answer any three questions.**

- a) Solve:  $y^2 zp + x^2 zq = xy^2$  03  
 b) Solve:  $p^3 + q^3 = 27z$  03  
 c) Solve:  $py = 2xy + \log q$  03  
 d) Solve:  $3x \frac{\partial z}{\partial x} - 5y \frac{\partial z}{\partial y} = 0$  by the method of separation of variables. 03

- Q.3 a)** Obtain a Fourier series of  $f(x) = x + x^2$  in the range  $-\pi < x < \pi$  06

**OR**

- a) Expand  $f(x) = e^{ax}$  as a Fourier series in interval  $(0, 2\pi)$  06  
 b) Obtain half range cosine series of  $f(x) = x$  in  $0 < x < 2$  04

**Q.4 Answer any three questions.**

- a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Simpson's 1/3<sup>rd</sup> rule. (Take  $h = 1$ ) 03  
 b) Evaluate  $\int_2^3 \frac{1}{x+1} dx$  using Gaussian three points formula. 03  
 c) Curve is drawn to pass through the points given by the following table. 03  
 $x:$  1    1.5    2    2.5    3    3.5    4  
 $y:$  2    2.4    2.7    2.8    3    2.6    2.1  
 Using Simpson's 3/8<sup>th</sup> rule, estimate the area bounded between the curve, the  $x$  – axis and the lines  $x = 1$  and  $x = 4$   
 d) Evaluate  $\int_0^1 \int_0^1 \frac{1}{1+x+y} dx dy$  using Trapezoidal rule Taking  $h = 0.5, k = 0.5$  03

**Section – II**

**Q.5 Answer any three questions.**

- a) Find a positive real root of the equation  $x - e^{-x} = 0$  correct to four places of decimal using Newton's Raphson method 03  
 b) Find a positive real root of the equation  $x^3 - 3x - 7 = 0$  is one step of Muller's method. Taking three initial approximation 2, 2.5 and 3 03  
 c) Find the value of  $k$ , if the following function is probability density function. 03  
 $f(x) = \frac{k}{1+x^2}, \quad -\infty < x < \infty$

- d) From the following results obtain the two regression equations. 03
- |                    | $y$ (yield in Kg) | $x$ (rain fall in cms) |
|--------------------|-------------------|------------------------|
| Mean $\rightarrow$ | 508.4             | 26.7                   |
| S.D $\rightarrow$  | 36.8              | 4.6                    |
- and coefficient of correlation is  $r = 0.52$

**Q.6 Attempt any three from the following.**

- a) Find a positive real root of the equation  $2x - \log_e x - 6 = 0$  correct to three decimal places by False position method 03
- b) The probability that a student in an evening college will graduate is 0.4. Determine the probability that out of 5 students (i) none (ii) one will graduate. 03
- c) If 3% of bulbs manufactured by a company are defective, assuming Poisson distribution find the probability that in a pack of 100 bulbs (i) zero bulbs (ii) two bulbs are defective. 03
- d) Using Newton's Raphson iterative formula, find the approximate value of  $\sqrt{12}$  correct to three decimal places. 03

**Q.7 Attempt any two from the following.**

- a) Obtain the Karl Pearson's coefficient of correlation between export of raw material ( $x$ ) and import of finished goods ( $y$ ) from the data. 05
- |       |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|
| $x$ : | 42 | 44 | 58 | 55 | 89 | 98 | 66 |
| $y$ : | 56 | 59 | 53 | 58 | 65 | 78 | 58 |
- b) Using Newton's Raphson method, solve the system of non-linear equations  $x^2 + y - 11 = 0$ ,  $y^2 + x - 7 = 0$  starting with the initial values  $x_0 = 3.5$ ,  $y_0 = -1.5$  (Perform two iterations). 05
- c) If the mean life time and standard deviation of battery cells are 12 hrs. and 3 hrs. What percentage of batteries will have life 05
- (i) between 10 and 14 hrs.
- (ii) more than 15 hrs.
- (iii) less than 6 hrs.
- Assume the distribution to be normal.
- (Given: For S.N.V  $z$ , area from  $z = 0$  to  $z = 0.67$  is 0.2486, from  $z = 0$  to  $z = 1$  is 0.3413 and from  $z = 0$  to  $z = 2$  is 0.4772)

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No.**

Max. Marks: 70

Marks: 14

14

- Page 5 of 16



- 8) The solution of partial differential equation  $\sqrt{p} + \sqrt{q} = 2$  is \_\_\_\_\_.  
 a)  $z = ax + (1 - \sqrt{b})y + c$   
 b)  $z = a^2x + b^2y + c$   
 c)  $z = ax + (2 - \sqrt{a})^2y + c$   
 d)  $z = a(x + y) + c$
- 9) The solution of partial differential equation  $xp - yq = z$  is \_\_\_\_\_.  
 a)  $\phi(xy, yz) = 0$   
 b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$   
 c)  $\phi(\log x, \log y) = 0$   
 d)  $\phi(x + y, y + z) = 0$
- 10) In solving algebraic and Transcendental equations, which of the following method is called method of tangent?  
 a) Trapezoidal rule  
 b) Newton's Raphson method  
 c) Regula Falsie method  
 d) Weddle's rule
- 11) A positive real root of the equation  $xe^x - 2 = 0$  is lies between \_\_\_\_\_.  
 a) 2 and 3  
 b) 1 and 2  
 c) 3 and 4  
 d) 0 and 1
- 12) In the cosine series of  $f(x) = \pi x - x^2$  for  $0 < x < \pi$ , the constant term is \_\_\_\_\_.  
 a)  $\frac{\pi^2}{4}$   
 b)  $\frac{\pi^2}{16}$   
 c)  $\frac{\pi^2}{6}$   
 d)  $\frac{\pi^2}{2}$
- 13) The coefficient of  $\cos(nx)$  in the Fourier series of  $f(x) = x^3$  in  $(-\pi, \pi)$  is \_\_\_\_\_.  
 a) 0  
 b)  $\frac{1}{n}$   
 c)  $\frac{4(-1)^n}{n^2}$   
 d)  $\frac{-2(-1)^n}{n}$
- 14) Gaussian Quadrature formula is used \_\_\_\_\_.  
 a) To solve partial differential equation  
 b) To solve ordinary differential equation  
 c) To find the roots of transcendental equation  
 d) To evaluate the definite integration.

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions: 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Answer any three questions.**

- a) Solve:  $y^2 zp + x^2 zq = xy^2$  03  
 b) Solve:  $p^3 + q^3 = 27z$  03  
 c) Solve:  $py = 2xy + \log q$  03  
 d) Solve:  $3x \frac{\partial z}{\partial x} - 5y \frac{\partial z}{\partial y} = 0$  by the method of separation of variables. 03

**Q.3 a) Obtain a Fourier series of  $f(x) = x + x^2$  in the range  $-\pi < x < \pi$**  06

**OR**

- a) Expand  $f(x) = e^{ax}$  as a Fourier series in interval  $(0, 2\pi)$  06  
 b) Obtain half range cosine series of  $f(x) = x$  in  $0 < x < 2$  04

**Q.4 Answer any three questions.**

- a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Simpson's 1/3<sup>rd</sup> rule. (Take  $h = 1$ ) 03  
 b) Evaluate  $\int_2^3 \frac{1}{x+1} dx$  using Gaussian three points formula. 03  
 c) Curve is drawn to pass through the points given by the following table. 03  

|    |   |     |     |     |   |     |     |
|----|---|-----|-----|-----|---|-----|-----|
| x: | 1 | 1.5 | 2   | 2.5 | 3 | 3.5 | 4   |
| y: | 2 | 2.4 | 2.7 | 2.8 | 3 | 2.6 | 2.1 |

Using Simpson's 3/8<sup>th</sup> rule, estimate the area bounded between the curve, the  $x$  – axis and the lines  $x = 1$  and  $x = 4$

d) Evaluate  $\int_0^1 \int_0^1 \frac{1}{1+x+y} dx dy$  using Trapezoidal rule Taking  $h = 0.5, k = 0.5$  03

**Section – II**

**Q.5 Answer any three questions.**

- a) Find a positive real root of the equation  $x - e^{-x} = 0$  correct to four places of decimal using Newton's Raphson method 03  
 b) Find a positive real root of the equation  $x^3 - 3x - 7 = 0$  is one step of Muller's method. Taking three initial approximation 2, 2.5 and 3 03  
 c) Find the value of  $k$ , if the following function is probability density function. 03  

$$f(x) = \frac{k}{1+x^2}, \quad -\infty < x < \infty$$

- d) From the following results obtain the two regression equations. 03
- |                    |                   |                        |
|--------------------|-------------------|------------------------|
|                    | $y$ (yield in Kg) | $x$ (rain fall in cms) |
| Mean $\rightarrow$ | 508.4             | 26.7                   |
| S.D $\rightarrow$  | 36.8              | 4.6                    |
- and coefficient of correlation is  $r = 0.52$

**Q.6 Attempt any three from the following.**

- a) Find a positive real root of the equation  $2x - \log_e x - 6 = 0$  correct to three decimal places by False position method 03
- b) The probability that a student in an evening college will graduate is 0.4. Determine the probability that out of 5 students (i) none (ii) one will graduate. 03
- c) If 3% of bulbs manufactured by a company are defective, assuming Poisson distribution find the probability that in a pack of 100 bulbs (i) zero bulbs (ii) two bulbs are defective. 03
- d) Using Newton's Raphson iterative formula, find the approximate value of  $\sqrt{12}$  correct to three decimal places. 03

**Q.7 Attempt any two from the following.**

- a) Obtain the Karl Pearson's coefficient of correlation between export of raw material ( $x$ ) and import of finished goods ( $y$ ) from the data. 05
- |       |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|
| $x$ : | 42 | 44 | 58 | 55 | 89 | 98 | 66 |
| $y$ : | 56 | 59 | 53 | 58 | 65 | 78 | 58 |
- b) Using Newton's Raphson method, solve the system of non-linear equations  $x^2 + y - 11 = 0$ ,  $y^2 + x - 7 = 0$  starting with the initial values  $x_0 = 3.5$ ,  $y_0 = -1.5$  (Perform two iterations). 05
- c) If the mean life time and standard deviation of battery cells are 12 hrs. and 3 hrs. What percentage of batteries will have life 05
- (i) between 10 and 14 hrs.
- (ii) more than 15 hrs.
- (iii) less than 6 hrs.
- Assume the distribution to be normal.
- (Given: For S.N.V  $z$ , area from  $z = 0$  to  $z = 0.67$  is 0.2486, from  $z = 0$  to  $z = 1$  is 0.3413 and from  $z = 0$  to  $z = 2$  is 0.4772)

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## Max. Marks: 70

Marks: 14

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Set **R**

**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions: 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Answer any three questions.**

- a) Solve:  $y^2 zp + x^2 zq = xy^2$  **03**  
 b) Solve:  $p^3 + q^3 = 27z$  **03**  
 c) Solve:  $py = 2xy + \log q$  **03**  
 d) Solve:  $3x \frac{\partial z}{\partial x} - 5y \frac{\partial z}{\partial y} = 0$  by the method of separation of variables. **03**

**Q.3 a) Obtain a Fourier series of  $f(x) = x + x^2$  in the range  $-\pi < x < \pi$**  **06**

**OR**

- a) Expand  $f(x) = e^{ax}$  as a Fourier series in interval  $(0, 2\pi)$  **06**  
 b) Obtain half range cosine series of  $f(x) = x$  in  $0 < x < 2$  **04**

**Q.4 Answer any three questions.**

- a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Simpson's 1/3<sup>rd</sup> rule. (Take  $h = 1$ ) **03**  
 b) Evaluate  $\int_2^3 \frac{1}{x+1} dx$  using Gaussian three points formula. **03**  
 c) Curve is drawn to pass through the points given by the following table. **03**  

|      |   |     |     |     |   |     |     |
|------|---|-----|-----|-----|---|-----|-----|
| $x:$ | 1 | 1.5 | 2   | 2.5 | 3 | 3.5 | 4   |
| $y:$ | 2 | 2.4 | 2.7 | 2.8 | 3 | 2.6 | 2.1 |

Using Simpson's 3/8<sup>th</sup> rule, estimate the area bounded between the curve, the  $x$  – axis and the lines  $x = 1$  and  $x = 4$

d) Evaluate  $\int_0^1 \int_0^1 \frac{1}{1+x+y} dx dy$  using Trapezoidal rule Taking  $h = 0.5, k = 0.5$  **03**

**Section – II**

**Q.5 Answer any three questions.**

- a) Find a positive real root of the equation  $x - e^{-x} = 0$  correct to four places of decimal using Newton's Raphson method **03**  
 b) Find a positive real root of the equation  $x^3 - 3x - 7 = 0$  is one step of Muller's method. Taking three initial approximation 2, 2.5 and 3 **03**  
 c) Find the value of  $k$ , if the following function is probability density function. **03**  

$$f(x) = \frac{k}{1+x^2}, \quad -\infty < x < \infty$$

- d) From the following results obtain the two regression equations. 03
- |                    |                   |                        |
|--------------------|-------------------|------------------------|
|                    | $y$ (yield in Kg) | $x$ (rain fall in cms) |
| Mean $\rightarrow$ | 508.4             | 26.7                   |
| S.D $\rightarrow$  | 36.8              | 4.6                    |
- and coefficient of correlation is  $r = 0.52$

**Q.6 Attempt any three from the following.**

- a) Find a positive real root of the equation  $2x - \log_e x - 6 = 0$  correct to three decimal places by False position method 03
- b) The probability that a student in an evening college will graduate is 0.4. Determine the probability that out of 5 students (i) none (ii) one will graduate. 03
- c) If 3% of bulbs manufactured by a company are defective, assuming Poisson distribution find the probability that in a pack of 100 bulbs (i) zero bulbs (ii) two bulbs are defective. 03
- d) Using Newton's Raphson iterative formula, find the approximate value of  $\sqrt{12}$  correct to three decimal places. 03

**Q.7 Attempt any two from the following.**

- a) Obtain the Karl Pearson's coefficient of correlation between export of raw material ( $x$ ) and import of finished goods ( $y$ ) from the data. 05
- |       |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|
| $x$ : | 42 | 44 | 58 | 55 | 89 | 98 | 66 |
| $y$ : | 56 | 59 | 53 | 58 | 65 | 78 | 58 |
- b) Using Newton's Raphson method, solve the system of non-linear equations  $x^2 + y - 11 = 0$ ,  $y^2 + x - 7 = 0$  starting with the initial values  $x_0 = 3.5$ ,  $y_0 = -1.5$  (Perform two iterations). 05
- c) If the mean life time and standard deviation of battery cells are 12 hrs. and 3 hrs. What percentage of batteries will have life 05
- (i) between 10 and 14 hrs.
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- (iii) less than 6 hrs.
- Assume the distribution to be normal.
- (Given: For S.N.V  $z$ , area from  $z = 0$  to  $z = 0.67$  is 0.2486, from  $z = 0$  to  $z = 1$  is 0.3413 and from  $z = 0$  to  $z = 2$  is 0.4772)

**Seat  
No.**

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Day & Date: Monday, 06-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

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Set **S**

**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions: 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I****Q.2 Answer any three questions.**

- a) Solve:  $y^2 zp + x^2 zq = xy^2$  03  
 b) Solve:  $p^3 + q^3 = 27z$  03  
 c) Solve:  $py = 2xy + \log q$  03  
 d) Solve:  $3x \frac{\partial z}{\partial x} - 5y \frac{\partial z}{\partial y} = 0$  by the method of separation of variables. 03

**Q.3 a) Obtain a Fourier series of  $f(x) = x + x^2$  in the range  $-\pi < x < \pi$  06****OR**

- a) Expand  $f(x) = e^{ax}$  as a Fourier series in interval  $(0, 2\pi)$  06  
 b) Obtain half range cosine series of  $f(x) = x$  in  $0 < x < 2$  04

**Q.4 Answer any three questions.**

- a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Simpson's 1/3<sup>rd</sup> rule. (Take  $h = 1$ ) 03  
 b) Evaluate  $\int_2^3 \frac{1}{x+1} dx$  using Gaussian three points formula. 03  
 c) Curve is drawn to pass through the points given by the following table. 03  

$$\begin{array}{ccccccccc} x: & 1 & 1.5 & 2 & 2.5 & 3 & 3.5 & 4 \\ y: & 2 & 2.4 & 2.7 & 2.8 & 3 & 2.6 & 2.1 \end{array}$$
  
 Using Simpson's 3/8<sup>th</sup> rule, estimate the area bounded between the curve, the  $x$  – axis and the lines  $x = 1$  and  $x = 4$   
 d) Evaluate  $\int_0^1 \int_0^1 \frac{1}{1+x+y} dx dy$  using Trapezoidal rule Taking  $h = 0.5, k = 0.5$  03

**Section – II****Q.5 Answer any three questions.**

- a) Find a positive real root of the equation  $x - e^{-x} = 0$  correct to four places of decimal using Newton's Raphson method 03  
 b) Find a positive real root of the equation  $x^3 - 3x - 7 = 0$  is one step of Muller's method. Taking three initial approximation 2, 2.5 and 3 03  
 c) Find the value of  $k$ , if the following function is probability density function. 03  

$$f(x) = \frac{k}{1+x^2}, \quad -\infty < x < \infty$$

- d) From the following results obtain the two regression equations. 03
- |                    | $y$ (yield in Kg) | $x$ (rain fall in cms) |
|--------------------|-------------------|------------------------|
| Mean $\rightarrow$ | 508.4             | 26.7                   |
| S.D $\rightarrow$  | 36.8              | 4.6                    |
- and coefficient of correlation is  $r = 0.52$

**Q.6 Attempt any three from the following.**

- a) Find a positive real root of the equation  $2x - \log_e x - 6 = 0$  correct to three decimal places by False position method 03
- b) The probability that a student in an evening college will graduate is 0.4. Determine the probability that out of 5 students (i) none (ii) one will graduate. 03
- c) If 3% of bulbs manufactured by a company are defective, assuming Poisson distribution find the probability that in a pack of 100 bulbs (i) zero bulbs (ii) two bulbs are defective. 03
- d) Using Newton's Raphson iterative formula, find the approximate value of  $\sqrt{12}$  correct to three decimal places. 03

**Q.7 Attempt any two from the following.**

- a) Obtain the Karl Pearson's coefficient of correlation between export of raw material ( $x$ ) and import of finished goods ( $y$ ) from the data. 05
- |       |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|
| $x$ : | 42 | 44 | 58 | 55 | 89 | 98 | 66 |
| $y$ : | 56 | 59 | 53 | 58 | 65 | 78 | 58 |
- b) Using Newton's Raphson method, solve the system of non-linear equations  $x^2 + y - 11 = 0$ ,  $y^2 + x - 7 = 0$  starting with the initial values  $x_0 = 3.5$ ,  $y_0 = -1.5$  (Perform two iterations). 05
- c) If the mean life time and standard deviation of battery cells are 12 hrs. and 3 hrs. What percentage of batteries will have life 05
- (i) between 10 and 14 hrs.
- (ii) more than 15 hrs.
- (iii) less than 6 hrs.
- Assume the distribution to be normal.
- (Given: For S.N.V  $z$ , area from  $z = 0$  to  $z = 0.67$  is 0.2486, from  $z = 0$  to  $z = 1$  is 0.3413 and from  $z = 0$  to  $z = 2$  is 0.4772)

**Seat  
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Max. Marks: 70

Marks: 14

14

- Page 1 of 12

- 9) In simple indexing method, one complete rotation of spindle makes rotation of index crank \_\_\_\_\_.  
a) 24  
b) 40  
c) 20  
d) 30
- 10) The gear shaving is the process of \_\_\_\_\_.  
a) Gear generation  
b) Gear finishing  
c) Gear forging  
d) Gear casting
- 11) The grinding of flat surfaces can be accomplished in \_\_\_\_\_.  
a) Cylindrical grinding M/C  
b) Centre less grinding M/C  
c) Surface grinding M/C  
d) Hand grinder
- 12) Grinding is the process of removing material by a \_\_\_\_\_ action.  
a) Rubbing  
b) Cutting  
c) Polishing  
d) Wearing
- 13) What is the material removal mechanism in electrochemical machining?  
a) Electrolysis  
b) Indentation  
c) Melting and vaporization  
d) Electro deposition
- 14) In Electro Discharge Machining (EDM) the tool is made of \_\_\_\_\_.  
a) Copper  
b) H.S.S.  
c) Cast Iron  
d) Tool Steel

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Technology**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** - 1) Attempt any Two Questions from section I and II.  
 2) Draw neat sketches.  
 3) Make suitable assumptions if required.

**Section – I**

- Q.2**
- a) Draw a neat sketch of centre lathe and explain its parts. **05**
  - b) List the different accessories used in lathe machine. Explain Three jaw chuck. **05**
  - c) A 40 mm dia. and 80 mm length M.S. round bar is to be taper turned over entire length to the dia. of 30 mm. Calculate set over distance and taper angle. **04**
- Q.3**
- a) Explain the construction and working of Radial drilling machine with neat sketch. **05**
  - b) Explain construction and working of vertical boring machine with neat sketch. **05**
  - c) Classify broaching machine and explain with neat sketch pull type broach. **04**
- Q.4**
- a) Explain with neat sketch construction and working of Shaping machine. **05**
  - b) Explain operations carried out on shaper machine. **05**
  - c) Explain Slotting machine. **04**

**Section – II**

- Q.5**
- a) Explain with neat sketch column and knee type milling machine. **05**
  - b) Index work piece for 73 divisions on milling machine using dividing head by differential indexing method, Data given: Indexing plate:  
 Plate 1: --- 15, 16, 17, 18, 19, 20  
 Plate 2: --- 21, 23, 27, 29, 31, 33  
 Plate 3: --- 37, 39, 41, 43, 47, 49  
 Change Gears with teeth number 24, 24, 28, 32, 40, 44, 48, 56, 64, 72, 86 and 100 (one gear each) **05**
  - c) Gear rolling and Gear shaving **04**
- Q.6**
- a) Explain with neat sketch cylindrical grinding machine. **05**
  - b) What do you understand from grain, grit, structure and grade of grinding wheel? Explain. **05**
  - c) Explain Lapping process. **04**
- Q.7**
- a) Explain with neat sketches construction working, principle of EDM machine **05**
  - b) Explain with neat sketches construction working, principle of AWJM machine. **05**
  - c) Explain Difference between conventional and Non-conventional machining process. **04**

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 4 of 12

- 10) In the Lathe machine long, Hollow shaft is supported by \_\_\_\_\_.
  - a) Lathe Dogs
  - b) Lathe Centres
  - c) Steady Rest
  - d) Lathe Mandrels
- 11) Table contains \_\_\_\_\_ slots.
  - a) L-slots
  - b) T-Slots
  - c) H-Slots
  - d) All of these
- 12) The cylindrical work pieces are held in the drilling machine to carry the operations in \_\_\_\_\_.
  - a) C-clamp
  - b) Machine Vice
  - c) V block
  - d) T-bolt
- 13) The job reciprocates in \_\_\_\_\_.
  - a) Shaping machine
  - b) Planing machine
  - c) Slotting machine
  - d) All of the above
- 14) Internal keyway in gears can be cut in \_\_\_\_\_.
  - a) Shaping machine
  - b) Planning machine
  - c) Slotting machine
  - d) None of the above



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Technology**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** - 1) Attempt any Two Questions from section I and II.  
 2) Draw neat sketches.  
 3) Make suitable assumptions if required.

**Section – I**

- |            |                                                                                                                                                                    |           |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Draw a neat sketch of centre lathe and explain its parts.                                                                                                | <b>05</b> |
|            | <b>b)</b> List the different accessories used in lathe machine. Explain Three jaw chuck.                                                                           | <b>05</b> |
|            | <b>c)</b> A 40 mm dia. and 80 mm length M.S. round bar is to be taper turned over entire length to the dia. of 30 mm. Calculate set over distance and taper angle. | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Explain the construction and working of Radial drilling machine with neat sketch.                                                                        | <b>05</b> |
|            | <b>b)</b> Explain construction and working of vertical boring machine with neat sketch.                                                                            | <b>05</b> |
|            | <b>c)</b> Classify broaching machine and explain with neat sketch pull type broach.                                                                                | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain with neat sketch construction and working of Shaping machine.                                                                                    | <b>05</b> |
|            | <b>b)</b> Explain operations carried out on shaper machine.                                                                                                        | <b>05</b> |
|            | <b>c)</b> Explain Slotting machine.                                                                                                                                | <b>04</b> |

**Section – II**

- |            |                                                                                                                                                                                                                                                                                                                                                                           |           |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> Explain with neat sketch column and knee type milling machine.                                                                                                                                                                                                                                                                                                  | <b>05</b> |
|            | <b>b)</b> Index work piece for 73 divisions on milling machine using dividing head by differential indexing method, Data given: Indexing plate:<br>Plate 1: --- 15, 16, 17, 18, 19, 20<br>Plate 2: --- 21, 23, 27, 29, 31, 33<br>Plate 3: --- 37, 39, 41, 43, 47, 49<br>Change Gears with teeth number 24, 24, 28, 32, 40, 44, 48, 56, 64, 72, 86 and 100 (one gear each) | <b>05</b> |
|            | <b>c)</b> Gear rolling and Gear shaving                                                                                                                                                                                                                                                                                                                                   | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Explain with neat sketch cylindrical grinding machine.                                                                                                                                                                                                                                                                                                          | <b>05</b> |
|            | <b>b)</b> What do you understand from grain, grit, structure and grade of grinding wheel? Explain.                                                                                                                                                                                                                                                                        | <b>05</b> |
|            | <b>c)</b> Explain Lapping process.                                                                                                                                                                                                                                                                                                                                        | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> Explain with neat sketches construction working, principle of EDM machine                                                                                                                                                                                                                                                                                       | <b>05</b> |
|            | <b>b)</b> Explain with neat sketches construction working, principle of AWJM machine.                                                                                                                                                                                                                                                                                     | <b>05</b> |
|            | <b>c)</b> Explain Difference between conventional and Non-conventional machining process.                                                                                                                                                                                                                                                                                 | <b>04</b> |

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Technology**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The grinding of flat surfaces can be accomplished in \_\_\_\_\_.  
 a) Cylindrical grinding M/C                      b) Centre less grinding M/C  
 c) Surface grinding M/C                          d) Hand grinder
- 2) Grinding is the process of removing material by a \_\_\_\_\_ action.  
 a) Rubbing                                              b) Cutting  
 c) Polishing                                            d) Wearing
- 3) What is the material removal mechanism in electrochemical machining?  
 a) Electrolysis                                        b) Indentation  
 c) Melting and vaporization                    d) Electro deposition
- 4) In Electro Discharge Machining (EDM) the tool is made of \_\_\_\_\_.  
 a) Copper                                              b) H.S.S.  
 c) Cast Iron                                            d) Tool Steel
- 5) The following part of Lathe serves as housing for the driving pulleys and back gears \_\_\_\_\_.  
 a) Head stock                                        b) Tail stock  
 c) Bed                                                    d) Carriage
- 6) Tapping operation can perform in \_\_\_\_\_.  
 a) Lathe machine                                    b) Slotting machine  
 c) Grinding machine                                d) Drilling machine
- 7) In the Lathe machine long, Hollow shaft is supported by \_\_\_\_\_.  
 a) Lathe Dogs                                        b) Lathe Centres  
 c) Steady Rest                                        d) Lathe Mandrels
- 8) Table contains \_\_\_\_\_ slots.  
 a) L-slots                                                b) T-Slots  
 c) H-Slots                                               d) All of these
- 9) The cylindrical work pieces are held in the drilling machine to carry the operations in \_\_\_\_\_.  
 a) C-clamp                                              b) Machine Vice  
 c) V block                                               d) T-bolt

- 10)** The job reciprocates in \_\_\_\_\_.  
a) Shaping machine                      b) Planing machine  
c) Slotting machine                      d) All of the above
- 11)** Internal keyway in gears can be cut in \_\_\_\_\_.  
a) Shaping machine                      b) Planning machine  
c) Slotting machine                      d) None of the above
- 12)** The chips are minimum at the initial and maximum when cut terminates in \_\_\_\_\_.  
a) Down Milling                              b) Form Milling  
c) Side Milling                                d) Conventional Milling
- 13)** In simple indexing method, one complete rotation of spindle makes rotation of index crank \_\_\_\_\_.  
a) 24                                              b) 40  
c) 20                                              d) 30
- 14)** The gear shaving is the process of \_\_\_\_\_.  
a) Gear generation                        b) Gear finishing  
c) Gear forging                              d) Gear casting

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Technology**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** - 1) Attempt any Two Questions from section I and II.  
 2) Draw neat sketches.  
 3) Make suitable assumptions if required.

**Section – I**

- |            |                                                                                                                                                                    |           |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Draw a neat sketch of centre lathe and explain its parts.                                                                                                | <b>05</b> |
|            | <b>b)</b> List the different accessories used in lathe machine. Explain Three jaw chuck.                                                                           | <b>05</b> |
|            | <b>c)</b> A 40 mm dia. and 80 mm length M.S. round bar is to be taper turned over entire length to the dia. of 30 mm. Calculate set over distance and taper angle. | <b>04</b> |
| <b>Q.3</b> | <b>a)</b> Explain the construction and working of Radial drilling machine with neat sketch.                                                                        | <b>05</b> |
|            | <b>b)</b> Explain construction and working of vertical boring machine with neat sketch.                                                                            | <b>05</b> |
|            | <b>c)</b> Classify broaching machine and explain with neat sketch pull type broach.                                                                                | <b>04</b> |
| <b>Q.4</b> | <b>a)</b> Explain with neat sketch construction and working of Shaping machine.                                                                                    | <b>05</b> |
|            | <b>b)</b> Explain operations carried out on shaper machine.                                                                                                        | <b>05</b> |
|            | <b>c)</b> Explain Slotting machine.                                                                                                                                | <b>04</b> |

**Section – II**

- |            |                                                                                                                                                                                                                                                                                                                                                                           |           |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> Explain with neat sketch column and knee type milling machine.                                                                                                                                                                                                                                                                                                  | <b>05</b> |
|            | <b>b)</b> Index work piece for 73 divisions on milling machine using dividing head by differential indexing method, Data given: Indexing plate:<br>Plate 1: --- 15, 16, 17, 18, 19, 20<br>Plate 2: --- 21, 23, 27, 29, 31, 33<br>Plate 3: --- 37, 39, 41, 43, 47, 49<br>Change Gears with teeth number 24, 24, 28, 32, 40, 44, 48, 56, 64, 72, 86 and 100 (one gear each) | <b>05</b> |
|            | <b>c)</b> Gear rolling and Gear shaving                                                                                                                                                                                                                                                                                                                                   | <b>04</b> |
| <b>Q.6</b> | <b>a)</b> Explain with neat sketch cylindrical grinding machine.                                                                                                                                                                                                                                                                                                          | <b>05</b> |
|            | <b>b)</b> What do you understand from grain, grit, structure and grade of grinding wheel? Explain.                                                                                                                                                                                                                                                                        | <b>05</b> |
|            | <b>c)</b> Explain Lapping process.                                                                                                                                                                                                                                                                                                                                        | <b>04</b> |
| <b>Q.7</b> | <b>a)</b> Explain with neat sketches construction working, principle of EDM machine                                                                                                                                                                                                                                                                                       | <b>05</b> |
|            | <b>b)</b> Explain with neat sketches construction working, principle of AWJM machine.                                                                                                                                                                                                                                                                                     | <b>05</b> |
|            | <b>c)</b> Explain Difference between conventional and Non-conventional machining process.                                                                                                                                                                                                                                                                                 | <b>04</b> |

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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 10 of 12

- 10)** The following part of Lathe serves as housing for the driving pulleys and back gears \_\_\_\_\_.  
a) Head stock                      b) Tail stock  
c) Bed                                d) Carriage
- 11)** Tapping operation can perform in \_\_\_\_\_.  
a) Lathe machine                  b) Slotting machine  
c) Grinding machine              d) Drilling machine
- 12)** In the Lathe machine long, Hollow shaft is supported by \_\_\_\_\_.  
a) Lathe Dogs                      b) Lathe Centres  
c) Steady Rest                      d) Lathe Mandrels
- 13)** Table contains \_\_\_\_\_ slots.  
a) L-slots                              b) T-Slots  
c) H-Slots                             d) All of these
- 14)** The cylindrical work pieces are held in the drilling machine to carry the operations in \_\_\_\_\_.  
a) C-clamp                            b) Machine Vice  
c) V block                             d) T-bolt

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Manufacturing Technology**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** - 1) Attempt any Two Questions from section I and II.  
 2) Draw neat sketches.  
 3) Make suitable assumptions if required.

**Section – I**

- Q.2**
- a) Draw a neat sketch of centre lathe and explain its parts. **05**
  - b) List the different accessories used in lathe machine. Explain Three jaw chuck. **05**
  - c) A 40 mm dia. and 80 mm length M.S. round bar is to be taper turned over entire length to the dia. of 30 mm. Calculate set over distance and taper angle. **04**
- Q.3**
- a) Explain the construction and working of Radial drilling machine with neat sketch. **05**
  - b) Explain construction and working of vertical boring machine with neat sketch. **05**
  - c) Classify broaching machine and explain with neat sketch pull type broach. **04**
- Q.4**
- a) Explain with neat sketch construction and working of Shaping machine. **05**
  - b) Explain operations carried out on shaper machine. **05**
  - c) Explain Slotting machine. **04**

**Section – II**

- Q.5**
- a) Explain with neat sketch column and knee type milling machine. **05**
  - b) Index work piece for 73 divisions on milling machine using dividing head by differential indexing method, Data given: Indexing plate:  
 Plate 1: --- 15, 16, 17, 18, 19, 20  
 Plate 2: --- 21, 23, 27, 29, 31, 33  
 Plate 3: --- 37, 39, 41, 43, 47, 49  
 Change Gears with teeth number 24, 24, 28, 32, 40, 44, 48, 56, 64, 72, 86 and 100 (one gear each) **05**
  - c) Gear rolling and Gear shaving **04**
- Q.6**
- a) Explain with neat sketch cylindrical grinding machine. **05**
  - b) What do you understand from grain, grit, structure and grade of grinding wheel? Explain. **05**
  - c) Explain Lapping process. **04**
- Q.7**
- a) Explain with neat sketches construction working, principle of EDM machine **05**
  - b) Explain with neat sketches construction working, principle of AWJM machine. **05**
  - c) Explain Difference between conventional and Non-conventional machining process. **04**

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**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The center of pressure acting on a vertically plane surface immersed in a liquid will be \_\_\_\_\_.  
 a) at the center of gravity      b) above the center of gravity  
 c) below the center of gravity      d) at the lowest level
- 2) Discharge of a centrifugal pump is \_\_\_\_\_.  
 a) Directly proportional to N      b) Inversely proportional to N  
 c) Directly proportional to N<sup>2</sup>      d) Inversely proportional to N<sup>2</sup>
- 3) The center of pressure and center of gravity are coincide when \_\_\_\_\_.  
 a) vertical surface immersed in the liquid  
 b) horizontal surface immersed in the liquid  
 c) inclined surface immersed in the liquid  
 d) curved surface immersed in the liquid
- 4) Buoyancy acts on a floating body \_\_\_\_\_.  
 a) vertically upward  
 b) horizontally  
 c) vertically downward  
 d) both vertically upward and horizontally
- 5) The centre of buoyancy of a submerged body \_\_\_\_\_.  
 a) coincides with the centre of gravity of the body  
 b) coincides with the centroid of the displaced volume of the fluid  
 c) is always below the centre of gravity of the body  
 d) is always above the centroid of the displaced volume of liquid
- 6) The flow field represented by the velocity vector  
 $V = axi + by^2 + cz t^2 k$   
 where a, b and c are constants, is  
 a) three-dimensional and unsteady  
 b) three-dimensional and steady  
 c) two-dimensional and steady  
 d) two-dimensional and unsteady





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**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Out of remaining question, attempt any two question from each section.  
 2) Assume suitable data if required.  
 3) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve.**

- a) With neat sketch explain the conditions of the equilibrium for floating body. **04**
- b) Derive an expression for total pressure and centre of pressure on an inclined plane immersed in a liquid. **05**
- c) A rectangular plane surface 2 m wide and 3 m deep lies in water in such a way that its plane makes an angle of 30° with the free surface of water. Determine the total pressure and position of centre of pressure when the upper edge is 1.5 m below the free water surface. **05**

**Q.3 Solve.**

- a) What are different types of fluid flow? Explain with an example. **04**
- b) What is venturimeter? Derive an expression for the discharge through venturimeter. **05**
- c) The velocity vector in a fluid flow is given **05**  
 $V = 4x^3i - 10x^2yj + 2tk$   
 Find the velocity and acceleration of a fluid particle at (2, 1, 3) at time  $t = 1$

**Q.4 Solve.**

- a) Define the following terms: **04**
  - 1) Stream line
  - 2) Path line
  - 3) Streak line
  - 4) Laminar flow
- b) Derive Darcy-Weisbach equation for finding loss of head due to friction in pipes. **05**
- c) Derive a condition for maximum transmission power through a pipeline. **05**  
 What is efficiency under such conditions?

## Section – II

## Q.5 Solve.

- a) Explain the different losses that occur in the pipe line connection, with formulae. 04
- b) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if co-efficient of friction are .005, .0052 and .0048 respectively by considering: minor losses. 05
- c) The resisting force R of supersonic plane during the flight can be considered as dependent upon the length of aeroplane (l), velocity (v), dynamic viscosity ( $\mu$ ), air density ( $\rho$ ), bulk modulus (K). Express the functional relationship of these variables and the resisting force using Buckingham's  $\pi$ -theorem. 05

## Q.6 Solve:

- a) A Pelton wheel is to be designed for a head of 60 m when running at 200 r.p.m. The Pelton wheel develops 95.6475 kW shaft power. The velocity of the buckets = 0.45 times the velocity of the jet, overall efficiency = 0.85 and co-efficient of the velocity is equal to 0.98. 05
- b) A reaction turbine works at 450 r.p.m. under a head of 120 metres. Its diameter at inlet is 120 cm and the flow area is 0.4 m<sup>2</sup>. The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine:  
 1) The volume flow rate,  
 2) The power developed, and  
 3) Hydraulic efficiency.  
 Assume whirl at outlet to be zero. 05
- c) Explain governing of Pelton wheel. 04

## Q.7 Solve:

- a) What is Cavitation? What are its effects on Centrifugal Pumps? What precautions are to be taken against cavitation? 04
- b) A Kaplan turbine working under a head of 20 m develops 11772 kW shaft power. The outer diameter of the runner is 3.5 m and hub diameter is 1.75 m. The guide blade angle at the extreme edge of the runner is 35°. The hydraulic and overall efficiencies of the turbines are 88% and 84% respectively. If the velocity of whirl is zero at outlet, determine:  
 1) Runner vane angles at inlet and outlet at the extreme edge of the runner, and  
 2) Speed of the turbine 05
- c) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 r.p.m. works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40° at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm, determine:  
 1) Vane angle at inlet  
 2) Work done by impeller on water per second, and  
 3) Manometric efficiency 05

**Seat  
No.**

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

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**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Out of remaining question, attempt any two question from each section.  
 2) Assume suitable data if required.  
 3) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve.**

- a) With neat sketch explain the conditions of the equilibrium for floating body. **04**
- b) Derive an expression for total pressure and centre of pressure on an inclined plane immersed in a liquid. **05**
- c) A rectangular plane surface 2 m wide and 3 m deep lies in water in such a way that its plane makes an angle of 30° with the free surface of water. Determine the total pressure and position of centre of pressure when the upper edge is 1.5 m below the free water surface. **05**

**Q.3 Solve.**

- a) What are different types of fluid flow? Explain with an example. **04**
- b) What is venturimeter? Derive an expression for the discharge through venturimeter. **05**
- c) The velocity vector in a fluid flow is given **05**  
 $V = 4x^3i - 10x^2yj + 2tk$   
 Find the velocity and acceleration of a fluid particle at (2, 1, 3) at time  $t = 1$

**Q.4 Solve.**

- a) Define the following terms: **04**
  - 1) Stream line
  - 2) Path line
  - 3) Streak line
  - 4) Laminar flow
- b) Derive Darcy-Weisbach equation for finding loss of head due to friction in pipes. **05**
- c) Derive a condition for maximum transmission power through a pipeline. **05**  
 What is efficiency under such conditions?

## Section – II

## Q.5 Solve.

- a) Explain the different losses that occur in the pipe line connection, with formulae. 04
- b) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if co-efficient of friction are .005, .0052 and .0048 respectively by considering: minor losses. 05
- c) The resisting force R of supersonic plane during the flight can be considered as dependent upon the length of aeroplane (l), velocity (v), dynamic viscosity ( $\mu$ ), air density ( $\rho$ ), bulk modulus (K). Express the functional relationship of these variables and the resisting force using Buckingham's  $\pi$ -theorem. 05

## Q.6 Solve:

- a) A Pelton wheel is to be designed for a head of 60 m when running at 200 r.p.m. The Pelton wheel develops 95.6475 kW shaft power. The velocity of the buckets = 0.45 times the velocity of the jet, overall efficiency = 0.85 and co-efficient of the velocity is equal to 0.98. 05
- b) A reaction turbine works at 450 r.p.m. under a head of 120 metres. Its diameter at inlet is 120 cm and the flow area is 0.4 m<sup>2</sup>. The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine:  
 1) The volume flow rate,  
 2) The power developed, and  
 3) Hydraulic efficiency.  
 Assume whirl at outlet to be zero. 05
- c) Explain governing of Pelton wheel. 04

## Q.7 Solve:

- a) What is Cavitation? What are its effects on Centrifugal Pumps? What precautions are to be taken against cavitation? 04
- b) A Kaplan turbine working under a head of 20 m develops 11772 kW shaft power. The outer diameter of the runner is 3.5 m and hub diameter is 1.75 m. The guide blade angle at the extreme edge of the runner is 35°. The hydraulic and overall efficiencies of the turbines are 88% and 84% respectively. If the velocity of whirl is zero at outlet, determine:  
 1) Runner vane angles at inlet and outlet at the extreme edge of the runner, and  
 2) Speed of the turbine 05
- c) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 r.p.m. works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40° at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm, determine:  
 1) Vane angle at inlet  
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 3) Manometric efficiency 05

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**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Gross head is the difference between \_\_\_\_\_.  
 a) head race and tail race                      b) head race and net head  
 c) head race and friction losses              d) net head and friction losses
- 2) The blade speed ratio of impulse turbine is given as \_\_\_\_\_.  
 a) (Steam velocity at inlet) / (Blade velocity)  
 b) (Blade velocity) / (Steam velocity at exit)  
 c) (Blade velocity) / (Steam velocity at inlet)  
 d) (Steam velocity at exit) / (Blade velocity)
- 3) Pelton turbine is \_\_\_\_\_.  
 a) Tangential flow                                      b) Radial flow  
 c) Axial flow                                              d) Mixed flow
- 4) In a centrifugal pump, the liquid enters the pump \_\_\_\_\_.  
 a) At the centre                                              b) At the bottom  
 c) At the top                                                  d) From sides
- 5) The center of pressure acting on a vertically plane surface immersed in a liquid will be \_\_\_\_\_.  
 a) at the center of gravity                      b) above the center of gravity  
 c) below the center of gravity              d) at the lowest level
- 6) Discharge of a centrifugal pump is \_\_\_\_\_.  
 a) Directly proportional to N              b) Inversely proportional to N  
 c) Directly proportional to  $N^2$               d) Inversely proportional to  $N^2$
- 7) The center of pressure and center of gravity are coincide when \_\_\_\_\_.  
 a) vertical surface immersed in the liquid  
 b) horizontal surface immersed in the liquid  
 c) inclined surface immersed in the liquid  
 d) curved surface immersed in the liquid
- 8) Buoyancy acts on a floating body \_\_\_\_\_.  
 a) vertically upward  
 b) horizontally  
 c) vertically downward  
 d) both vertically upward and horizontally



- 9) The centre of buoyancy of a submerged body \_\_\_\_\_.  
 a) coincides with the centre of gravity of the body  
 b) coincides with the centroid of the displaced volume of the fluid  
 c) is always below the centre of gravity of the body  
 d) is always above the centroid of the displaced volume of liquid
- 10) The flow field represented by the velocity vector  
 $V = axi + by^2 + cz t^2 k$   
 where a, b and c are constants, is  
 a) three-dimensional and unsteady  
 b) three-dimensional and steady  
 c) two-dimensional and steady  
 d) two-dimensional and unsteady
- 11) Venturi meter is advantageous because \_\_\_\_\_.  
 a) it has much smaller head loss  
 b) its accuracy is quite good  
 c) its coefficient of discharge is more than for an orifice meter  
 d) all the above
- 12) According to Darcy's formula, the loss of head due to friction in the pipe is  
 where  $f$  = coefficient of friction  
 $l$  = length of pipe  
 $V$  = average velocity of liquid in pipe, and  
 $d$  = diameter of pipe  
 a)  $4flV^2 / 2gd$   
 b)  $flV^2 / 2gd$   
 c)  $4flV / 2gd$   
 d)  $4flV^2 / gd$
- 13) For laminar flow in circular pipes, the Darcy's friction factor  $f'$  is equal to  
 where  $Re$  is Reynold's, number \_\_\_\_\_.  
 a)  $16/Re$   
 b)  $32/Re$   
 c)  $64/Re$   
 d) None of the above
- 14) The Buckingham-Pi theorem is widely used in the dimensional analysis  
 and expresses the resulting equation in terms of \_\_\_\_\_.  
 a) the dependent and independent variables  
 b)  $n$  dimensionless parameters  
 c)  $(n - m)$  dimensionless parameters  
 d) geometric, kinematic and dynamic variables

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**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Out of remaining question, attempt any two question from each section.  
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**Section – I**

**Q.2 Solve.**

- a) With neat sketch explain the conditions of the equilibrium for floating body. **04**
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- c) A rectangular plane surface 2 m wide and 3 m deep lies in water in such a way that its plane makes an angle of 30° with the free surface of water. Determine the total pressure and position of centre of pressure when the upper edge is 1.5 m below the free water surface. **05**

**Q.3 Solve.**

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- b) What is venturimeter? Derive an expression for the discharge through venturimeter. **05**
- c) The velocity vector in a fluid flow is given **05**  
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**Q.4 Solve.**

- a) Define the following terms: **04**
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- b) Derive Darcy-Weisbach equation for finding loss of head due to friction in pipes. **05**
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## Section – II

## Q.5 Solve.

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- b) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if co-efficient of friction are .005, .0052 and .0048 respectively by considering: minor losses. 05
- c) The resisting force R of supersonic plane during the flight can be considered as dependent upon the length of aeroplane (l), velocity (v), dynamic viscosity ( $\mu$ ), air density ( $\rho$ ), bulk modulus (K). Express the functional relationship of these variables and the resisting force using Buckingham's  $\pi$ -theorem. 05

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- b) A reaction turbine works at 450 r.p.m. under a head of 120 metres. Its diameter at inlet is 120 cm and the flow area is 0.4 m<sup>2</sup>. The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine:  
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**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The flow field represented by the velocity vector  
 $V = axi + by^2 + czt^2k$   
 where a, b and c are constants, is  
 a) three-dimensional and unsteady  
 b) three-dimensional and steady  
 c) two-dimensional and steady  
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- 2) Venturi meter is advantageous because \_\_\_\_\_.  
 a) it has much smaller head loss  
 b) its accuracy is quite good  
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- 3) According to Darcy's formula, the loss of head due to friction in the pipe is  
 where  $f$  = coefficient of friction  
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 a)  $4flV^2 / 2gd$   
 b)  $flV^2 / 2gd$   
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- 4) For laminar flow in circular pipes, the Darcy's friction factor  $f'$  is equal to  
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- 8) Pelton turbine is \_\_\_\_\_.  
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- 9) In a centrifugal pump, the liquid enters the pump \_\_\_\_\_.  
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**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Out of remaining question, attempt any two question from each section.  
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**Section – I**

**Q.2 Solve.**

- a) With neat sketch explain the conditions of the equilibrium for floating body. **04**
- b) Derive an expression for total pressure and centre of pressure on an inclined plane immersed in a liquid. **05**
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**Q.3 Solve.**

- a) What are different types of fluid flow? Explain with an example. **04**
- b) What is venturimeter? Derive an expression for the discharge through venturimeter. **05**
- c) The velocity vector in a fluid flow is given **05**  
 $V = 4x^3i - 10x^2yj + 2tk$   
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**Q.4 Solve.**

- a) Define the following terms: **04**
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  - 2) Path line
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  - 4) Laminar flow
- b) Derive Darcy-Weisbach equation for finding loss of head due to friction in pipes. **05**
- c) Derive a condition for maximum transmission power through a pipeline. **05**  
 What is efficiency under such conditions?

## Section – II

**Q.5 Solve.**

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- b) A reaction turbine works at 450 r.p.m. under a head of 120 metres. Its diameter at inlet is 120 cm and the flow area is 0.4 m<sup>2</sup>. The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine:  
 1) The volume flow rate,  
 2) The power developed, and  
 3) Hydraulic efficiency.  
 Assume whirl at outlet to be zero. **05**
- c) Explain governing of Pelton wheel. **04**

**Q.7 Solve:**

- a) What is Cavitation? What are its effects on Centrifugal Pumps? What precautions are to be taken against cavitation? **04**
- b) A Kaplan turbine working under a head of 20 m develops 11772 kW shaft power. The outer diameter of the runner is 3.5 m and hub diameter is 1.75 m. The guide blade angle at the extreme edge of the runner is 35°. The hydraulic and overall efficiencies of the turbines are 88% and 84% respectively. If the velocity of whirl is zero at outlet, determine:  
 1) Runner vane angles at inlet and outlet at the extreme edge of the runner, and  
 2) Speed of the turbine **05**
- c) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 r.p.m. works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40° at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm, determine:  
 1) Vane angle at inlet  
 2) Work done by impeller on water per second, and  
 3) Manometric efficiency **05**

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**S. Y. (B.Tech.) (Sem - II) (New)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The motion of a piston in the cylinder of a steam engine is an example of \_\_\_\_\_.  
 a) completely constrained motion  
 b) incompletely constrained motion  
 c) successfully constrained motion  
 d) none of these
- 2) A ball and a socket joint forms a \_\_\_\_\_.  
 a) turning pair  
 b) rolling pair  
 c) sliding pair  
 d) spherical pair
- 3) The direction of linear velocity of any point on a link with respect to another point on the same link is \_\_\_\_\_.  
 a) parallel to the link joining the points  
 b) perpendicular to the link joining the points  
 c) at 45° to the link joining the points  
 d) none of these
- 4) The component of the acceleration, parallel to the velocity of the particle, at the given instant is called \_\_\_\_\_.  
 a) radial component  
 b) Coriolis component  
 c) tangential component  
 d) None of these
- 5) A point B on a rigid link AB moves with respect to A with angular velocity  $\omega$  rad/s. The radial component of the acceleration of B with respect to A, \_\_\_\_\_.  
 a)  $V_{BA} \times AB$   
 b)  $(V_{BA})^2 / AB$   
 c)  $V_{BA} / AB$   
 d) None of these  
 Where,  $V_{BA}$  = Linear velocity of B with respect to A =  $\omega \times AB$
- 6) The size of a cam depends upon \_\_\_\_\_.  
 a) base circle  
 b) pitch circle  
 c) prime circle  
 d) pitch curve
- 7) Offset is provided to a cam follower mechanism to \_\_\_\_\_.  
 a) avoid jerk  
 b) accelerate  
 c) minimize the side thrust  
 d) none of these



- Page 2 of 20

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**S. Y. (B.Tech.) (Sem - II) (New)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Draw neat sketches wherever necessary.  
 5) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain any two inversions of four bar chain with neat sketch. **06**  
**b)** In a pin jointed four bar mechanism, as shown in Fig. I,  $AB = 300$  mm,  $BC = CD = 360$  mm and  $AD = 600$  mm. The angle  $BAD = 60^\circ$ . The crank  $AB$  rotates uniformly at 100 rpm. Locate all the instantaneous centres and find the angular velocity of the link  $BC$ . **08**

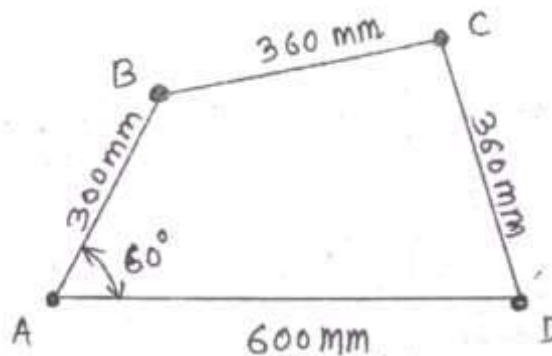


Figure-I

- Q.3 a)** An engine mechanism is shown in Fig. II. The crank  $OB = 100$  mm and the connecting rod  $BC = 300$  mm with centre of gravity  $K$ , 100 mm from  $B$ . In the position shown, the crankshaft has a speed of 75 rad/s and an angular acceleration of  $1200 \text{ rad/s}^2$ . Determine using relative velocity and acceleration method the following. **10**
- 1) Velocity of  $K$
  - 2) Angular velocity of  $CB$
  - 3) Acceleration of  $K$

- 4) Angular acceleration of CB

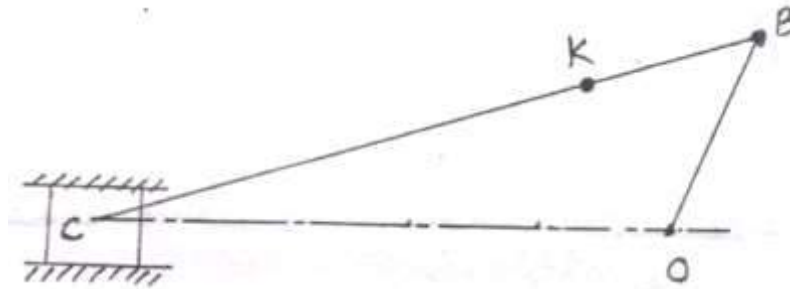


Figure-II

- b) Define kinematic pair and explain types of pairs. 04

- Q.4 a) Define the following terms as applied to cam. 06

- 1) Base circle
- 2) Pitch circle
- 3) Trace point
- 4) Pitch point
- 5) Pressure angle
- 6) Stroke of the follower

- b) A cam is to give the following motion to a knife-edged follower: 08

- 1) Outstroke during  $60^\circ$  of cam rotation;
- 2) Dwell for the next  $30^\circ$  of cam rotation;
- 3) Return stroke during next  $60^\circ$  of cam rotation, and
- 4) Dwell for the remaining  $210^\circ$  of cam rotation

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower passes through the axis of the cam shaft.

### Section – II

- Q.5 a) Differentiate between involute and cycloidal gear tooth profile. 04

- b) An epicyclic gear train, as shown in Fig. III, is composed of a fixed annular 10

wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 rpm about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively.

Find the following:

- 1) Number of teeth on C

- 2) Speed and sense of rotation of C.

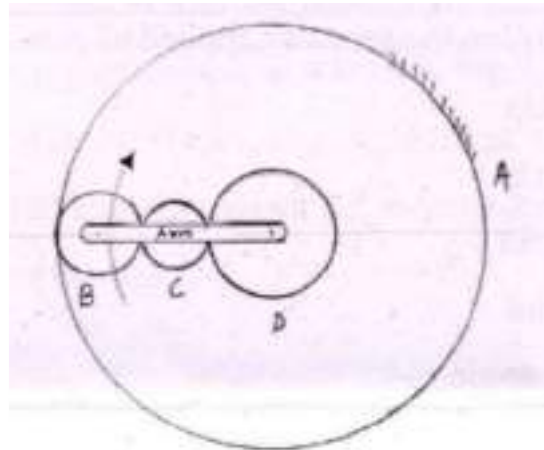


Figure - III

**Fig. III**

- Q.6 a)** A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor. **08**
- b)** Define and explain the following terms relating to governors: **06**
- 1) Stability
  - 2) Sensitiveness
  - 3) Isochronous governor
  - 4) Hunting
  - 5) Effort of a governor
  - 6) Power of a governor
- Q.7 a)** Write a short note on static balancing and dynamic balancing. **04**
- b)** Four masses A, B, C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7 kg and the radii of C and D make angles of  $90^\circ$  and  $240^\circ$  respectively with the radius of B. Find the magnitude of the masses A, C and D and the angular position of A so that the system may be completely balanced. **10**

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**S. Y. (B.Tech.) (Sem - II) (New)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) An imaginary circle which by pure rolling action, gives the same motion as the actual gear, is called \_\_\_\_\_.  
 a) addendum circle                      b) dedendum circle  
 c) clearance circle                      d) pitch circle
- 2) The product of the diametral pitch and circular pitch is equal to \_\_\_\_\_.  
 a) 1                                              b)  $\pi$   
 c)  $1/\pi$                                           d)  $2\pi$
- 3) The condition of correct gearing is \_\_\_\_\_.  
 a) common normal to the pitch surface cuts the line of centers at a fixed point  
 b) radius of curvature of two profiles be same  
 c) pitch line velocities of teeth be same  
 d) none of the above
- 4) The height of a Watt's governor (in meters) is equal to \_\_\_\_\_.  
 a)  $8.95/N^2$                                       b)  $89.5/N^2$   
 c)  $8950/N^2$                                     d)  $895/N^2$   
 where N = Speed of the arm and ball about the spindle axis.
- 5) A Hartnell governor is a \_\_\_\_\_.  
 a) spring loaded governor                      b) pendulum type governor  
 c) dead weight governor                      d) inertia governor
- 6) In order to have a complete balance of the several revolving masses in different planes \_\_\_\_\_.  
 a) the resultant force must be zero  
 b) the resultant couple must be zero  
 c) both the resultant force and couple must be zero  
 d) none of the above



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Set **Q**

**S. Y. (B.Tech.) (Sem - II) (New)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Draw neat sketches wherever necessary.  
 5) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain any two inversions of four bar chain with neat sketch. **06**  
**b)** In a pin jointed four bar mechanism, as shown in Fig. I,  $AB = 300$  mm,  $BC = CD = 360$  mm and  $AD = 600$  mm. The angle  $BAD = 60^\circ$ . The crank  $AB$  rotates uniformly at 100 rpm. Locate all the instantaneous centres and find the angular velocity of the link  $BC$ . **08**

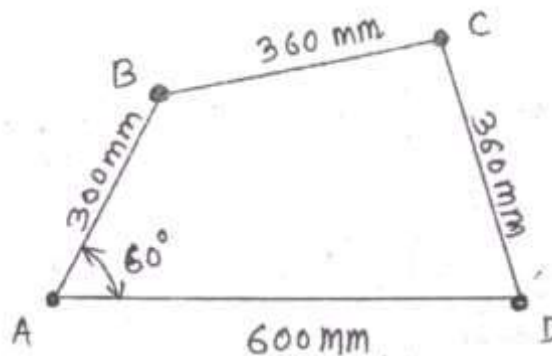


Figure-I

- Q.3 a)** An engine mechanism is shown in Fig. II. The crank  $OB = 100$  mm and the connecting rod  $BC = 300$  mm with centre of gravity  $K$ , 100 mm from  $B$ . In the position shown, the crankshaft has a speed of 75 rad/s and an angular acceleration of  $1200 \text{ rad/s}^2$ . Determine using relative velocity and acceleration method the following. **10**
- 1) Velocity of  $K$
  - 2) Angular velocity of  $CB$
  - 3) Acceleration of  $K$

- 4) Angular acceleration of CB

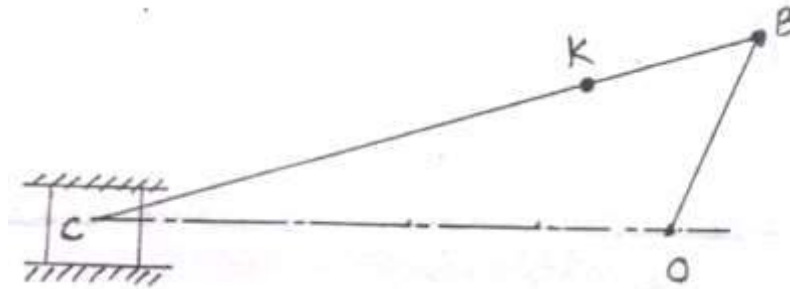


Figure-II

- b) Define kinematic pair and explain types of pairs. 04

- Q.4 a) Define the following terms as applied to cam. 06

- 1) Base circle
- 2) Pitch circle
- 3) Trace point
- 4) Pitch point
- 5) Pressure angle
- 6) Stroke of the follower

- b) A cam is to give the following motion to a knife-edged follower: 08

- 1) Outstroke during  $60^\circ$  of cam rotation;
- 2) Dwell for the next  $30^\circ$  of cam rotation;
- 3) Return stroke during next  $60^\circ$  of cam rotation, and
- 4) Dwell for the remaining  $210^\circ$  of cam rotation

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower passes through the axis of the cam shaft.

### Section – II

- Q.5 a) Differentiate between involute and cycloidal gear tooth profile. 04

- b) An epicyclic gear train, as shown in Fig. III, is composed of a fixed annular 10

wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 rpm about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively.

Find the following:

- 1) Number of teeth on C



- 2) Speed and sense of rotation of C.

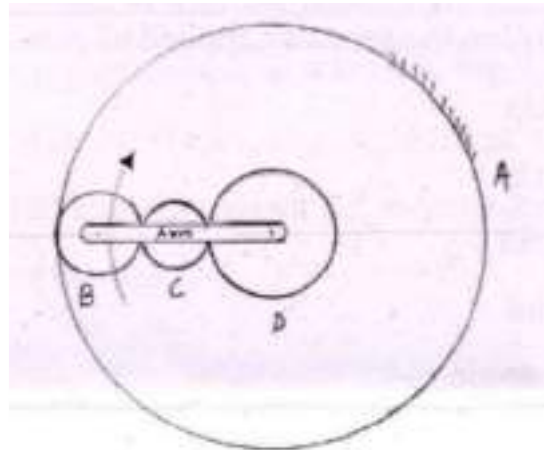


Figure - III

**Fig. III**

- Q.6 a)** A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor. **08**
- b)** Define and explain the following terms relating to governors: **06**
- 1) Stability
  - 2) Sensitiveness
  - 3) Isochronous governor
  - 4) Hunting
  - 5) Effort of a governor
  - 6) Power of a governor
- Q.7 a)** Write a short note on static balancing and dynamic balancing. **04**
- b)** Four masses A, B, C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7 kg and the radii of C and D make angles of  $90^\circ$  and  $240^\circ$  respectively with the radius of B. Find the magnitude of the masses A, C and D and the angular position of A so that the system may be completely balanced. **10**

# R

## Max. Marks: 70

Marks: 14

## 14

- Page 11 of 20

- 7) The direction of linear velocity of any point on a link with respect to another point on the same link is \_\_\_\_\_.  
 a) parallel to the link joining the points  
 b) perpendicular to the link joining the points  
 c) at  $45^\circ$  to the link joining the points  
 d) none of these
- 8) The component of the acceleration, parallel to the velocity of the particle, at the given instant is called \_\_\_\_\_.  
 a) radial component  
 b) Coriolis component  
 c) tangential component  
 d) None of these
- 9) A point B on a rigid link AB moves with respect to A with angular velocity  $\omega$  rad/s. The radial component of the acceleration of B with respect to A, \_\_\_\_\_.  
 a)  $V_{BA} \times AB$   
 b)  $(V_{BA})^2 / AB$   
 c)  $V_{BA} / AB$   
 d) None of these
- Where,  $V_{BA}$  = Linear velocity of B with respect to A =  $\omega \times AB$
- 10) The size of a cam depends upon \_\_\_\_\_.  
 a) base circle  
 b) pitch circle  
 c) prime circle  
 d) pitch curve
- 11) Offset is provided to a cam follower mechanism to \_\_\_\_\_.  
 a) avoid jerk  
 b) accelerate  
 c) minimize the side thrust  
 d) none of these
- 12) An imaginary circle which by pure rolling action, gives the same motion as the actual gear, is called \_\_\_\_\_.  
 a) addendum circle  
 b) dedendum circle  
 c) clearance circle  
 d) pitch circle
- 13) The product of the diametral pitch and circular pitch is equal to \_\_\_\_\_.  
 a) 1  
 b)  $\pi$   
 c)  $1/\pi$   
 d)  $2\pi$
- 14) The condition of correct gearing is \_\_\_\_\_.  
 a) common normal to the pitch surface cuts the line of centers at a fixed point  
 b) radius of curvature of two profiles be same  
 c) pitch line velocities of teeth be same  
 d) none of the above

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**S. Y. (B.Tech.) (Sem - II) (New)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

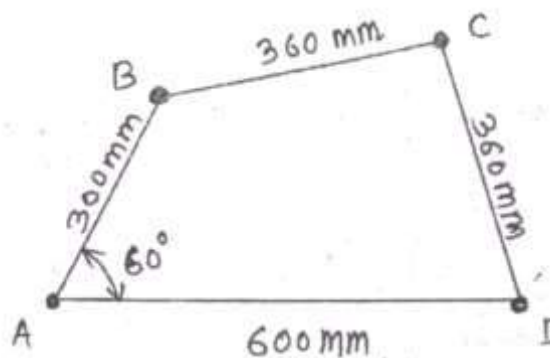
Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Draw neat sketches wherever necessary.  
 5) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain any two inversions of four bar chain with neat sketch. **06**  
**b)** In a pin jointed four bar mechanism, as shown in Fig. I,  $AB = 300$  mm,  $BC = CD = 360$  mm and  $AD = 600$  mm. The angle  $BAD = 60^\circ$ . The crank  $AB$  rotates uniformly at 100 rpm. Locate all the instantaneous centres and find the angular velocity of the link  $BC$ . **08**



- Q.3 a)** An engine mechanism is shown in Fig. II. The crank  $OB = 100$  mm and the connecting rod  $BC = 300$  mm with centre of gravity  $K$ , 100 mm from  $B$ . In the position shown, the crankshaft has a speed of 75 rad/s and an angular acceleration of  $1200 \text{ rad/s}^2$ . Determine using relative velocity and acceleration method the following. **10**
- 1) Velocity of  $K$
  - 2) Angular velocity of  $CB$
  - 3) Acceleration of  $K$

- 4) Angular acceleration of CB

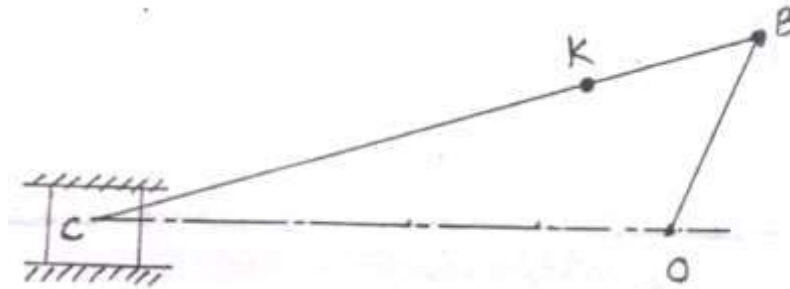


Figure-II

- b) Define kinematic pair and explain types of pairs. 04

- Q.4 a) Define the following terms as applied to cam. 06

- 1) Base circle
- 2) Pitch circle
- 3) Trace point
- 4) Pitch point
- 5) Pressure angle
- 6) Stroke of the follower

- b) A cam is to give the following motion to a knife-edged follower: 08

- 1) Outstroke during  $60^\circ$  of cam rotation;
- 2) Dwell for the next  $30^\circ$  of cam rotation;
- 3) Return stroke during next  $60^\circ$  of cam rotation, and
- 4) Dwell for the remaining  $210^\circ$  of cam rotation

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower passes through the axis of the cam shaft.

### Section – II

- Q.5 a) Differentiate between involute and cycloidal gear tooth profile. 04

- b) An epicyclic gear train, as shown in Fig. III, is composed of a fixed annular 10

wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 rpm about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively.

Find the following:

- 1) Number of teeth on C

- 2) Speed and sense of rotation of C.

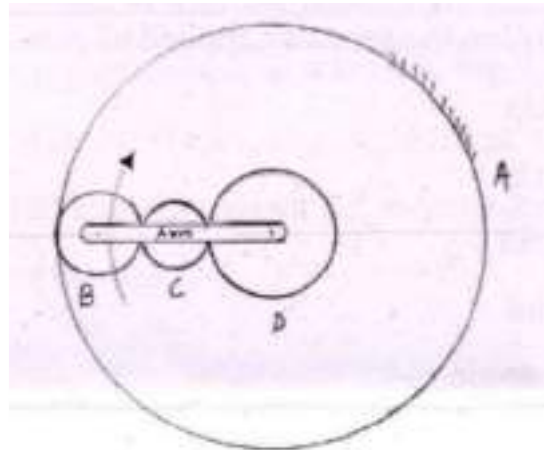


Figure - III

**Fig. III**

- Q.6 a)** A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor. **08**
- b)** Define and explain the following terms relating to governors: **06**
- 1) Stability
  - 2) Sensitiveness
  - 3) Isochronous governor
  - 4) Hunting
  - 5) Effort of a governor
  - 6) Power of a governor
- Q.7 a)** Write a short note on static balancing and dynamic balancing. **04**
- b)** Four masses A, B, C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7 kg and the radii of C and D make angles of  $90^\circ$  and  $240^\circ$  respectively with the radius of B. Find the magnitude of the masses A, C and D and the angular position of A so that the system may be completely balanced. **10**

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Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

Marks: 14

14

- Page 16 of 20

- 8) In order to have a complete balance of the several revolving masses in different planes \_\_\_\_\_.  
 a) the resultant force must be zero  
 b) the resultant couple must be zero  
 c) both the resultant force and couple must be zero  
 d) none of the above
- 9) A disturbing mass  $m_1$  attached to a rotating shaft may be balanced by a single mass  $m_2$  attached in the same plane of rotation as that of  $m_1$  such that \_\_\_\_\_.  
 a)  $m_1 \cdot r_2 = m_2 \cdot r_1$   
 b)  $m_1 \cdot r_1 = m_2 \cdot r_2$   
 c)  $m_1 \cdot m_2 = r_1 \cdot r_2$   
 d) None of the above
- 10) The motion of a piston in the cylinder of a steam engine is an example of \_\_\_\_\_.  
 a) completely constrained motion  
 b) incompletely constrained motion  
 c) successfully constrained motion  
 d) none of these
- 11) A ball and a socket joint forms a \_\_\_\_\_.  
 a) turning pair  
 b) rolling pair  
 c) sliding pair  
 d) spherical pair
- 12) The direction of linear velocity of any point on a link with respect to another point on the same link is \_\_\_\_\_.  
 a) parallel to the link joining the points  
 b) perpendicular to the link joining the points  
 c) at  $45^\circ$  to the link joining the points  
 d) none of these
- 13) The component of the acceleration, parallel to the velocity of the particle, at the given instant is called \_\_\_\_\_.  
 a) radial component  
 b) Coriolis component  
 c) tangential component  
 d) None of these
- 14) A point B on a rigid link AB moves with respect to A with angular velocity  $\omega$  rad/s. The radial component of the acceleration of B with respect to A, \_\_\_\_\_.  
 a)  $V_{BA} \times AB$   
 b)  $(V_{BA})^2 / AB$   
 c)  $V_{BA} / AB$   
 d) None of these

Where,  $V_{BA}$  = Linear velocity of B with respect to A =  $\omega \times AB$



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Set **S**

**S. Y. (B.Tech.) (Sem - II) (New)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Draw neat sketches wherever necessary.  
 5) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain any two inversions of four bar chain with neat sketch. **06**  
**b)** In a pin jointed four bar mechanism, as shown in Fig. I,  $AB = 300$  mm,  $BC = CD = 360$  mm and  $AD = 600$  mm. The angle  $BAD = 60^\circ$ . The crank  $AB$  rotates uniformly at 100 rpm. Locate all the instantaneous centres and find the angular velocity of the link  $BC$ . **08**

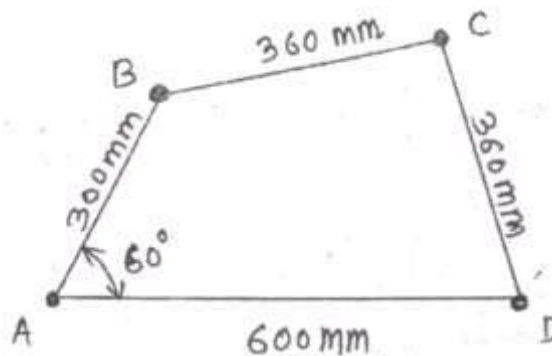


Figure-I

- Q.3 a)** An engine mechanism is shown in Fig. II. The crank  $OB = 100$  mm and the connecting rod  $BC = 300$  mm with centre of gravity  $K$ , 100 mm from  $B$ . In the position shown, the crankshaft has a speed of 75 rad/s and an angular acceleration of  $1200 \text{ rad/s}^2$ . Determine using relative velocity and acceleration method the following. **10**
- 1) Velocity of  $K$
  - 2) Angular velocity of  $CB$
  - 3) Acceleration of  $K$

- 4) Angular acceleration of CB

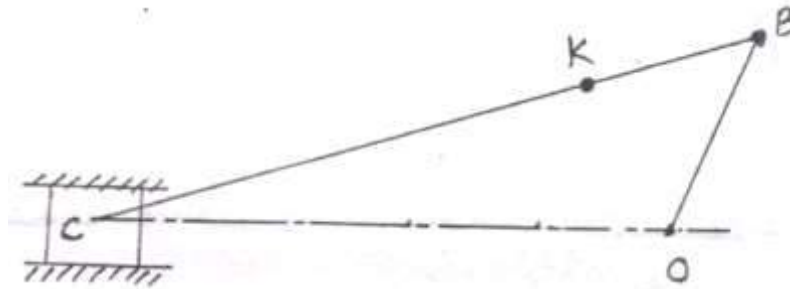


Figure-II

- b) Define kinematic pair and explain types of pairs. 04

- Q.4 a) Define the following terms as applied to cam. 06

- 1) Base circle
- 2) Pitch circle
- 3) Trace point
- 4) Pitch point
- 5) Pressure angle
- 6) Stroke of the follower

- b) A cam is to give the following motion to a knife-edged follower: 08

- 1) Outstroke during  $60^\circ$  of cam rotation;
- 2) Dwell for the next  $30^\circ$  of cam rotation;
- 3) Return stroke during next  $60^\circ$  of cam rotation, and
- 4) Dwell for the remaining  $210^\circ$  of cam rotation

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower passes through the axis of the cam shaft.

### Section – II

- Q.5 a) Differentiate between involute and cycloidal gear tooth profile. 04

- b) An epicyclic gear train, as shown in Fig. III, is composed of a fixed annular 10

wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 rpm about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively.

Find the following:

- 1) Number of teeth on C

- 2) Speed and sense of rotation of C.

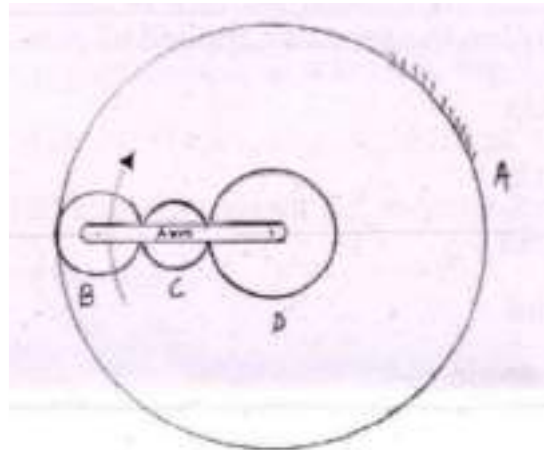


Figure - III

**Fig. III**

- Q.6 a)** A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor. **08**
- b)** Define and explain the following terms relating to governors: **06**
- 1) Stability
  - 2) Sensitiveness
  - 3) Isochronous governor
  - 4) Hunting
  - 5) Effort of a governor
  - 6) Power of a governor
- Q.7 a)** Write a short note on static balancing and dynamic balancing. **04**
- b)** Four masses A, B, C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7 kg and the radii of C and D make angles of  $90^\circ$  and  $240^\circ$  respectively with the radius of B. Find the magnitude of the masses A, C and D and the angular position of A so that the system may be completely balanced. **10**

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Where and when was the word Mechatronics invented?
 

|                  |                  |
|------------------|------------------|
| a) Japan (1960)  | b) Japan (1980)  |
| c) Europe (1960) | d) Europe (1980) |
- 2) A servo motor is a typical example of \_\_\_\_\_.
 

|                       |                        |
|-----------------------|------------------------|
| a) Electronics system | b) Mechanical system   |
| c) Computer system    | d) Mechatronics system |
- 3) What is the function of an input signal conditioning unit?
 

|                                                           |
|-----------------------------------------------------------|
| a) To produce control signals                             |
| b) To amplify the signal and convert it into digital form |
| c) To perform mechanical work                             |
| d) To produce electrical signals                          |
- 4) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.
 

|                                     |
|-------------------------------------|
| a) Mutual Inductance                |
| b) Self Inductance                  |
| c) Variable Resistance Transduction |
| d) Hall Effect                      |
- 5) LIDAR stands for \_\_\_\_\_.
 

|                                  |
|----------------------------------|
| a) Light Detection and Radiation |
| b) Light Detection and Ranging   |
| c) Lithium Detector and Radiator |
| d) Lithium Detection and Ranging |
- 6) A microcontroller at-least should consist of \_\_\_\_\_.
 

|                                        |
|----------------------------------------|
| a) RAM, ROM, I/O ports and timers      |
| b) CPU, RAM, I/O ports and timers      |
| c) CPU, RAM, ROM, I/O ports and timers |
| d) CPU, ROM, I/O ports and timers      |
- 7) Unlike microprocessors, microcontrollers make use of batteries because they have:
 

|                            |                            |
|----------------------------|----------------------------|
| a) high power dissipation  | b) low power consumption   |
| c) low voltage consumption | d) low current consumption |

- 8) Which is a false statement regarding DAQ (Data acquisition) systems?
- a) It can measure physical phenomenon which can be sampled
  - b) Signal conditioning can be done
  - c) DAQ system can generate its own physical sample sets
  - d) Analog to digital conversion can be done
- 9) Which conversion takes place when music is played from a memory card?
- a) AAC
  - b) ADC
  - c) DDC
  - d) DAC
- 10) Which is not a property of group drive?
- a) Less initial cost than individual drive
  - b) Less maintenance cost than individual drive
  - c) Low power factor
  - d) Provides constant motor speed
- 11) IEEE 488 is more commonly known as:
- a) GPIB
  - b) PCI Express
  - c) FireWire
  - d) Serial ATA
- 12) The programmable logic controllers are used in \_\_\_\_.
- a) Manufacturing
  - b) Automation
  - c) Both a and b
  - d) None of the above
- 13) What are the components that make the programmable logic controller work?
- a) Input and output module
  - b) CPU
  - c) Power supply
  - d) All of the above
- 14) Which transmission media provides the highest transmission speed in a network?
- a) coaxial cable
  - b) twisted pair cable
  - c) optical fiber
  - d) electrical cable

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| <b>Set</b> | <b>P</b> |
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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from Section-I and Section-II.  
2) Figures to the right indicate full marks.

**Section – I**

- |            |                                                                                         |           |
|------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Explain key elements of mechatronic system.                                   | <b>07</b> |
|            | <b>b)</b> Explain application of mechatronics in car engine management.                 | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain classification of sensors.                                            | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch linear and rotary variable differential transformer. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain features of 8085 microprocessor.                                      | <b>07</b> |
|            | <b>b)</b> Differentiate between microprocessor and microcontroller.                     | <b>07</b> |

**Section – II**

- |            |                                                                                                                 |           |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> What is meant by signal conditioning and what are the different types of signal conditioner?          | <b>07</b> |
|            | <b>b)</b> Explain signal processing. How signal processing is done and write applications of signal processing. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain basic architecture of PLC.                                                                    | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch NPN and PNP sourcing and sinking circuits.                                   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> What is computer network? Explain key components of computer networks.                                | <b>07</b> |
|            | <b>b)</b> Define Network Topology. Explain any two network topologies.                                          | <b>07</b> |

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**Set Q**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which is a false statement regarding DAQ (Data acquisition) systems?
  - a) It can measure physical phenomenon which can be sampled
  - b) Signal conditioning can be done
  - c) DAQ system can generate its own physical sample sets
  - d) Analog to digital conversion can be done
- 2) Which conversion takes place when music is played from a memory card?
  - a) AAC
  - b) ADC
  - c) DDC
  - d) DAC
- 3) Which is not a property of group drive?
  - a) Less initial cost than individual drive
  - b) Less maintenance cost than individual drive
  - c) Low power factor
  - d) Provides constant motor speed
- 4) IEEE 488 is more commonly known as:
  - a) GPIB
  - b) PCI Express
  - c) FireWire
  - d) Serial ATA
- 5) The programmable logic controllers are used in \_\_\_\_\_.
  - a) Manufacturing
  - b) Automation
  - c) Both a and b
  - d) None of the above
- 6) What are the components that make the programmable logic controller work?
  - a) Input and output module
  - b) CPU
  - c) Power supply
  - d) All of the above
- 7) Which transmission media provides the highest transmission speed in a network?
  - a) coaxial cable
  - b) twisted pair cable
  - c) optical fiber
  - d) electrical cable
- 8) Where and when was the word Mechatronics invented?
  - a) Japan (1960)
  - b) Japan (1980)
  - c) Europe (1960)
  - d) Europe (1980)

- 9) A servo motor is a typical example of \_\_\_\_\_.  
a) Electronics system                      b) Mechanical system  
c) Computer system                        d) Mechatronics system
- 10) What is the function of an input signal conditioning unit?  
a) To produce control signals  
b) To amplify the signal and convert it into digital form  
c) To perform mechanical work  
d) To produce electrical signals
- 11) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.  
a) Mutual Inductance  
b) Self Inductance  
c) Variable Resistance Transduction  
d) Hall Effect
- 12) LIDAR stands for \_\_\_\_\_.  
a) Light Detection and Radiation  
b) Light Detection and Ranging  
c) Lithium Detector and Radiator  
d) Lithium Detection and Ranging
- 13) A microcontroller at-least should consist of \_\_\_\_\_.  
a) RAM, ROM, I/O ports and timers  
b) CPU, RAM, I/O ports and timers  
c) CPU, RAM, ROM, I/O ports and timers  
d) CPU, ROM, I/O ports and timers
- 14) Unlike microprocessors, microcontrollers make use of batteries because they have:  
a) high power dissipation                      b) low power consumption  
c) low voltage consumption                    d) low current consumption



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**Set Q**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from Section-I and Section-II.  
 2) Figures to the right indicate full marks.

**Section – I**

- |            |                                                                                         |           |
|------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Explain key elements of mechatronic system.                                   | <b>07</b> |
|            | <b>b)</b> Explain application of mechatronics in car engine management.                 | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain classification of sensors.                                            | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch linear and rotary variable differential transformer. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain features of 8085 microprocessor.                                      | <b>07</b> |
|            | <b>b)</b> Differentiate between microprocessor and microcontroller.                     | <b>07</b> |

**Section – II**

- |            |                                                                                                                 |           |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> What is meant by signal conditioning and what are the different types of signal conditioner?          | <b>07</b> |
|            | <b>b)</b> Explain signal processing. How signal processing is done and write applications of signal processing. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain basic architecture of PLC.                                                                    | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch NPN and PNP sourcing and sinking circuits.                                   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> What is computer network? Explain key components of computer networks.                                | <b>07</b> |
|            | <b>b)</b> Define Network Topology. Explain any two network topologies.                                          | <b>07</b> |

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Set **R**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) IEEE 488 is more commonly known as:
  - a) GPIB
  - b) PCI Express
  - c) FireWire
  - d) Serial ATA
- 2) The programmable logic controllers are used in \_\_\_\_\_.
  - a) Manufacturing
  - b) Automation
  - c) Both a and b
  - d) None of the above
- 3) What are the components that make the programmable logic controller work?
  - a) Input and output module
  - b) CPU
  - c) Power supply
  - d) All of the above
- 4) Which transmission media provides the highest transmission speed in a network?
  - a) coaxial cable
  - b) twisted pair cable
  - c) optical fiber
  - d) electrical cable
- 5) Where and when was the word Mechatronics invented?
  - a) Japan (1960)
  - b) Japan (1980)
  - c) Europe (1960)
  - d) Europe (1980)
- 6) A servo motor is a typical example of \_\_\_\_\_.
  - a) Electronics system
  - b) Mechanical system
  - c) Computer system
  - d) Mechatronics system
- 7) What is the function of an input signal conditioning unit?
  - a) To produce control signals
  - b) To amplify the signal and convert it into digital form
  - c) To perform mechanical work
  - d) To produce electrical signals
- 8) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.
  - a) Mutual Inductance
  - b) Self Inductance
  - c) Variable Resistance Transduction
  - d) Hall Effect

- 9) LIDAR stands for \_\_\_\_\_.  
a) Light Detection and Radiation  
b) Light Detection and Ranging  
c) Lithium Detector and Radiator  
d) Lithium Detection and Ranging
- 10) A microcontroller at-least should consist of \_\_\_\_\_.  
a) RAM, ROM, I/O ports and timers  
b) CPU, RAM, I/O ports and timers  
c) CPU, RAM, ROM, I/O ports and timers  
d) CPU, ROM, I/O ports and timers
- 11) Unlike microprocessors, microcontrollers make use of batteries because they have:  
a) high power dissipation                      b) low power consumption  
c) low voltage consumption                      d) low current consumption
- 12) Which is a false statement regarding DAQ (Data acquisition) systems?  
a) It can measure physical phenomenon which can be sampled  
b) Signal conditioning can be done  
c) DAQ system can generate its own physical sample sets  
d) Analog to digital conversion can be done
- 13) Which conversion takes place when music is played from a memory card?  
a) AAC                                              b) ADC  
c) DDC                                              d) DAC
- 14) Which is not a property of group drive?  
a) Less initial cost than individual drive  
b) Less maintenance cost than individual drive  
c) Low power factor  
d) Provides constant motor speed

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from Section-I and Section-II.  
2) Figures to the right indicate full marks.

**Section – I**

- |            |                                                                                         |           |
|------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Explain key elements of mechatronic system.                                   | <b>07</b> |
|            | <b>b)</b> Explain application of mechatronics in car engine management.                 | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain classification of sensors.                                            | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch linear and rotary variable differential transformer. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain features of 8085 microprocessor.                                      | <b>07</b> |
|            | <b>b)</b> Differentiate between microprocessor and microcontroller.                     | <b>07</b> |

**Section – II**

- |            |                                                                                                                 |           |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> What is meant by signal conditioning and what are the different types of signal conditioner?          | <b>07</b> |
|            | <b>b)</b> Explain signal processing. How signal processing is done and write applications of signal processing. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain basic architecture of PLC.                                                                    | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch NPN and PNP sourcing and sinking circuits.                                   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> What is computer network? Explain key components of computer networks.                                | <b>07</b> |
|            | <b>b)</b> Define Network Topology. Explain any two network topologies.                                          | <b>07</b> |

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A microcontroller at-least should consist of \_\_\_\_\_.  
 a) RAM, ROM, I/O ports and timers  
 b) CPU, RAM, I/O ports and timers  
 c) CPU, RAM, ROM, I/O ports and timers  
 d) CPU, ROM, I/O ports and timers
- 2) Unlike microprocessors, microcontrollers make use of batteries because they have:  
 a) high power dissipation                      b) low power consumption  
 c) low voltage consumption                      d) low current consumption
- 3) Which is a false statement regarding DAQ (Data acquisition) systems?  
 a) It can measure physical phenomenon which can be sampled  
 b) Signal conditioning can be done  
 c) DAQ system can generate its own physical sample sets  
 d) Analog to digital conversion can be done
- 4) Which conversion takes place when music is played from a memory card?  
 a) AAC                                                      b) ADC  
 c) DDC                                                      d) DAC
- 5) Which is not a property of group drive?  
 a) Less initial cost than individual drive  
 b) Less maintenance cost than individual drive  
 c) Low power factor  
 d) Provides constant motor speed
- 6) IEEE 488 is more commonly known as:  
 a) GPIB                                                      b) PCI Express  
 c) FireWire                                                      d) Serial ATA
- 7) The programmable logic controllers are used in \_\_\_\_\_.  
 a) Manufacturing                                                      b) Automation  
 c) Both a and b                                                      d) None of the above

- 8) What are the components that make the programmable logic controller work?
- a) Input and output module
  - b) CPU
  - c) Power supply
  - d) All of the above
- 9) Which transmission media provides the highest transmission speed in a network?
- a) coaxial cable
  - b) twisted pair cable
  - c) optical fiber
  - d) electrical cable
- 10) Where and when was the word Mechatronics invented?
- a) Japan (1960)
  - b) Japan (1980)
  - c) Europe (1960)
  - d) Europe (1980)
- 11) A servo motor is a typical example of \_\_\_\_\_.
- a) Electronics system
  - b) Mechanical system
  - c) Computer system
  - d) Mechatronics system
- 12) What is the function of an input signal conditioning unit?
- a) To produce control signals
  - b) To amplify the signal and convert it into digital form
  - c) To perform mechanical work
  - d) To produce electrical signals
- 13) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.
- a) Mutual Inductance
  - b) Self Inductance
  - c) Variable Resistance Transduction
  - d) Hall Effect
- 14) LIDAR stands for \_\_\_\_\_.
- a) Light Detection and Radiation
  - b) Light Detection and Ranging
  - c) Lithium Detector and Radiator
  - d) Lithium Detection and Ranging

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**Set S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from Section-I and Section-II.  
2) Figures to the right indicate full marks.

**Section – I**

- |            |                                                                                         |           |
|------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Explain key elements of mechatronic system.                                   | <b>07</b> |
|            | <b>b)</b> Explain application of mechatronics in car engine management.                 | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain classification of sensors.                                            | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch linear and rotary variable differential transformer. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain features of 8085 microprocessor.                                      | <b>07</b> |
|            | <b>b)</b> Differentiate between microprocessor and microcontroller.                     | <b>07</b> |

**Section – II**

- |            |                                                                                                                 |           |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> What is meant by signal conditioning and what are the different types of signal conditioner?          | <b>07</b> |
|            | <b>b)</b> Explain signal processing. How signal processing is done and write applications of signal processing. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain basic architecture of PLC.                                                                    | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch NPN and PNP sourcing and sinking circuits.                                   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> What is computer network? Explain key components of computer networks.                                | <b>07</b> |
|            | <b>b)</b> Define Network Topology. Explain any two network topologies.                                          | <b>07</b> |

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| Set P |
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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant and Energy Engineering**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A load curve is a plot of \_\_\_\_\_.  
 a) Load versus generation capacity  
 b) Load versus current  
 c) Load versus cost of power  
 d) Load versus time
- 2) An Inspection survey and analysis of energy flows for energy conservation in a building is called as \_\_\_\_\_.  
 a) Energy Management  
 b) Energy Audit  
 c) Energy Conservation  
 d) None of above
- 3) The solar constant value is \_\_\_\_\_.  
 a) 1327 W/m<sup>2</sup>  
 b) 1366 W/m<sup>2</sup>  
 c) 1357 W/m<sup>2</sup>  
 d) 1377 W/m<sup>2</sup>
- 4) Which of the following power plant have longest physical life?  
 a) Thermal power plant  
 b) Nuclear power plant  
 c) Hydroelectric power plant  
 d) Diesel power plant
- 5) In hydroelectric power, what is necessary for the production of power throughout the Year?  
 a) Dams filled with water  
 b) High amount of air  
 c) High intense sunlight  
 d) Nuclear power
- 6) A system has a connected load of 100 kW, the peak load of 80 kW. base load of 20 kW and an average load of 40 kW, will have a load factor of \_\_\_\_\_.  
 a) 40%  
 b) 50%  
 c) 60%  
 d) 80%
- 7) What does WECS stands for?  
 a) Wind energy conversion system  
 b) Wind engine control system  
 c) Wind energy combined system  
 d) Wind engine comparison system



- 8) Energy conservation act was formed in the year \_\_\_\_\_.
  - a) 1998
  - b) 1999
  - c) 2001
  - d) 2000
- 9) The Function of solar collectors to convert \_\_\_\_\_.
  - a) Solar energy into electricity
  - b) Solar energy into radiations
  - c) Solar energy into thermal energy
  - d) none of these
- 10) What is hot molten rock called?
  - a) Lava
  - b) Magma
  - c) Igneous rocks
  - d) Volcano
- 11) Which of the following power plant cannot be used as a base load plant?
  - a) Hydroelectric power plant
  - b) Diesel elected plant
  - c) Nuclear power plant
  - d) Thermal power plant
- 12) Kinetic energy that results from the oscillation of water is called \_\_\_\_\_.
  - a) Wave energy
  - b) Tidal energy
  - c) Ocean thermal energy
  - d) Hydro energy
- 13) Economiser is used to heat \_\_\_\_\_.
  - a) Feed water
  - b) Air
  - c) Flue gases
  - d) All of the above
- 14) Which Meter is used to measure the Beam Radiations?
  - a) Pyrliometer
  - b) Sunshine Recorder
  - c) Anemometer
  - d) All of the above

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P

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Power Plant and Energy Engineering**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Assume additional suitable data, if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the different types of Load Curves? Explain any one in detail with a neat sketch. **05**  
 b) What is Tariff? Explain any one Tariff Method. **05**  
 c) Explain in short Straight Line Method of Depreciation with figure. **04**
- Q.3** a) Explain the role of NTPC and NPCIL in Power Development. **05**  
 b) Write a short note on the role of Power Grid Corporation in India (PGCIL). **04**  
 c) Explain the requirement of Compressed Air Storage Plants. **05**
- Q.4** a) What are the various factors considered during Selection of Site for Power Station? **05**  
 b) The load supplied by a power station is given below: **05**

| Time (Hr.) | 0 - 6 | 6 - 12 | 12 - 14 | 14 - 18 | 18 - 24 |
|------------|-------|--------|---------|---------|---------|
| Load (MW)  | 35    | 90     | 70      | 100     | 50      |

Draw the load curve & load duration curve. Determine plant capacity factor if plant capacity is 150 MW.

- c) Explain in short the role of the Private Sector in India for Power development. **04**

**Section – II**

- Q.5** a) Write a short note on Pyranometer. **05**  
 b) What is the role of energy audit in energy conservation? **04**  
 c) What is Tidal Energy? Explain Single Basin System Tidal Power Plant. **05**
- Q.6** a) What are the types of Energy Audit? Explain any one in detail. **05**  
 b) What are the Non-concentrating types Collectors? Explain Liquid Flat Plate Collector with a neat sketch. **05**  
 c) Explain with a neat sketch Closed OTEC Cycle Power Plant. **04**

- Q.7**
- |           |                                                                              |           |
|-----------|------------------------------------------------------------------------------|-----------|
| <b>a)</b> | Give a list and explain in short different energy audit instruments.         | <b>05</b> |
| <b>b)</b> | Give classification of wind mill and state its advantages and disadvantages. | <b>05</b> |
| <b>c)</b> | Define the following terms with neat sketch:                                 | <b>04</b> |
|           | 1) Latitude                                                                  |           |
|           | 2) Hour Angle                                                                |           |
|           | 3) Altitude                                                                  |           |
|           | 4) Solar Azimuth Angle                                                       |           |

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- 9) An Inspection survey and analysis of energy flows for energy conservation in a building is called as \_\_\_\_\_.  
a) Energy Management                      b) Energy Audit  
c) Energy Conservation                    d) None of above
- 10) The solar constant value is \_\_\_\_\_.  
a)  $1327 \text{ W/m}^2$                               b)  $1366 \text{ W/m}^2$   
c)  $1357 \text{ W/m}^2$                               d)  $1377 \text{ W/m}^2$
- 11) Which of the following power plant have longest physical life?  
a) Thermal power plant                      b) Nuclear power plant  
c) Hydroelectric power plant                d) Diesel power plant
- 12) In hydroelectric power, what is necessary for the production of power throughout the Year?  
a) Dams filled with water                    b) High amount of air  
c) High intense sunlight                      d) Nuclear power
- 13) A system has a connected load of 100 kW, the peak load of 80 kW. base load of 20 kW and an average load of 40 kW, will have a load factor of \_\_\_\_\_.  
a) 40%                                              b) 50%  
c) 60%                                              d) 80%
- 14) What does WECS stands for?  
a) Wind energy conversion system  
b) Wind engine control system  
c) Wind energy combined system  
d) Wind engine comparison system

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Set **Q**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant and Energy Engineering**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Assume additional suitable data, if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the different types of Load Curves? Explain any one in detail with a neat sketch. **05**  
 b) What is Tariff? Explain any one Tariff Method. **05**  
 c) Explain in short Straight Line Method of Depreciation with figure. **04**
- Q.3** a) Explain the role of NTPC and NPCIL in Power Development. **05**  
 b) Write a short note on the role of Power Grid Corporation in India (PGCIL). **04**  
 c) Explain the requirement of Compressed Air Storage Plants. **05**
- Q.4** a) What are the various factors considered during Selection of Site for Power Station? **05**  
 b) The load supplied by a power station is given below: **05**

| Time (Hr.) | 0 - 6 | 6 - 12 | 12 - 14 | 14 - 18 | 18 - 24 |
|------------|-------|--------|---------|---------|---------|
| Load (MW)  | 35    | 90     | 70      | 100     | 50      |

Draw the load curve & load duration curve. Determine plant capacity factor if plant capacity is 150 MW.

- c) Explain in short the role of the Private Sector in India for Power development. **04**

**Section – II**

- Q.5** a) Write a short note on Pyranometer. **05**  
 b) What is the role of energy audit in energy conservation? **04**  
 c) What is Tidal Energy? Explain Single Basin System Tidal Power Plant. **05**
- Q.6** a) What are the types of Energy Audit? Explain any one in detail. **05**  
 b) What are the Non-concentrating types Collectors? Explain Liquid Flat Plate Collector with a neat sketch. **05**  
 c) Explain with a neat sketch Closed OTEC Cycle Power Plant. **04**

- Q.7**
- |           |                                                                              |           |
|-----------|------------------------------------------------------------------------------|-----------|
| <b>a)</b> | Give a list and explain in short different energy audit instruments.         | <b>05</b> |
| <b>b)</b> | Give classification of wind mill and state its advantages and disadvantages. | <b>05</b> |
| <b>c)</b> | Define the following terms with neat sketch:                                 | <b>04</b> |
|           | 1) Latitude                                                                  |           |
|           | 2) Hour Angle                                                                |           |
|           | 3) Altitude                                                                  |           |
|           | 4) Solar Azimuth Angle                                                       |           |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant and Energy Engineering**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following power plant cannot be used as a base load plant?
 

|                              |                         |
|------------------------------|-------------------------|
| a) Hydroelectric power plant | b) Diesel elected plant |
| c) Nuclear power plant       | d) Thermal power plant  |
- 2) Kinetic energy that results from the oscillation of water is called \_\_\_\_\_.
 

|                         |                 |
|-------------------------|-----------------|
| a) Wave energy          | b) Tidal energy |
| c) Ocean thermal energy | d) Hydro energy |
- 3) Economiser is used to heat \_\_\_\_\_.
 

|               |                     |
|---------------|---------------------|
| a) Feed water | b) Air              |
| c) Flue gases | d) All of the above |
- 4) Which Meter is used to measure the Beam Radiations?
 

|                  |                      |
|------------------|----------------------|
| a) Pyrheliometer | b) Sunshine Recorder |
| c) Anemometer    | d) All of the above  |
- 5) A load curve is a plot of \_\_\_\_\_.
 

|                                    |
|------------------------------------|
| a) Load versus generation capacity |
| b) Load versus current             |
| c) Load versus cost of power       |
| d) Load versus time                |
- 6) An Inspection survey and analysis of energy flows for energy conservation in a building is called as \_\_\_\_\_.
 

|                        |                  |
|------------------------|------------------|
| a) Energy Management   | b) Energy Audit  |
| c) Energy Conservation | d) None of above |
- 7) The solar constant value is \_\_\_\_\_.
 

|                          |                          |
|--------------------------|--------------------------|
| a) 1327 W/m <sup>2</sup> | b) 1366 W/m <sup>2</sup> |
| c) 1357 W/m <sup>2</sup> | d) 1377 W/m <sup>2</sup> |
- 8) Which of the following power plant have longest physical life?
 

|                              |                        |
|------------------------------|------------------------|
| a) Thermal power plant       | b) Nuclear power plant |
| c) Hydroelectric power plant | d) Diesel power plant  |



- 9) In hydroelectric power, what is necessary for the production of power throughout the Year?
- |                           |                       |
|---------------------------|-----------------------|
| a) Dams filled with water | b) High amount of air |
| c) High intense sunlight  | d) Nuclear power      |
- 10) A system has a connected load of 100 kW, the peak load of 80 kW. base load of 20 kW and an average load of 40 kW, will have a load factor of \_\_\_\_.
- |        |        |
|--------|--------|
| a) 40% | b) 50% |
| c) 60% | d) 80% |
- 11) What does WECS stands for?
- |                                  |                                  |
|----------------------------------|----------------------------------|
| a) Wind energy conversion system | b) Wind engine control system    |
| c) Wind energy combined system   | d) Wind engine comparison system |
- 12) Energy conservation act was formed in the year \_\_\_\_.
- |         |         |
|---------|---------|
| a) 1998 | b) 1999 |
| c) 2001 | d) 2000 |
- 13) The Function of solar collectors to convert \_\_\_\_.
- |                                     |                                 |
|-------------------------------------|---------------------------------|
| a) Solar energy into electricity    | b) Solar energy into radiations |
| c) Solar energy into thermal energy | d) none of these                |
- 14) What is hot molten rock called?
- |                  |            |
|------------------|------------|
| a) Lava          | b) Magma   |
| c) Igneous rocks | d) Volcano |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant and Energy Engineering**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Assume additional suitable data, if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the different types of Load Curves? Explain any one in detail with a neat sketch. **05**  
 b) What is Tariff? Explain any one Tariff Method. **05**  
 c) Explain in short Straight Line Method of Depreciation with figure. **04**
- Q.3** a) Explain the role of NTPC and NPCIL in Power Development. **05**  
 b) Write a short note on the role of Power Grid Corporation in India (PGCIL). **04**  
 c) Explain the requirement of Compressed Air Storage Plants. **05**
- Q.4** a) What are the various factors considered during Selection of Site for Power Station? **05**  
 b) The load supplied by a power station is given below: **05**

| Time (Hr.) | 0 - 6 | 6 - 12 | 12 - 14 | 14 - 18 | 18 - 24 |
|------------|-------|--------|---------|---------|---------|
| Load (MW)  | 35    | 90     | 70      | 100     | 50      |

Draw the load curve & load duration curve. Determine plant capacity factor if plant capacity is 150 MW.

- c) Explain in short the role of the Private Sector in India for Power development. **04**

**Section – II**

- Q.5** a) Write a short note on Pyranometer. **05**  
 b) What is the role of energy audit in energy conservation? **04**  
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- Q.6** a) What are the types of Energy Audit? Explain any one in detail. **05**  
 b) What are the Non-concentrating types Collectors? Explain Liquid Flat Plate Collector with a neat sketch. **05**  
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- Q.7**
- |           |                                                                              |           |
|-----------|------------------------------------------------------------------------------|-----------|
| <b>a)</b> | Give a list and explain in short different energy audit instruments.         | <b>05</b> |
| <b>b)</b> | Give classification of wind mill and state its advantages and disadvantages. | <b>05</b> |
| <b>c)</b> | Define the following terms with neat sketch:                                 | <b>04</b> |
|           | 1) Latitude                                                                  |           |
|           | 2) Hour Angle                                                                |           |
|           | 3) Altitude                                                                  |           |
|           | 4) Solar Azimuth Angle                                                       |           |

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## MECHANICAL ENGINEERING

## Max. Marks: 70

Time: 02:00 PM To 05:00 PM

3) Figures to the right indicate full marks

Marks: 14

14

- 1) A system has a connected load of 100 kW, the peak load of 80 kW. base load of 20 kW and an average load of 40 kW, will have a load factor of \_\_\_\_\_.  
a) 40%                                      b) 50%  
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- 2) What does WECS stands for?  
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- 4) The Function of solar collectors to convert \_\_\_\_\_.  
a) Solar energy into electricity  
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c) Solar energy into thermal energy  
d) none of these
- 5) What is hot molten rock called?  
a) Lava                                          b) Magma  
c) Igneous rocks                          d) Volcano
- 6) Which of the following power plant cannot be used as a base load plant?  
a) Hydroelectric power plant            b) Diesel elected plant  
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- 7) Kinetic energy that results from the oscillation of water is called \_\_\_\_\_.  
a) Wave energy                              b) Tidal energy  
c) Ocean thermal energy                 d) Hydro energy
- 8) Economiser is used to heat \_\_\_\_\_.  
a) Feed water                                b) Air  
c) Flue gases                                 d) All of the above

- 9) Which Meter is used to measure the Beam Radiations?
  - a) Pyrheliometer
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  - c) Load versus cost of power
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- 11) An Inspection survey and analysis of energy flows for energy conservation in a building is called as \_\_\_\_\_.
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  - c) Energy Conservation
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- 12) The solar constant value is \_\_\_\_\_.
  - a)  $1327 \text{ W/m}^2$
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- 13) Which of the following power plant have longest physical life?
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  - c) Hydroelectric power plant
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- 14) In hydroelectric power, what is necessary for the production of power throughout the Year?
  - a) Dams filled with water
  - b) High amount of air
  - c) High intense sunlight
  - d) Nuclear power

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Set **S**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant and Energy Engineering**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Assume additional suitable data, if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the different types of Load Curves? Explain any one in detail with a neat sketch. **05**  
 b) What is Tariff? Explain any one Tariff Method. **05**  
 c) Explain in short Straight Line Method of Depreciation with figure. **04**
- Q.3** a) Explain the role of NTPC and NPCIL in Power Development. **05**  
 b) Write a short note on the role of Power Grid Corporation in India (PGCIL). **04**  
 c) Explain the requirement of Compressed Air Storage Plants. **05**
- Q.4** a) What are the various factors considered during Selection of Site for Power Station? **05**  
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| Time (Hr.) | 0 - 6 | 6 - 12 | 12 - 14 | 14 - 18 | 18 - 24 |
|------------|-------|--------|---------|---------|---------|
| Load (MW)  | 35    | 90     | 70      | 100     | 50      |

Draw the load curve & load duration curve. Determine plant capacity factor if plant capacity is 150 MW.

- c) Explain in short the role of the Private Sector in India for Power development. **04**

**Section – II**

- Q.5** a) Write a short note on Pyranometer. **05**  
 b) What is the role of energy audit in energy conservation? **04**  
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 b) What are the Non-concentrating types Collectors? Explain Liquid Flat Plate Collector with a neat sketch. **05**  
 c) Explain with a neat sketch Closed OTEC Cycle Power Plant. **04**

- Q.7**
- |           |                                                                              |           |
|-----------|------------------------------------------------------------------------------|-----------|
| <b>a)</b> | Give a list and explain in short different energy audit instruments.         | <b>05</b> |
| <b>b)</b> | Give classification of wind mill and state its advantages and disadvantages. | <b>05</b> |
| <b>c)</b> | Define the following terms with neat sketch:                                 | <b>04</b> |
|           | 1) Latitude                                                                  |           |
|           | 2) Hour Angle                                                                |           |
|           | 3) Altitude                                                                  |           |
|           | 4) Solar Azimuth Angle                                                       |           |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Robotics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

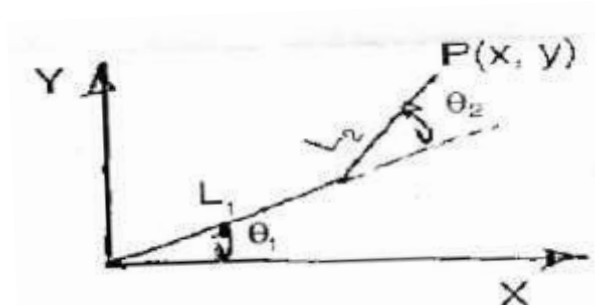
**Instructions:** 1) Solve any two question from the both section.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2**
- a) Explain selection criteria for sensors. **04**
  - b) Explain the five basic robot types according to the work envelope geometries. **06**
  - c) Define the following. **04**
    - 1) Work envelope
    - 2) Work cell
    - 3) Degrees of freedom
    - 4) Servomechanism
- Q.3**
- a) Discuss the construction and working of stepper motors. List its advantages, disadvantages and applications. **05**
  - b) What are the tactile sensors? Explain how they are operated? **04**
  - c) Explain following industrial automation. **05**
    - 1) Fixed automation
    - 2) Programmable automation
    - 3) Flexible automation
- Q.4**
- a) What do you understand by DH conversion Explain in detail? **06**
  - b) Name five different types of robots end effectors. Explain any two. **08**

**Section – II**

- Q.5**
- a) What do you understand by forward & inverse kinematics for 2 dof's? Explain in detail it is desired to determine the values of which the angles  $\theta_1$  &  $\theta_2$  must be set into order to achieve certain point the length of joint  $L_1 = 12$  in the length of  $L_2 = 10$  in. The coordinates  $x = 15.7$  and  $y = 12.6$  using the reverse transformation method determine the angles  $\theta_1$  &  $\theta_2$  **08**



- b) Explain PID control with neat sketch. **06**

- |            |           |                                                                                                                                                                                                                                              |           |
|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.6</b> | <b>a)</b> | Explain the applications of robot in following.<br>1) Medical<br>2) Assembly                                                                                                                                                                 | <b>06</b> |
|            | <b>b)</b> | Explain the applications of robot in following.<br>1) Material handling<br>2) Spray painting/coating                                                                                                                                         | <b>08</b> |
| <b>Q.7</b> | <b>a)</b> | Write a short note on pick and place robot.                                                                                                                                                                                                  | <b>06</b> |
|            | <b>b)</b> | Define "Industrial Robot". List the reasons why and where industrial robots must be deployed in place of humans in the industrial workspace. State possible issues associated with the use of industrial robots in place of human operators. | <b>08</b> |

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| Set Q |
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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Robotics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Binary sensors having \_\_\_\_\_ is the contact device.
 

|            |                  |
|------------|------------------|
| a) Fingers | b) micro switch  |
| c) Wrist   | d) none of these |
- 2) The envelope or space within which robot can manipulate the wrist is known as \_\_\_\_\_.
 

|                  |              |
|------------------|--------------|
| a) repeatability | b) accuracy  |
| c) work volume   | d) stability |
- 3) Degree(s) of freedom of a four - bar mechanism is/are found to be equal to \_\_\_\_\_.
 

|      |                  |
|------|------------------|
| a) 1 | b) 2             |
| c) 3 | d) None of these |
- 4) The non-manufacturing areas of robotics are \_\_\_\_\_.
 

|             |                |
|-------------|----------------|
| a) mining   | b) agriculture |
| c) assembly | d) a & b       |
- 5) Which of the following drives used for control the robots?
 

|               |              |
|---------------|--------------|
| a) Hydraulic  | b) Pneumatic |
| c) Electrical | d) Solenoid  |
- 6) Which of the following are tactile sensors?
 

|                    |                  |
|--------------------|------------------|
| a) Magnetic sensor | b) Piezoelectric |
| c) Encoder         | d) range sensor  |
- 7) Which one of the following statements is TRUE?
 

|                                                  |
|--------------------------------------------------|
| a) Revolute joint is a rotary joint having 1 dof |
| b) Revolute joint is a linear joint having 2 dof |
| c) Revolute joint is a linear joint having 3 dof |
| d) Revolute joint is a linear joint having 4 dof |
- 8) The term "Robotics" was coined by \_\_\_\_\_.
 

|                      |                      |
|----------------------|----------------------|
| a) Karel Capek       | b) Aurther C. Clarke |
| c) Leonardo Da Vinci | d) None of these     |

- 9) When the joint angles and the different configurations of manipulator are derived from the position orientation, the scheme is known as \_\_\_\_\_.  
a) Forward kinematics                      b) inverse kinematics  
c) transformation                              d) none of these
- 10) Which one of the following statements is TRUE?  
a) Dextrous workspace of a manipulator is a subset of its reachable workspace  
b) Reachable workspace of a manipulator is a subset of its dextrous workspace  
c) No relationship exists between dextrous and reachable workspaces  
d) Summation of dextrous and reachable workspaces of a manipulator gives rise to its total workspace
- 11) The term UGV stands for \_\_\_\_\_.  
a) Unnamed Ground Vehicle                      b) Unknown Ground Vehicle  
c) Universal Ground Vehicle                      d) Unmanned Ground Vehicle
- 12) Which type of joints used in robots?  
a) Knuckle joint                                      b) prismatic joint  
c) universal joint                                      d) None of these
- 13) Work envelope generated by Cartesian coordinate robot is \_\_\_\_\_.  
a) Sphere                                              b) Cylinder  
c) rectangular box                                      d) triangle
- 14) Spot welding and Arc welding are the examples of \_\_\_\_\_.  
a) Point-to-point tasks  
b) Continuous path tasks  
c) Point-to-point and continuous path tasks  
d) Continuous path task and point-to-point tasks

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Set **Q**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Robotics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

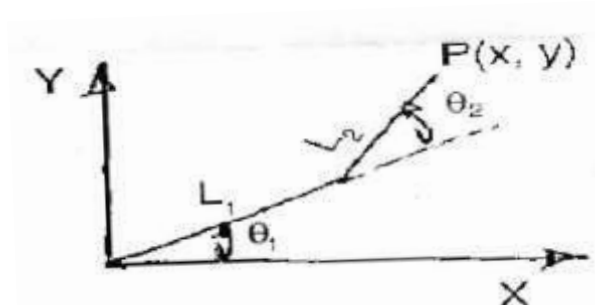
**Instructions:** 1) Solve any two question from the both section.  
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**Section – I**

- Q.2**
- a) Explain selection criteria for sensors. **04**
  - b) Explain the five basic robot types according to the work envelope geometries. **06**
  - c) Define the following. **04**
    - 1) Work envelope
    - 2) Work cell
    - 3) Degrees of freedom
    - 4) Servomechanism
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  - b) What are the tactile sensors? Explain how they are operated? **04**
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- Q.4**
- a) What do you understand by DH conversion Explain in detail? **06**
  - b) Name five different types of robots end effectors. Explain any two. **08**

**Section – II**

- Q.5**
- a) What do you understand by forward & inverse kinematics for 2 dof's? Explain in detail it is desired to determine the values of which the angles  $\theta_1$  &  $\theta_2$  must be set into order to achieve certain point the length of joint  $L_1 = 12$  in the length of  $L_2 = 10$  in. The coordinates  $x = 15.7$  and  $y = 12.6$  using the reverse transformation method determine the angles  $\theta_1$  &  $\theta_2$  **08**



- b) Explain PID control with neat sketch. **06**

- |            |           |                                                                                                                                                                                                                                              |           |
|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.6</b> | <b>a)</b> | Explain the applications of robot in following.                                                                                                                                                                                              | <b>06</b> |
|            |           | 1) Medical                                                                                                                                                                                                                                   |           |
|            |           | 2) Assembly                                                                                                                                                                                                                                  |           |
|            | <b>b)</b> | Explain the applications of robot in following.                                                                                                                                                                                              | <b>08</b> |
|            |           | 1) Material handling                                                                                                                                                                                                                         |           |
|            |           | 2) Spray painting/coating                                                                                                                                                                                                                    |           |
| <b>Q.7</b> | <b>a)</b> | Write a short note on pick and place robot.                                                                                                                                                                                                  | <b>06</b> |
|            | <b>b)</b> | Define "Industrial Robot". List the reasons why and where industrial robots must be deployed in place of humans in the industrial workspace. State possible issues associated with the use of industrial robots in place of human operators. | <b>08</b> |

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- 8) The term UGV stands for \_\_\_\_\_.  
a) Unnamed Ground Vehicle      b) Unknown Ground Vehicle  
c) Universal Ground Vehicle      d) Unmanned Ground Vehicle
- 9) Which type of joints used in robots?  
a) Knuckle joint      b) prismatic joint  
c) universal joint      d) None of these
- 10) Work envelope generated by Cartesian coordinate robot is \_\_\_\_\_.  
a) Sphere      b) Cylinder  
c) rectangular box      d) triangle
- 11) Spot welding and Arc welding are the examples of \_\_\_\_\_.  
a) Point-to-point tasks  
b) Continuous path tasks  
c) Point-to-point and continuous path tasks  
d) Continuous path task and point-to-point tasks
- 12) Binary sensors having \_\_\_\_\_ is the contact device.  
a) Fingers      b) micro switch  
c) Wrist      d) none of these
- 13) The envelope or space within which robot can manipulate the wrist is known as \_\_\_\_\_.  
a) repeatability      b) accuracy  
c) work volume      d) stability
- 14) Degree(s) of freedom of a four - bar mechanism is/are found to be equal to \_\_\_\_\_.  
a) 1      b) 2  
c) 3      d) None of these

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Set **R**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Robotics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

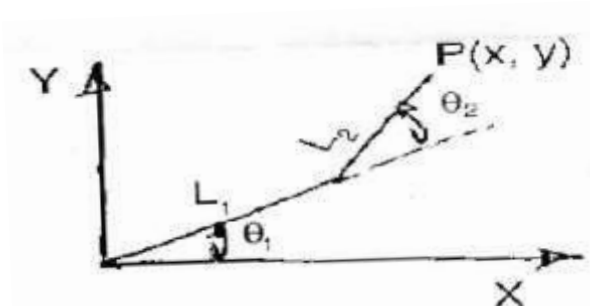
**Instructions:** 1) Solve any two question from the both section.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2**
- a) Explain selection criteria for sensors. **04**
  - b) Explain the five basic robot types according to the work envelope geometries. **06**
  - c) Define the following. **04**
    - 1) Work envelope
    - 2) Work cell
    - 3) Degrees of freedom
    - 4) Servomechanism
- Q.3**
- a) Discuss the construction and working of stepper motors. List its advantages, disadvantages and applications. **05**
  - b) What are the tactile sensors? Explain how they are operated? **04**
  - c) Explain following industrial automation. **05**
    - 1) Fixed automation
    - 2) Programmable automation
    - 3) Flexible automation
- Q.4**
- a) What do you understand by DH conversion Explain in detail? **06**
  - b) Name five different types of robots end effectors. Explain any two. **08**

**Section – II**

- Q.5**
- a) What do you understand by forward & inverse kinematics for 2 dof's? **08**  
 Explain in detail it is desired to determine the values of which the angles  $\theta_1$  &  $\theta_2$  must be set into order to achieve certain point the length of joint  $L_1 = 12$  in the length of  $L_2 = 10$  in. The coordinates  $x = 15.7$  and  $y = 12.6$  using the reverse transformation method determine the angles  $\theta_1$  &  $\theta_2$



- b) Explain PID control with neat sketch. **06**

- |            |           |                                                                                                                                                                                                                                              |           |
|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.6</b> | <b>a)</b> | Explain the applications of robot in following.<br>1) Medical<br>2) Assembly                                                                                                                                                                 | <b>06</b> |
|            | <b>b)</b> | Explain the applications of robot in following.<br>1) Material handling<br>2) Spray painting/coating                                                                                                                                         | <b>08</b> |
| <b>Q.7</b> | <b>a)</b> | Write a short note on pick and place robot.                                                                                                                                                                                                  | <b>06</b> |
|            | <b>b)</b> | Define "Industrial Robot". List the reasons why and where industrial robots must be deployed in place of humans in the industrial workspace. State possible issues associated with the use of industrial robots in place of human operators. | <b>08</b> |

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- 9) Which one of the following statements is TRUE?
  - a) Revolute joint is a rotary joint having 1 dof
  - b) Revolute joint is a linear joint having 2 dof
  - c) Revolute joint is a linear joint having 3 dof
  - d) Revolute joint is a linear joint having 4 dof
- 10) The term "Robotics" was coined by \_\_\_\_\_.
  - a) Karel Capek
  - b) Aurthar C. Clarke
  - c) Leonardo Da Vinci
  - d) None of these
- 11) When the joint angles and the different configurations of manipulator are derived from the position orientation, the scheme is known as \_\_\_\_\_.
  - a) Forward kinematics
  - b) inverse kinematics
  - c) transformation
  - d) none of these
- 12) Which one of the following statements is TRUE?
  - a) Dextrous workspace of a manipulator is a subset of its reachable workspace
  - b) Reachable workspace of a manipulator is a subset of its dextrous workspace
  - c) No relationship exists between dextrous and reachable workspaces
  - d) Summation of dextrous and reachable workspaces of a manipulator gives rise to its total workspace
- 13) The term UGV stands for \_\_\_\_\_.
  - a) Unnamed Ground Vehicle
  - b) Unknown Ground Vehicle
  - c) Universal Ground Vehicle
  - d) Unmanned Ground Vehicle
- 14) Which type of joints used in robots?
  - a) Knuckle joint
  - b) prismatic joint
  - c) universal joint
  - d) None of these

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Set **S**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Industrial Robotics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

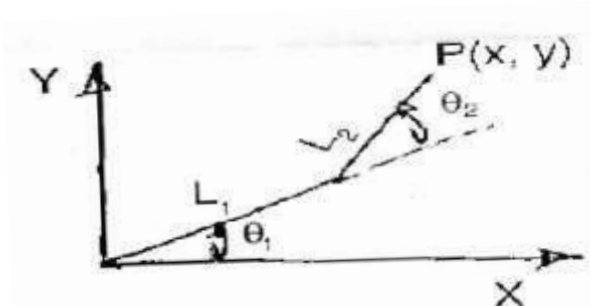
**Instructions:** 1) Solve any two question from the both section.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2**
- a) Explain selection criteria for sensors. **04**
  - b) Explain the five basic robot types according to the work envelope geometries. **06**
  - c) Define the following. **04**
    - 1) Work envelope
    - 2) Work cell
    - 3) Degrees of freedom
    - 4) Servomechanism
- Q.3**
- a) Discuss the construction and working of stepper motors. List its advantages, disadvantages and applications. **05**
  - b) What are the tactile sensors? Explain how they are operated? **04**
  - c) Explain following industrial automation. **05**
    - 1) Fixed automation
    - 2) Programmable automation
    - 3) Flexible automation
- Q.4**
- a) What do you understand by DH conversion Explain in detail? **06**
  - b) Name five different types of robots end effectors. Explain any two. **08**

**Section – II**

- Q.5**
- a) What do you understand by forward & inverse kinematics for 2 dof's? **08**  
 Explain in detail it is desired to determine the values of which the angles  $\theta_1$  &  $\theta_2$  must be set into order to achieve certain point the length of joint  $L_1 = 12$  in the length of  $L_2 = 10$  in. The coordinates  $x = 15.7$  and  $y = 12.6$  using the reverse transformation method determine the angles  $\theta_1$  &  $\theta_2$



- b) Explain PID control with neat sketch. **06**

- |            |           |                                                                                                                                                                                                                                              |           |
|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.6</b> | <b>a)</b> | Explain the applications of robot in following.<br>1) Medical<br>2) Assembly                                                                                                                                                                 | <b>06</b> |
|            | <b>b)</b> | Explain the applications of robot in following.<br>1) Material handling<br>2) Spray painting/coating                                                                                                                                         | <b>08</b> |
| <b>Q.7</b> | <b>a)</b> | Write a short note on pick and place robot.                                                                                                                                                                                                  | <b>06</b> |
|            | <b>b)</b> | Define "Industrial Robot". List the reasons why and where industrial robots must be deployed in place of humans in the industrial workspace. State possible issues associated with the use of industrial robots in place of human operators. | <b>08</b> |

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- 9) From following, the alternative name for Rapid Prototyping is \_\_\_\_\_.  
a) Additive Manufacturing                      b) Layer Manufacturing  
c) Direct CAD Manufacturing                  d) All of the above
- 10) Following is not the type of Geometrical Modeling?  
a) Solid Modeling                                  b) Drafting  
c) Surface Modeling                              d) Wireframe Modeling
- 11) Process of converting STL file model in to layers is called \_\_\_\_\_ in RP.  
a) chopping                                          b) slicing  
c) cutting                                              d) trimming
- 12) Full form of STL is \_\_\_\_\_.  
a) Straight-lithography                          b) Streto-lithography  
c) Stereo-lithography                              d) Straight-lipsography
- 13) In the \_\_\_\_\_ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.  
a) Subtractive process                              b) Additive process  
c) Formative process                                d) All of above
- 14) Which of the following is used as base material in Stereolithography (SLA) process?  
a) Thermoplastics, Metals powders  
b) Thermoplastics, Eutectic metals  
c) Photopolymer  
d) Titanium alloys

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Introduction to 3D Printing**

Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5.  
2) Q. 6 is compulsory, attempt any two out of Q.7 to Q.9.  
3) Figures to the right indicate full marks.  
4) Assume suitable data if required.

**Section – I**

- Q.2** Explain the need of additive manufacturing with respect to industry applications. **10**
- Q.3** Compare Additive Manufacturing Vs conventional Manufacturing. **09**
- Q.4** Enlist the types of Additive manufacturing process and Illustrate Vat Photopolymerization process in detail. **09**
- Q.5** Explain Material Extrusion Process with neat sketch. **09**

**Section – II**

- Q.6** Discuss different 3D CAD modeling features that can be used during the additive manufacturing process. **10**
- Q.7** Describe the classification of Additive manufacturing with respect to Technology in detail. **09**
- Q.8** Enlist different polymers used in Additive manufacturing. Explain in detail applications and characteristics of any 2 polymers used in additive manufacturing process. **09**
- Q.9** Discuss the different applications of 3D printing in the Medical, Automobile Aerospace and Manufacturing field. **09**

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Introduction to 3D Printing**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Choose the correct sequence to generate prototype.
  - a) 3D CAD data - CAD solid model - STL file - RP prototype
  - b) CAD solid model - 3D CAD data - RP prototype - STL file
  - c) STL file - 3D CAD data - CAD solid model - RP prototype
  - d) 3D CAD data - STL file - CAD solid model - RP prototype
- 2) From following, the alternative name for Rapid Prototyping is \_\_\_\_\_.
  - a) Additive Manufacturing
  - b) Layer Manufacturing
  - c) Direct CAD Manufacturing
  - d) All of the above
- 3) Following is not the type of Geometrical Modeling?
  - a) Solid Modeling
  - b) Drafting
  - c) Surface Modeling
  - d) Wireframe Modeling
- 4) Process of converting STL file model in to layers is called \_\_\_\_\_ in RP.
  - a) chopping
  - b) slicing
  - c) cutting
  - d) trimming
- 5) Full form of STL is \_\_\_\_\_.
  - a) Straight-lithography
  - b) Streto-lithography
  - c) Stereo-lithography
  - d) Straight-lipsography
- 6) In the \_\_\_\_\_ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.
  - a) Subtractive process
  - b) Additive process
  - c) Formative process
  - d) All of above
- 7) Which of the following is used as base material in Stereolithography (SLA) process?
  - a) Thermoplastics, Metals powders
  - b) Thermoplastics, Eutectic metals
  - c) Photopolymer
  - d) Titanium alloys

- 8) Which kind of laser is used to cut the sheets in LOM?
- |                |                         |
|----------------|-------------------------|
| a) Ruby Laser  | b) Carbon Dioxide Laser |
| c) He-Ne Laser | d) None of these        |
- 9) STL file format is represented by interaction of \_\_\_\_\_.  
a) lines and hexagons      b) lines and rectangles  
c) lines and triangles      d) lines and circles
- 10) Which of the following is used as base material in Selective laser sintering (SLS)?  
a) Photopolymer      b) Thermoplastics, Metal powders  
c) Titanium alloys      d) Various materials
- 11) Which material gives finest surface finish in RP?  
a) ABS      b) PLA  
c) Nylon      d) INF
- 12) Which material is not used in 3D printing?  
a) Nylon      b) ABS  
c) PLA      d) PVC
- 13) Creation, analysis, modification, and optimization is \_\_\_\_\_.  
a) CAD      b) CAM  
c) CAE      d) None of above
- 14) Geometric modelling corresponds to \_\_\_\_\_.  
a) Synthesis phase of CAD  
b) Analysis phase of CAD  
c) Synthesis and Analysis phase of CAD  
d) None of the above

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| <b>Set</b> | <b>Q</b> |
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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Introduction to 3D Printing**

Day & Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5.  
2) Q. 6 is compulsory, attempt any two out of Q.7 to Q.9.  
3) Figures to the right indicate full marks.  
4) Assume suitable data if required.

**Section – I**

- Q.2** Explain the need of additive manufacturing with respect to industry applications. **10**
- Q.3** Compare Additive Manufacturing Vs conventional Manufacturing. **09**
- Q.4** Enlist the types of Additive manufacturing process and Illustrate Vat Photopolymerization process in detail. **09**
- Q.5** Explain Material Extrusion Process with neat sketch. **09**

**Section – II**

- Q.6** Discuss different 3D CAD modeling features that can be used during the additive manufacturing process. **10**
- Q.7** Describe the classification of Additive manufacturing with respect to Technology in detail. **09**
- Q.8** Enlist different polymers used in Additive manufacturing. Explain in detail applications and characteristics of any 2 polymers used in additive manufacturing process. **09**
- Q.9** Discuss the different applications of 3D printing in the Medical, Automobile Aerospace and Manufacturing field. **09**

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Introduction to 3D Printing**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Process of converting STL file model in to layers is called \_\_\_\_\_ in RP.
  - a) chopping
  - b) slicing
  - c) cutting
  - d) trimming
- 2) Full form of STL is \_\_\_\_\_.
  - a) Straight-lithography
  - b) Streto-lithography
  - c) Stereo-lithography
  - d) Straight-lipsography
- 3) In the \_\_\_\_\_ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.
  - a) Subtractive process
  - b) Additive process
  - c) Formative process
  - d) All of above
- 4) Which of the following is used as base material in Stereolithography (SLA) process?
  - a) Thermoplastics, Metals powders
  - b) Thermoplastics, Eutectic metals
  - c) Photopolymer
  - d) Titanium alloys
- 5) Which kind of laser is used to cut the sheets in LOM?
  - a) Ruby Laser
  - b) Carbon Dioxide Laser
  - c) He-Ne Laser
  - d) None of these
- 6) STL file format is represented by interaction of \_\_\_\_\_.
  - a) lines and hexagons
  - b) lines and rectangles
  - c) lines and triangles
  - d) lines and circles
- 7) Which of the following is used as base material in Selective laser sintering (SLS)?
  - a) Photopolymer
  - b) Thermoplastics, Metal powders
  - c) Titanium alloys
  - d) Various materials



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Introduction to 3D Printing**

Day & Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5.  
2) Q. 6 is compulsory, attempt any two out of Q.7 to Q.9.  
3) Figures to the right indicate full marks.  
4) Assume suitable data if required.

**Section – I**

- Q.2** Explain the need of additive manufacturing with respect to industry applications. **10**
- Q.3** Compare Additive Manufacturing Vs conventional Manufacturing. **09**
- Q.4** Enlist the types of Additive manufacturing process and Illustrate Vat Photopolymerization process in detail. **09**
- Q.5** Explain Material Extrusion Process with neat sketch. **09**

**Section – II**

- Q.6** Discuss different 3D CAD modeling features that can be used during the additive manufacturing process. **10**
- Q.7** Describe the classification of Additive manufacturing with respect to Technology in detail. **09**
- Q.8** Enlist different polymers used in Additive manufacturing. Explain in detail applications and characteristics of any 2 polymers used in additive manufacturing process. **09**
- Q.9** Discuss the different applications of 3D printing in the Medical, Automobile Aerospace and Manufacturing field. **09**



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Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks: 14

14

- Creation, analysis, modification, and optimization is \_\_\_\_\_.
  - CAD
  - CAM
  - CAE
  - None of above
- Geometric modelling corresponds to \_\_\_\_\_.
  - Synthesis phase of CAD
  - Analysis phase of CAD
  - Synthesis and Analysis phase of CAD
  - None of the above
- Choose the correct sequence to generate prototype.
  - 3D CAD data - CAD solid model - STL file - RP prototype
  - CAD solid model - 3D CAD data - RP prototype - STL file
  - STL file - 3D CAD data - CAD solid model - RP prototype
  - 3D CAD data - STL file - CAD solid model - RP prototype
- From following, the alternative name for Rapid Prototyping is \_\_\_\_\_.
  - Additive Manufacturing
  - Layer Manufacturing
  - Direct CAD Manufacturing
  - All of the above
- Following is not the type of Geometrical Modeling?
  - Solid Modeling
  - Drafting
  - Surface Modeling
  - Wireframe Modeling
- Process of converting STL file model in to layers is called \_\_\_\_\_ in RP.
  - chopping
  - slicing
  - cutting
  - trimming
- Full form of STL is \_\_\_\_\_.
  - Straight-lithography
  - Streto-lithography
  - Stereo-lithography
  - Straight-lipsography
- In the \_\_\_\_\_ process, one starts with a single block of solid material larger than the final size of the desired object and material is removed until the desired shape is reached.
  - Subtractive process
  - Additive process
  - Formative process
  - All of above

- 9) Which of the following is used as base material in Stereolithography (SLA) process?
- a) Thermoplastics, Metals powders
  - b) Thermoplastics, Eutectic metals
  - c) Photopolymer
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- 10) Which kind of laser is used to cut the sheets in LOM?
- a) Ruby Laser
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- 11) STL file format is represented by interaction of \_\_\_\_.
- a) lines and hexagons
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  - c) lines and triangles
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- 12) Which of the following is used as base material in Selective laser sintering (SLS)?
- a) Photopolymer
  - b) Thermoplastics, Metal powders
  - c) Titanium alloys
  - d) Various materials
- 13) Which material gives finest surface finish in RP?
- a) ABS
  - b) PLA
  - c) Nylon
  - d) INF
- 14) Which material is not used in 3D printing?
- a) Nylon
  - b) ABS
  - c) PLA
  - d) PVC

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Introduction to 3D Printing**

Day & Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q.2 is compulsory, attempt any two out of Q.3 to Q.5.  
2) Q. 6 is compulsory, attempt any two out of Q.7 to Q.9.  
3) Figures to the right indicate full marks.  
4) Assume suitable data if required.

**Section – I**

- Q.2** Explain the need of additive manufacturing with respect to industry applications. **10**
- Q.3** Compare Additive Manufacturing Vs conventional Manufacturing. **09**
- Q.4** Enlist the types of Additive manufacturing process and Illustrate Vat Photopolymerization process in detail. **09**
- Q.5** Explain Material Extrusion Process with neat sketch. **09**

**Section – II**

- Q.6** Discuss different 3D CAD modeling features that can be used during the additive manufacturing process. **10**
- Q.7** Describe the classification of Additive manufacturing with respect to Technology in detail. **09**
- Q.8** Enlist different polymers used in Additive manufacturing. Explain in detail applications and characteristics of any 2 polymers used in additive manufacturing process. **09**
- Q.9** Discuss the different applications of 3D printing in the Medical, Automobile Aerospace and Manufacturing field. **09**

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following is not a renewable source of energy?
 

|          |          |
|----------|----------|
| a) Wind  | b) Tidal |
| c) Solar | d) Coal  |
- 2) Solar collectors are coated with Black colour for the purpose of \_\_\_\_\_.
 

|                                     |
|-------------------------------------|
| a) For minimum absorbtion of energy |
| b) For maximum absorbtion of energy |
| c) For maximum reflection of energy |
| d) None of above                    |
- 3) What is a solar collector?
 

|                                                      |
|------------------------------------------------------|
| a) A system to collect heat by absorbing sunlight    |
| b) A system to collect rainwater using sunlight      |
| c) A system to collect electricity by using sunlight |
| d) A device to reflect sunlight back                 |
- 4) Solar Power plant use \_\_\_\_\_ type of Collectors.
 

|                   |                      |
|-------------------|----------------------|
| a) Concentrating  | b) Flat plate        |
| c) Evacuated tube | d) None of the above |
- 5) Solar Energy can be directly converted into thermal energy by using \_\_\_\_\_.
 

|                      |                      |
|----------------------|----------------------|
| a) Photovoltaic cell | b) Rechargeable cell |
| c) Solar Collector   | d) Dry cell          |
- 6) Wind turbine converts \_\_\_\_\_ of wind into Mechanical energy.
 

|                    |                   |
|--------------------|-------------------|
| a) Potential scale | b) Kinetic energy |
| c) Chemical energy | d) Thermal energy |
- 7) Why is feathering of wind turbine blades required?
 

|                                                               |
|---------------------------------------------------------------|
| a) To increase drag                                           |
| b) To reduce drag                                             |
| c) To prevent the blades from being destroyed by strong winds |
| d) To extract power from strong winds originating from storms |

- 8) What is the major problem with wind energy?
- a) Generates energy from wind
  - b) It is a renewable source of energy
  - c) Requires large area of land
  - d) Compact and does not require large area of land
- 9) How is the temperature maintained in a bubbling fluidized bed?
- a) Biomass
  - b) Gasification agent
  - c) A constant ratio of biomass and gasification agent
  - d) Manipulating the ratio of biomass and gasification agent
- 10) Which of the following is not an application of wind energy?
- a) Electricity
  - b) Steam engine
  - c) Agriculture
  - d) Energy storage for emergencies
- 11) Which of the following technologies are used to convert biomass into useful energy forms?
- a) Bio-chemical process
  - b) Galvanization
  - c) Doping
  - d) Photoelectric effect
- 12) What is the byproduct of an ocean thermal energy conversion system?
- a) Electricity
  - b) Clean water
  - c) Water vapour
  - d) Cold water
- 13) Biomass is used in the production of \_\_\_\_\_.
- a) fibres
  - b) chemicals
  - c) transportation fuels
  - d) biochemicals
- 14) The aerobic digestion of sewage is utilized in the production of \_\_\_\_\_.
- a) metal articles
  - b) biofuels
  - c) biomass
  - d) synthetic fuels

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Renewable Energy Sources**

Day &amp; Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Attempt any two question from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required.  
 4) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve**

- |    |                                                                                                                 |           |
|----|-----------------------------------------------------------------------------------------------------------------|-----------|
| a) | What is the status of non-conventional energy sources in India, and what are their future prospect?             | <b>04</b> |
| b) | What are the disadvantages of conventional energy sources? Explain the need of non-conventional energy sources? | <b>05</b> |
| c) | What are the main advantages of flat plate solar collector?                                                     | <b>05</b> |

**Q.3 Solve**

- |    |                                                                                   |           |
|----|-----------------------------------------------------------------------------------|-----------|
| a) | How does sun tracking helps in energy collection by a flat plate solar collector? | <b>04</b> |
| b) | What is the present status of nuclear energy and what are their future prospects? | <b>05</b> |
| c) | What are limitations of solar energy?                                             | <b>05</b> |

**Q.4 Write a short note on.**

- |    |                             |           |
|----|-----------------------------|-----------|
| a) | Application of Solar Energy | <b>04</b> |
| b) | Evacuated tube collectors   | <b>05</b> |
| c) | Renewable energy sources    | <b>05</b> |

**Section – II**

**Q.5 Solve**

- |    |                                                                |           |
|----|----------------------------------------------------------------|-----------|
| a) | What factors led to the accelerated development of wind power? | <b>04</b> |
| b) | Explain the mechanism of production of local winds.            | <b>05</b> |
| c) | What is the main advantage and disadvantage of biomass energy? | <b>05</b> |

**Q.6 Solve**

- |    |                                                             |           |
|----|-------------------------------------------------------------|-----------|
| a) | Explain the process of gasification of solid bio fuels?     | <b>05</b> |
| b) | What is the effect of pumping on the output of tidal plant? | <b>05</b> |
| c) | Explain the technology available for OTEC.                  | <b>04</b> |

**Q.7 Write a short note on.**

- |    |                                                   |           |
|----|---------------------------------------------------|-----------|
| a) | Advantages and disadvantages of OTEC system       | <b>04</b> |
| b) | Type of bio fuels                                 | <b>05</b> |
| c) | Advantages and disadvantages of ocean wave energy | <b>05</b> |

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Set **Q**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is the major problem with wind energy?
  - a) Generates energy from wind
  - b) It is a renewable source of energy
  - c) Requires large area of land
  - d) Compact and does not require large area of land
- 2) How is the temperature maintained in a bubbling fluidized bed?
  - a) Biomass
  - b) Gasification agent
  - c) A constant ratio of biomass and gasification agent
  - d) Manipulating the ratio of biomass and gasification agent
- 3) Which of the following is not an application of wind energy?
  - a) Electricity
  - b) Steam engine
  - c) Agriculture
  - d) Energy storage for emergencies
- 4) Which of the following technologies are used to convert biomass into useful energy forms?
 

|                         |                         |
|-------------------------|-------------------------|
| a) Bio-chemical process | b) Galvanization        |
| c) Doping               | d) Photoelectric effect |
- 5) What is the byproduct of an ocean thermal energy conversion system?
 

|                 |                |
|-----------------|----------------|
| a) Electricity  | b) Clean water |
| c) Water vapour | d) Cold water  |
- 6) Biomass is used in the production of \_\_\_\_\_.
 

|                         |                 |
|-------------------------|-----------------|
| a) fibres               | b) chemicals    |
| c) transportation fuels | d) biochemicals |
- 7) The aerobic digestion of sewage is utilized in the production of \_\_\_\_\_.
 

|                   |                    |
|-------------------|--------------------|
| a) metal articles | b) biofuels        |
| c) biomass        | d) synthetic fuels |

- 8) Which of the following is not a renewable source of energy?
- a) Wind
  - b) Tidal
  - c) Solar
  - d) Coal
- 9) Solar collectors are coated with Black colour for the purpose of \_\_\_\_\_.  
a) For minimum absorbtion of energy  
b) For maximum absorbtion of energy  
c) For maximum reflection of energy  
d) None of above
- 10) What is a solar collector?  
a) A system to collect heat by absorbing sunlight  
b) A system to collect rainwater using sunlight  
c) A system to collect electricity by using sunlight  
d) A device to reflect sunlight back
- 11) Solar Power plant use \_\_\_\_\_ type of Collectors.  
a) Concentrating- b) Flat plate
- c) Evacuated tube
- d) None of the above

12) Solar Energy can be directly converted into thermal energy by using \_\_\_\_\_.  
a) Photovoltaic cell- b) Rechargeable cell
- c) Solar Collector
- d) Dry cell

13) Wind turbine converts \_\_\_\_\_ of wind into Mechanical energy.  
a) Potential scale- b) Kinetic energy
- c) Chemical energy
- d) Thermal energy

14) Why is feathering of wind turbine blades required?  
a) To increase drag  
b) To reduce drag  
c) To prevent the blades from being destroyed by strong winds  
d) To extract power from strong winds originating from storms



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Renewable Energy Sources**

Day &amp; Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Attempt any two question from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required.  
 4) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve**

- |    |                                                                                                                 |           |
|----|-----------------------------------------------------------------------------------------------------------------|-----------|
| a) | What is the status of non-conventional energy sources in India, and what are their future prospect?             | <b>04</b> |
| b) | What are the disadvantages of conventional energy sources? Explain the need of non-conventional energy sources? | <b>05</b> |
| c) | What are the main advantages of flat plate solar collector?                                                     | <b>05</b> |

**Q.3 Solve**

- |    |                                                                                   |           |
|----|-----------------------------------------------------------------------------------|-----------|
| a) | How does sun tracking helps in energy collection by a flat plate solar collector? | <b>04</b> |
| b) | What is the present status of nuclear energy and what are their future prospects? | <b>05</b> |
| c) | What are limitations of solar energy?                                             | <b>05</b> |

**Q.4 Write a short note on.**

- |    |                             |           |
|----|-----------------------------|-----------|
| a) | Application of Solar Energy | <b>04</b> |
| b) | Evacuated tube collectors   | <b>05</b> |
| c) | Renewable energy sources    | <b>05</b> |

**Section – II**

**Q.5 Solve**

- |    |                                                                |           |
|----|----------------------------------------------------------------|-----------|
| a) | What factors led to the accelerated development of wind power? | <b>04</b> |
| b) | Explain the mechanism of production of local winds.            | <b>05</b> |
| c) | What is the main advantage and disadvantage of biomass energy? | <b>05</b> |

**Q.6 Solve**

- |    |                                                             |           |
|----|-------------------------------------------------------------|-----------|
| a) | Explain the process of gasification of solid bio fuels?     | <b>05</b> |
| b) | What is the effect of pumping on the output of tidal plant? | <b>05</b> |
| c) | Explain the technology available for OTEC.                  | <b>04</b> |

**Q.7 Write a short note on.**

- |    |                                                   |           |
|----|---------------------------------------------------|-----------|
| a) | Advantages and disadvantages of OTEC system       | <b>04</b> |
| b) | Type of bio fuels                                 | <b>05</b> |
| c) | Advantages and disadvantages of ocean wave energy | <b>05</b> |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following technologies are used to convert biomass into useful energy forms?
 

|                         |                         |
|-------------------------|-------------------------|
| a) Bio-chemical process | b) Galvanization        |
| c) Doping               | d) Photoelectric effect |
- 2) What is the byproduct of an ocean thermal energy conversion system?
 

|                 |                |
|-----------------|----------------|
| a) Electricity  | b) Clean water |
| c) Water vapour | d) Cold water  |
- 3) Biomass is used in the production of \_\_\_\_\_.
 

|                         |                 |
|-------------------------|-----------------|
| a) fibres               | b) chemicals    |
| c) transportation fuels | d) biochemicals |
- 4) The aerobic digestion of sewage is utilized in the production of \_\_\_\_\_.
 

|                   |                    |
|-------------------|--------------------|
| a) metal articles | b) biofuels        |
| c) biomass        | d) synthetic fuels |
- 5) Which of the following is not a renewable source of energy?
 

|          |          |
|----------|----------|
| a) Wind  | b) Tidal |
| c) Solar | d) Coal  |
- 6) Solar collectors are coated with Black colour for the purpose of \_\_\_\_\_.
 

|                                     |
|-------------------------------------|
| a) For minimum absorbtion of energy |
| b) For maximum absorbtion of energy |
| c) For maximum reflection of energy |
| d) None of above                    |
- 7) What is a solar collector?
 

|                                                      |
|------------------------------------------------------|
| a) A system to collect heat by absorbing sunlight    |
| b) A system to collect rainwater using sunlight      |
| c) A system to collect electricity by using sunlight |
| d) A device to reflect sunlight back                 |
- 8) Solar Power plant use \_\_\_\_\_ type of Collectors.
 

|                   |                      |
|-------------------|----------------------|
| a) Concentrating  | b) Flat plate        |
| c) Evacuated tube | d) None of the above |

- 9) Solar Energy can be directly converted into thermal energy by using \_\_\_\_\_.
- |                      |                      |
|----------------------|----------------------|
| a) Photovoltaic cell | b) Rechargeable cell |
| c) Solar Collector   | d) Dry cell          |
- 10) Wind turbine converts \_\_\_\_\_ of wind into Mechanical energy.
- |                    |                   |
|--------------------|-------------------|
| a) Potential scale | b) Kinetic energy |
| c) Chemical energy | d) Thermal energy |
- 11) Why is feathering of wind turbine blades required?
- |                                                               |                   |
|---------------------------------------------------------------|-------------------|
| a) To increase drag                                           | b) To reduce drag |
| c) To prevent the blades from being destroyed by strong winds |                   |
| d) To extract power from strong winds originating from storms |                   |
- 12) What is the major problem with wind energy?
- |                                                    |                                       |
|----------------------------------------------------|---------------------------------------|
| a) Generates energy from wind                      | b) It is a renewable source of energy |
| c) Requires large area of land                     |                                       |
| d) Compact and does not require large area of land |                                       |
- 13) How is the temperature maintained in a bubbling fluidized bed?
- |                                                             |                       |
|-------------------------------------------------------------|-----------------------|
| a) Biomass                                                  | b) Gasification agent |
| c) A constant ratio of biomass and gasification agent       |                       |
| d) Manipulating the ratio of biomass and gasification agent |                       |
- 14) Which of the following is not an application of wind energy?
- |                                   |                 |
|-----------------------------------|-----------------|
| a) Electricity                    | b) Steam engine |
| c) Agriculture                    |                 |
| d) Energy storage for emergencies |                 |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Renewable Energy Sources**

Day &amp; Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Attempt any two question from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required.  
 4) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve**

- |    |                                                                                                                 |           |
|----|-----------------------------------------------------------------------------------------------------------------|-----------|
| a) | What is the status of non-conventional energy sources in India, and what are their future prospect?             | <b>04</b> |
| b) | What are the disadvantages of conventional energy sources? Explain the need of non-conventional energy sources? | <b>05</b> |
| c) | What are the main advantages of flat plate solar collector?                                                     | <b>05</b> |

**Q.3 Solve**

- |    |                                                                                   |           |
|----|-----------------------------------------------------------------------------------|-----------|
| a) | How does sun tracking helps in energy collection by a flat plate solar collector? | <b>04</b> |
| b) | What is the present status of nuclear energy and what are their future prospects? | <b>05</b> |
| c) | What are limitations of solar energy?                                             | <b>05</b> |

**Q.4 Write a short note on.**

- |    |                             |           |
|----|-----------------------------|-----------|
| a) | Application of Solar Energy | <b>04</b> |
| b) | Evacuated tube collectors   | <b>05</b> |
| c) | Renewable energy sources    | <b>05</b> |

**Section – II**

**Q.5 Solve**

- |    |                                                                |           |
|----|----------------------------------------------------------------|-----------|
| a) | What factors led to the accelerated development of wind power? | <b>04</b> |
| b) | Explain the mechanism of production of local winds.            | <b>05</b> |
| c) | What is the main advantage and disadvantage of biomass energy? | <b>05</b> |

**Q.6 Solve**

- |    |                                                             |           |
|----|-------------------------------------------------------------|-----------|
| a) | Explain the process of gasification of solid bio fuels?     | <b>05</b> |
| b) | What is the effect of pumping on the output of tidal plant? | <b>05</b> |
| c) | Explain the technology available for OTEC.                  | <b>04</b> |

**Q.7 Write a short note on.**

- |    |                                                   |           |
|----|---------------------------------------------------|-----------|
| a) | Advantages and disadvantages of OTEC system       | <b>04</b> |
| b) | Type of bio fuels                                 | <b>05</b> |
| c) | Advantages and disadvantages of ocean wave energy | <b>05</b> |

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Set **S**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Renewable Energy Sources**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Wind turbine converts \_\_\_\_\_ of wind into Mechanical energy.
  - a) Potential scale
  - b) Kinetic energy
  - c) Chemical energy
  - d) Thermal energy
- 2) Why is feathering of wind turbine blades required?
  - a) To increase drag
  - b) To reduce drag
  - c) To prevent the blades from being destroyed by strong winds
  - d) To extract power from strong winds originating from storms
- 3) What is the major problem with wind energy?
  - a) Generates energy from wind
  - b) It is a renewable source of energy
  - c) Requires large area of land
  - d) Compact and does not require large area of land
- 4) How is the temperature maintained in a bubbling fluidized bed?
  - a) Biomass
  - b) Gasification agent
  - c) A constant ratio of biomass and gasification agent
  - d) Manipulating the ratio of biomass and gasification agent
- 5) Which of the following is not an application of wind energy?
  - a) Electricity
  - b) Steam engine
  - c) Agriculture
  - d) Energy storage for emergencies
- 6) Which of the following technologies are used to convert biomass into useful energy forms?
  - a) Bio-chemical process
  - b) Galvanization
  - c) Doping
  - d) Photoelectric effect
- 7) What is the byproduct of an ocean thermal energy conversion system?
  - a) Electricity
  - b) Clean water
  - c) Water vapour
  - d) Cold water



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Set **S**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Renewable Energy Sources**

Day &amp; Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Attempt any two question from each section.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required.  
 4) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve**

- |    |                                                                                                                 |           |
|----|-----------------------------------------------------------------------------------------------------------------|-----------|
| a) | What is the status of non-conventional energy sources in India, and what are their future prospect?             | <b>04</b> |
| b) | What are the disadvantages of conventional energy sources? Explain the need of non-conventional energy sources? | <b>05</b> |
| c) | What are the main advantages of flat plate solar collector?                                                     | <b>05</b> |

**Q.3 Solve**

- |    |                                                                                   |           |
|----|-----------------------------------------------------------------------------------|-----------|
| a) | How does sun tracking helps in energy collection by a flat plate solar collector? | <b>04</b> |
| b) | What is the present status of nuclear energy and what are their future prospects? | <b>05</b> |
| c) | What are limitations of solar energy?                                             | <b>05</b> |

**Q.4 Write a short note on.**

- |    |                             |           |
|----|-----------------------------|-----------|
| a) | Application of Solar Energy | <b>04</b> |
| b) | Evacuated tube collectors   | <b>05</b> |
| c) | Renewable energy sources    | <b>05</b> |

**Section – II**

**Q.5 Solve**

- |    |                                                                |           |
|----|----------------------------------------------------------------|-----------|
| a) | What factors led to the accelerated development of wind power? | <b>04</b> |
| b) | Explain the mechanism of production of local winds.            | <b>05</b> |
| c) | What is the main advantage and disadvantage of biomass energy? | <b>05</b> |

**Q.6 Solve**

- |    |                                                             |           |
|----|-------------------------------------------------------------|-----------|
| a) | Explain the process of gasification of solid bio fuels?     | <b>05</b> |
| b) | What is the effect of pumping on the output of tidal plant? | <b>05</b> |
| c) | Explain the technology available for OTEC.                  | <b>04</b> |

**Q.7 Write a short note on.**

- |    |                                                   |           |
|----|---------------------------------------------------|-----------|
| a) | Advantages and disadvantages of OTEC system       | <b>04</b> |
| b) | Type of bio fuels                                 | <b>05</b> |
| c) | Advantages and disadvantages of ocean wave energy | <b>05</b> |

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Max. Marks: 70

Marks: 14

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P

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Introduction to Automobile Engineering**

Day &amp; Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Solve any two question from section I and Section II.

2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question.**

- |    |                                                                                    |           |
|----|------------------------------------------------------------------------------------|-----------|
| a) | Explain Four Wheel drive with neat Sketch. State its advantages and disadvantages. | <b>08</b> |
| b) | Explain with neat sketch working of Single plate Clutch.                           | <b>06</b> |

**Q.3 Answer the following question.**

- |    |                                                                 |           |
|----|-----------------------------------------------------------------|-----------|
| a) | Explain with neat sketch the working of constant mesh Gear Box. | <b>08</b> |
| b) | 1) Explain necessity of transmission                            | <b>03</b> |
|    | 2) Explain double declutching in short                          | <b>03</b> |

**Q.4 Answer the following question.**

- |    |                                                                                      |           |
|----|--------------------------------------------------------------------------------------|-----------|
| a) | Explain the requirements of automobile Brakes. State the types of automobile Brakes. | <b>08</b> |
| b) | Explain working of Propeller shaft and Universal Joint.                              | <b>06</b> |

**Section – II**

**Q.5 Answer the following question.**

- |    |                                                                                         |           |
|----|-----------------------------------------------------------------------------------------|-----------|
| a) | Explain the steering linkages with neat sketch. State the types of steering Geer Boxes, | <b>08</b> |
| b) | <b>Explain in short.</b>                                                                | <b>06</b> |
|    | 1) Caster                                                                               |           |
|    | 2) Camber                                                                               |           |
|    | 3) King pin Inclination                                                                 |           |

**Q.6 Answer the following question.**

- |    |                                                                          |           |
|----|--------------------------------------------------------------------------|-----------|
| a) | State the Types of suspension systems. Explain any one with neat sketch. | <b>08</b> |
| b) | Explain Cross ply, Radial ply, belted bias ply in tyres.                 | <b>06</b> |

**Q.7 Answer the following question.**

- |    |                                                                  |           |
|----|------------------------------------------------------------------|-----------|
| a) | Write a short note on sensors and actuators used in automobiles. | <b>06</b> |
| b) | Explain the construction of battery.                             | <b>04</b> |
| c) | State the advantages of electric vehicles.                       | <b>04</b> |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Introduction to Automobile Engineering**

Day & Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Solve any two question from section I and Section II.

2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question.**

- |    |                                                                                    |           |
|----|------------------------------------------------------------------------------------|-----------|
| a) | Explain Four Wheel drive with neat Sketch. State its advantages and disadvantages. | <b>08</b> |
| b) | Explain with neat sketch working of Single plate Clutch.                           | <b>06</b> |

**Q.3 Answer the following question.**

- |    |                                                                 |           |
|----|-----------------------------------------------------------------|-----------|
| a) | Explain with neat sketch the working of constant mesh Gear Box. | <b>08</b> |
| b) | 1) Explain necessity of transmission                            | <b>03</b> |
|    | 2) Explain double declutching in short                          | <b>03</b> |

**Q.4 Answer the following question.**

- |    |                                                                                      |           |
|----|--------------------------------------------------------------------------------------|-----------|
| a) | Explain the requirements of automobile Brakes. State the types of automobile Brakes. | <b>08</b> |
| b) | Explain working of Propeller shaft and Universal Joint.                              | <b>06</b> |

**Section – II**

**Q.5 Answer the following question.**

- |    |                                                                                         |           |
|----|-----------------------------------------------------------------------------------------|-----------|
| a) | Explain the steering linkages with neat sketch. State the types of steering Geer Boxes, | <b>08</b> |
| b) | <b>Explain in short.</b>                                                                | <b>06</b> |
|    | 1) Caster                                                                               |           |
|    | 2) Camber                                                                               |           |
|    | 3) King pin Inclination                                                                 |           |

**Q.6 Answer the following question.**

- |    |                                                                          |           |
|----|--------------------------------------------------------------------------|-----------|
| a) | State the Types of suspension systems. Explain any one with neat sketch. | <b>08</b> |
| b) | Explain Cross ply, Radial ply, belted bias ply in tyres.                 | <b>06</b> |

**Q.7 Answer the following question.**

- |    |                                                                  |           |
|----|------------------------------------------------------------------|-----------|
| a) | Write a short note on sensors and actuators used in automobiles. | <b>06</b> |
| b) | Explain the construction of battery.                             | <b>04</b> |
| c) | State the advantages of electric vehicles.                       | <b>04</b> |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Introduction to Automobile Engineering**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The coil spring in wishbone suspension is placed between the \_\_\_\_\_.  
 a) two wishbones  
 b) upper wishbone and the cross-member  
 c) lower wishbone and the cross-member  
 d) shock absorber and the cross-member
- 2) The turning circle for a car is approximately \_\_\_\_\_.  
 a) 1 metre  
 b) 2 metres  
 c) 10 metres  
 d) 30 metres
- 3) The brake bleeding process removes from system \_\_\_\_\_.  
 a) air  
 b) vacuum  
 c) excess fluid  
 d) excess pressure
- 4) The brake efficiency of a new vehicle is about \_\_\_\_\_.  
 a) 30 per cent  
 b) 50 per cent  
 c) 80 per cent  
 d) 100 per cent
- 5) The cooling system of automobile engine is most simple when the engine is \_\_\_\_\_.  
 a) front  
 b) centre  
 c) rear on the left  
 d) rear on the right
- 6) In case of a four-wheel driven vehicle \_\_\_\_\_.  
 a) clutch operating linkage is simplified  
 b) cooling system is simplified  
 c) the road adhesion is increased  
 d) the road adhesion is decreased
- 7) The frame may get distorted to a parallelogram shape due to \_\_\_\_\_.  
 a) weight of vehicle  
 b) weight of passengers  
 c) cornering force  
 d) wheel impact with road obstacle
- 8) The most effective section against bending is \_\_\_\_\_.  
 a) rectangular bar  
 b) round bar  
 c) round hollow tube  
 d) square hollow section



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Introduction to Automobile Engineering**

Day & Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Solve any two question from section I and Section II.

2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question.**

- |    |                                                                                    |           |
|----|------------------------------------------------------------------------------------|-----------|
| a) | Explain Four Wheel drive with neat Sketch. State its advantages and disadvantages. | <b>08</b> |
| b) | Explain with neat sketch working of Single plate Clutch.                           | <b>06</b> |

**Q.3 Answer the following question.**

- |    |                                                                 |           |
|----|-----------------------------------------------------------------|-----------|
| a) | Explain with neat sketch the working of constant mesh Gear Box. | <b>08</b> |
| b) | 1) Explain necessity of transmission                            | <b>03</b> |
|    | 2) Explain double declutching in short                          | <b>03</b> |

**Q.4 Answer the following question.**

- |    |                                                                                      |           |
|----|--------------------------------------------------------------------------------------|-----------|
| a) | Explain the requirements of automobile Brakes. State the types of automobile Brakes. | <b>08</b> |
| b) | Explain working of Propeller shaft and Universal Joint.                              | <b>06</b> |

**Section – II**

**Q.5 Answer the following question.**

- |    |                                                                                         |           |
|----|-----------------------------------------------------------------------------------------|-----------|
| a) | Explain the steering linkages with neat sketch. State the types of steering Geer Boxes, | <b>08</b> |
| b) | <b>Explain in short.</b>                                                                | <b>06</b> |
|    | 1) Caster                                                                               |           |
|    | 2) Camber                                                                               |           |
|    | 3) King pin Inclination                                                                 |           |

**Q.6 Answer the following question.**

- |    |                                                                          |           |
|----|--------------------------------------------------------------------------|-----------|
| a) | State the Types of suspension systems. Explain any one with neat sketch. | <b>08</b> |
| b) | Explain Cross ply, Radial ply, belted bias ply in tyres.                 | <b>06</b> |

**Q.7 Answer the following question.**

- |    |                                                                  |           |
|----|------------------------------------------------------------------|-----------|
| a) | Write a short note on sensors and actuators used in automobiles. | <b>06</b> |
| b) | Explain the construction of battery.                             | <b>04</b> |
| c) | State the advantages of electric vehicles.                       | <b>04</b> |



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**

**MECHANICAL ENGINEERING**

**Introduction to Automobile Engineering**

Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The purpose of transmission in an automobile is \_\_\_\_\_.  
 a) to vary the speed of automobile  
 b) to vary the torque at the road wheels  
 c) to vary the power of automobile  
 d) none of the above
- 2) If the intake air temperature of I.C. engine increases its efficiency will \_\_\_\_\_.  
 a) increase  
 b) decrease  
 c) remain same  
 d) none of the mentioned
- 3) The function of a universal joint is to allow the propeller shaft to \_\_\_\_\_.  
 a) change length  
 b) bend sideways  
 c) transfer torque at a angle  
 d) change inclination
- 4) The vehicle ride will be comfortable if \_\_\_\_\_.  
 a) unsprung weight is kept minimum  
 b) sprung weight is kept minimum  
 c) vehicle weight is kept minimum  
 d) all of the above
- 5) Another name for a torsion bar is \_\_\_\_\_.  
 a) stabilizer bar  
 b) strut rod  
 c) panhard rod  
 d) radius rod
- 6) The coil spring in wishbone suspension is placed between the \_\_\_\_\_.  
 a) two wishbones  
 b) upper wishbone and the cross-member  
 c) lower wishbone and the cross-member  
 d) shock absorber and the cross-member
- 7) The turning circle for a car is approximately \_\_\_\_\_.  
 a) 1 metre  
 b) 2 metres  
 c) 10 metres  
 d) 30 metres
- 8) The brake bleeding process removes from system \_\_\_\_\_.  
 a) air  
 b) vacuum  
 c) excess fluid  
 d) excess pressure



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S

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**

**Introduction to Automobile Engineering**

Day &amp; Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Solve any two question from section I and Section II.

2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question.**

- |    |                                                                                    |           |
|----|------------------------------------------------------------------------------------|-----------|
| a) | Explain Four Wheel drive with neat Sketch. State its advantages and disadvantages. | <b>08</b> |
| b) | Explain with neat sketch working of Single plate Clutch.                           | <b>06</b> |

**Q.3 Answer the following question.**

- |    |                                                                 |           |
|----|-----------------------------------------------------------------|-----------|
| a) | Explain with neat sketch the working of constant mesh Gear Box. | <b>08</b> |
| b) | 1) Explain necessity of transmission                            | <b>03</b> |
|    | 2) Explain double declutching in short                          | <b>03</b> |

**Q.4 Answer the following question.**

- |    |                                                                                      |           |
|----|--------------------------------------------------------------------------------------|-----------|
| a) | Explain the requirements of automobile Brakes. State the types of automobile Brakes. | <b>08</b> |
| b) | Explain working of Propeller shaft and Universal Joint.                              | <b>06</b> |

**Section – II**

**Q.5 Answer the following question.**

- |    |                                                                                         |           |
|----|-----------------------------------------------------------------------------------------|-----------|
| a) | Explain the steering linkages with neat sketch. State the types of steering Geer Boxes, | <b>08</b> |
| b) | <b>Explain in short.</b>                                                                | <b>06</b> |
|    | 1) Caster                                                                               |           |
|    | 2) Camber                                                                               |           |
|    | 3) King pin Inclination                                                                 |           |

**Q.6 Answer the following question.**

- |    |                                                                          |           |
|----|--------------------------------------------------------------------------|-----------|
| a) | State the Types of suspension systems. Explain any one with neat sketch. | <b>08</b> |
| b) | Explain Cross ply, Radial ply, belted bias ply in tyres.                 | <b>06</b> |

**Q.7 Answer the following question.**

- |    |                                                                  |           |
|----|------------------------------------------------------------------|-----------|
| a) | Write a short note on sensors and actuators used in automobiles. | <b>06</b> |
| b) | Explain the construction of battery.                             | <b>04</b> |
| c) | State the advantages of electric vehicles.                       | <b>04</b> |

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**S.Y (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The solution of partial differential equation  $\sqrt{p} + \sqrt{q} = 2$  is \_\_\_\_\_.
  - a)  $z = ax + (1 - \sqrt{b})y + c$
  - b)  $z = a^2x + b^2y + c$
  - c)  $z = ax + (2 - \sqrt{a})^2y + c$
  - d)  $z = a(x + y) + c$
- 2) The solution of partial differential equation  $xp - yq = z$  is \_\_\_\_\_.
  - a)  $\phi(xy, yz) = 0$
  - b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$
  - c)  $\phi(\log x, \log y) = 0$
  - d)  $\phi(x + y, y + z) = 0$
- 3) In solving algebraic and Transcendental equations, which of the following method is called method of tangent?
  - a) Trapezoidal rule
  - b) Newton's Raphson method
  - c) Regula Falsie method
  - d) Weddle's rule
- 4) A positive real root of the equation  $xe^x - 2 = 0$  is lies between \_\_\_\_\_.
  - a) 2 and 3
  - b) 1 and 2
  - c) 3 and 4
  - d) 0 and 1
- 5) In the cosine series of  $f(x) = \pi x - x^2$  for  $0 < x < \pi$ , the constant term is \_\_\_\_\_.
  - a)  $\frac{\pi^2}{4}$
  - b)  $\frac{\pi^2}{16}$
  - c)  $\frac{\pi^2}{6}$
  - d)  $\frac{\pi^2}{2}$
- 6) The coefficient of  $\cos(nx)$  in the Fourier series of  $f(x) = x^3$  in  $(-\pi, \pi)$  is \_\_\_\_\_.
  - a) 0
  - b)  $\frac{1}{n}$
  - c)  $\frac{4(-1)^n}{n^2}$
  - d)  $\frac{-2(-1)^n}{n}$

- 7) Gaussian Quadrature formula is used \_\_\_\_\_.  
 a) To solve partial differential equation  
 b) To solve ordinary differential equation  
 c) To find the roots of transcendental equation  
 d) To evaluate the definite integration.
- 8) For the data  $\begin{matrix} x: & 0 & 0.2 & 0.4 \\ y: & 2 & 4 & 5 \end{matrix}$   
 By Trapezoidal rule the value of integration  $\int_0^{0.4} \frac{1}{y} dx$  is \_\_\_\_\_.  
 a) 1.02  
 b) 0.12  
 c) 0.3010  
 d) 1.0012
- 9) To apply Simpson's 3/8<sup>th</sup> rule, the number of sub interval must be \_\_\_\_\_.  
 a) even  
 b) odd  
 c) multiple of 3  
 d) multiple of 4
- 10) If the Poisson distribution is such that  $P(x = 1) = P(x = 2)$  then the mean  $m$  is \_\_\_\_\_.  
 a) 1  
 b) 3  
 c) 2  
 d) 4
- 11) The area under the standard normal curve from  $z = -\infty$  to  $z = 0$  is \_\_\_\_\_.  
 a) 1  
 b) 0  
 c) 1.5  
 d) 0.5
- 12) The value of coefficient of correlation  $r$  lies between \_\_\_\_\_.  
 a) -3 and 3  
 b) -1 and 1  
 c) 1 and 2  
 d) 2 and 3
- 13) If the probability of defective bulbs is 0.02 then the mean of the distribution of defective bulb in a lot of 1000 bulbs is \_\_\_\_\_.  
 a) 160  
 b) 20  
 c) 200  
 d) 120
- 14) If the coefficient of regressions are  $b_{xy} = \frac{5}{6}$  &  $b_{yx} = \frac{8}{15}$  then the coefficient of correlation 'r' is \_\_\_\_\_.  
 a) 0.67  
 b) 1.5  
 c) 0.5  
 d) 0.4

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**S.Y (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day &amp; Date: Monday, 06-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions: 1) All questions are compulsory.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Answer any three questions.**

- a) Solve:  $y^2 zp + x^2 zq = xy^2$  03  
 b) Solve:  $p^3 + q^3 = 27z$  03  
 c) Solve:  $py = 2xy + \log q$  03  
 d) Solve:  $3x \frac{\partial z}{\partial x} - 5y \frac{\partial z}{\partial y} = 0$  by the method of separation of variables. 03

- Q.3 a)** Obtain a Fourier series of  $f(x) = x + x^2$  in the range  $-\pi < x < \pi$  06

**OR**

- a) Expand  $f(x) = e^{ax}$  as a Fourier series in interval  $(0, 2\pi)$  06  
 b) Obtain half range cosine series of  $f(x) = x$  in  $0 < x < 2$  04

**Q.4 Answer any three questions.**

- a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Simpson's 1/3<sup>rd</sup> rule. (Take  $h = 1$ ) 03  
 b) Evaluate  $\int_2^3 \frac{1}{x+1} dx$  using Gaussian three points formula. 03  
 c) Curve is drawn to pass through the points given by the following table. 03  

|    |   |     |     |     |   |     |     |
|----|---|-----|-----|-----|---|-----|-----|
| x: | 1 | 1.5 | 2   | 2.5 | 3 | 3.5 | 4   |
| y: | 2 | 2.4 | 2.7 | 2.8 | 3 | 2.6 | 2.1 |

Using Simpson's 3/8<sup>th</sup> rule, estimate the area bounded between the curve, the  $x$  – axis and the lines  $x = 1$  and  $x = 4$

 d) Evaluate  $\int_0^1 \int_0^1 \frac{1}{1+x+y} dx dy$  using Trapezoidal rule Taking  $h = 0.5, k = 0.5$  03

**Section – II**

**Q.5 Answer any three questions.**

- a) Find a positive real root of the equation  $x - e^{-x} = 0$  correct to four places of decimal using Newton's Raphson method 03  
 b) Find a positive real root of the equation  $x^3 - 3x - 7 = 0$  is one step of Muller's method. Taking three initial approximation 2, 2.5 and 3 03  
 c) Find the value of  $k$ , if the following function is probability density function. 03  

$$f(x) = \frac{k}{1+x^2}, \quad -\infty < x < \infty$$

- d) From the following results obtain the two regression equations. 03
- |                    | $y$ (yield in Kg) | $x$ (rain fall in cms) |
|--------------------|-------------------|------------------------|
| Mean $\rightarrow$ | 508.4             | 26.7                   |
| S.D $\rightarrow$  | 36.8              | 4.6                    |
- and coefficient of correlation is  $r = 0.52$

**Q.6 Attempt any three from the following.**

- a) Find a positive real root of the equation  $2x - \log_e x - 6 = 0$  correct to three decimal places by False position method 03
- b) The probability that a student in an evening college will graduate is 0.4. Determine the probability that out of 5 students (i) none (ii) one will graduate. 03
- c) If 3% of bulbs manufactured by a company are defective, assuming Poisson distribution find the probability that in a pack of 100 bulbs (i) zero bulbs (ii) two bulbs are defective. 03
- d) Using Newton's Raphson iterative formula, find the approximate value of  $\sqrt{12}$  correct to three decimal places. 03

**Q.7 Attempt any two from the following.**

- a) Obtain the Karl Pearson's coefficient of correlation between export of raw material ( $x$ ) and import of finished goods ( $y$ ) from the data. 05
- |       |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|
| $x$ : | 42 | 44 | 58 | 55 | 89 | 98 | 66 |
| $y$ : | 56 | 59 | 53 | 58 | 65 | 78 | 58 |
- b) Using Newton's Raphson method, solve the system of non-linear equations  $x^2 + y - 11 = 0$ ,  $y^2 + x - 7 = 0$  starting with the initial values  $x_0 = 3.5$ ,  $y_0 = -1.5$  (Perform two iterations). 05
- c) If the mean life time and standard deviation of battery cells are 12 hrs. and 3 hrs. What percentage of batteries will have life 05
- (i) between 10 and 14 hrs.
- (ii) more than 15 hrs.
- (iii) less than 6 hrs.
- Assume the distribution to be normal.
- (Given: For S.N.V  $z$ , area from  $z = 0$  to  $z = 0.67$  is 0.2486, from  $z = 0$  to  $z = 1$  is 0.3413 and from  $z = 0$  to  $z = 2$  is 0.4772)

**Seat  
No.**



- 8) The solution of partial differential equation  $\sqrt{p} + \sqrt{q} = 2$  is \_\_\_\_\_.  
 a)  $z = ax + (1 - \sqrt{b})y + c$   
 b)  $z = a^2x + b^2y + c$   
 c)  $z = ax + (2 - \sqrt{a})^2y + c$   
 d)  $z = a(x + y) + c$
- 9) The solution of partial differential equation  $xp - yq = z$  is \_\_\_\_\_.  
 a)  $\phi(xy, yz) = 0$   
 b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$   
 c)  $\phi(\log x, \log y) = 0$   
 d)  $\phi(x + y, y + z) = 0$
- 10) In solving algebraic and Transcendental equations, which of the following method is called method of tangent?  
 a) Trapezoidal rule  
 b) Newton's Raphson method  
 c) Regula Falsie method  
 d) Weddle's rule
- 11) A positive real root of the equation  $xe^x - 2 = 0$  is lies between \_\_\_\_\_.  
 a) 2 and 3  
 b) 1 and 2  
 c) 3 and 4  
 d) 0 and 1
- 12) In the cosine series of  $f(x) = \pi x - x^2$  for  $0 < x < \pi$ , the constant term is \_\_\_\_\_.  
 a)  $\frac{\pi^2}{4}$   
 b)  $\frac{\pi^2}{16}$   
 c)  $\frac{\pi^2}{6}$   
 d)  $\frac{\pi^2}{2}$
- 13) The coefficient of  $\cos(nx)$  in the Fourier series of  $f(x) = x^3$  in  $(-\pi, \pi)$  is \_\_\_\_\_.  
 a) 0  
 b)  $\frac{1}{n}$   
 c)  $\frac{4(-1)^n}{n^2}$   
 d)  $\frac{-2(-1)^n}{n}$
- 14) Gaussian Quadrature formula is used \_\_\_\_\_.  
 a) To solve partial differential equation  
 b) To solve ordinary differential equation  
 c) To find the roots of transcendental equation  
 d) To evaluate the definite integration.

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Set **Q**

**S.Y (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions: 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I****Q.2 Answer any three questions.**

- a) Solve:  $y^2 zp + x^2 zq = xy^2$  **03**  
 b) Solve:  $p^3 + q^3 = 27z$  **03**  
 c) Solve:  $py = 2xy + \log q$  **03**  
 d) Solve:  $3x \frac{\partial z}{\partial x} - 5y \frac{\partial z}{\partial y} = 0$  by the method of separation of variables. **03**

**Q.3 a) Obtain a Fourier series of  $f(x) = x + x^2$  in the range  $-\pi < x < \pi$  **06******OR**

- a) Expand  $f(x) = e^{ax}$  as a Fourier series in interval  $(0, 2\pi)$  **06**  
 b) Obtain half range cosine series of  $f(x) = x$  in  $0 < x < 2$  **04**

**Q.4 Answer any three questions.**

- a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Simpson's 1/3<sup>rd</sup> rule. (Take  $h = 1$ ) **03**  
 b) Evaluate  $\int_2^3 \frac{1}{x+1} dx$  using Gaussian three points formula. **03**  
 c) Curve is drawn to pass through the points given by the following table. **03**  

|       |   |     |     |     |   |     |     |
|-------|---|-----|-----|-----|---|-----|-----|
| $x$ : | 1 | 1.5 | 2   | 2.5 | 3 | 3.5 | 4   |
| $y$ : | 2 | 2.4 | 2.7 | 2.8 | 3 | 2.6 | 2.1 |

Using Simpson's 3/8<sup>th</sup> rule, estimate the area bounded between the curve, the  $x$  – axis and the lines  $x = 1$  and  $x = 4$

d) Evaluate  $\int_0^1 \int_0^1 \frac{1}{1+x+y} dx dy$  using Trapezoidal rule Taking  $h = 0.5, k = 0.5$  **03**

**Section – II****Q.5 Answer any three questions.**

- a) Find a positive real root of the equation  $x - e^{-x} = 0$  correct to four places of decimal using Newton's Raphson method **03**  
 b) Find a positive real root of the equation  $x^3 - 3x - 7 = 0$  is one step of Muller's method. Taking three initial approximation 2, 2.5 and 3 **03**  
 c) Find the value of  $k$ , if the following function is probability density function. **03**  

$$f(x) = \frac{k}{1+x^2}, \quad -\infty < x < \infty$$

- d) From the following results obtain the two regression equations. 03
- |                    | $y$ (yield in Kg) | $x$ (rain fall in cms) |
|--------------------|-------------------|------------------------|
| Mean $\rightarrow$ | 508.4             | 26.7                   |
| S.D $\rightarrow$  | 36.8              | 4.6                    |
- and coefficient of correlation is  $r = 0.52$

**Q.6 Attempt any three from the following.**

- a) Find a positive real root of the equation  $2x - \log_e x - 6 = 0$  correct to three decimal places by False position method 03
- b) The probability that a student in an evening college will graduate is 0.4. Determine the probability that out of 5 students (i) none (ii) one will graduate. 03
- c) If 3% of bulbs manufactured by a company are defective, assuming Poisson distribution find the probability that in a pack of 100 bulbs (i) zero bulbs (ii) two bulbs are defective. 03
- d) Using Newton's Raphson iterative formula, find the approximate value of  $\sqrt{12}$  correct to three decimal places. 03

**Q.7 Attempt any two from the following.**

- a) Obtain the Karl Pearson's coefficient of correlation between export of raw material ( $x$ ) and import of finished goods ( $y$ ) from the data. 05
- |       |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|
| $x$ : | 42 | 44 | 58 | 55 | 89 | 98 | 66 |
| $y$ : | 56 | 59 | 53 | 58 | 65 | 78 | 58 |
- b) Using Newton's Raphson method, solve the system of non-linear equations  $x^2 + y - 11 = 0$ ,  $y^2 + x - 7 = 0$  starting with the initial values  $x_0 = 3.5$ ,  $y_0 = -1.5$  (Perform two iterations). 05
- c) If the mean life time and standard deviation of battery cells are 12 hrs. and 3 hrs. What percentage of batteries will have life 05
- (i) between 10 and 14 hrs.
- (ii) more than 15 hrs.
- (iii) less than 6 hrs.
- Assume the distribution to be normal.
- (Given: For S.N.V  $z$ , area from  $z = 0$  to  $z = 0.67$  is 0.2486, from  $z = 0$  to  $z = 1$  is 0.3413 and from  $z = 0$  to  $z = 2$  is 0.4772)

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| Set | R |
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## Max. Marks: 70

Marks: 14

14

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Set **R**

**S.Y (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions: 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I****Q.2 Answer any three questions.**

- a) Solve:  $y^2 zp + x^2 zq = xy^2$  **03**  
 b) Solve:  $p^3 + q^3 = 27z$  **03**  
 c) Solve:  $py = 2xy + \log q$  **03**  
 d) Solve:  $3x \frac{\partial z}{\partial x} - 5y \frac{\partial z}{\partial y} = 0$  by the method of separation of variables. **03**

**Q.3 a) Obtain a Fourier series of  $f(x) = x + x^2$  in the range  $-\pi < x < \pi$  **06******OR**

- a) Expand  $f(x) = e^{ax}$  as a Fourier series in interval  $(0, 2\pi)$  **06**  
 b) Obtain half range cosine series of  $f(x) = x$  in  $0 < x < 2$  **04**

**Q.4 Answer any three questions.**

- a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Simpson's 1/3<sup>rd</sup> rule. (Take  $h = 1$ ) **03**  
 b) Evaluate  $\int_2^3 \frac{1}{x+1} dx$  using Gaussian three points formula. **03**  
 c) Curve is drawn to pass through the points given by the following table. **03**  

|       |   |     |     |     |   |     |     |
|-------|---|-----|-----|-----|---|-----|-----|
| $x$ : | 1 | 1.5 | 2   | 2.5 | 3 | 3.5 | 4   |
| $y$ : | 2 | 2.4 | 2.7 | 2.8 | 3 | 2.6 | 2.1 |

Using Simpson's 3/8<sup>th</sup> rule, estimate the area bounded between the curve, the  $x$  – axis and the lines  $x = 1$  and  $x = 4$

d) Evaluate  $\int_0^1 \int_0^1 \frac{1}{1+x+y} dx dy$  using Trapezoidal rule Taking  $h = 0.5, k = 0.5$  **03**

**Section – II****Q.5 Answer any three questions.**

- a) Find a positive real root of the equation  $x - e^{-x} = 0$  correct to four places of decimal using Newton's Raphson method **03**  
 b) Find a positive real root of the equation  $x^3 - 3x - 7 = 0$  is one step of Muller's method. Taking three initial approximation 2, 2.5 and 3 **03**  
 c) Find the value of  $k$ , if the following function is probability density function. **03**  

$$f(x) = \frac{k}{1+x^2}, \quad -\infty < x < \infty$$

- d) From the following results obtain the two regression equations. 03
- |                    | $y$ (yield in Kg) | $x$ (rain fall in cms) |
|--------------------|-------------------|------------------------|
| Mean $\rightarrow$ | 508.4             | 26.7                   |
| S.D $\rightarrow$  | 36.8              | 4.6                    |
- and coefficient of correlation is  $r = 0.52$

**Q.6 Attempt any three from the following.**

- a) Find a positive real root of the equation  $2x - \log_e x - 6 = 0$  correct to three decimal places by False position method 03
- b) The probability that a student in an evening college will graduate is 0.4. Determine the probability that out of 5 students (i) none (ii) one will graduate. 03
- c) If 3% of bulbs manufactured by a company are defective, assuming Poisson distribution find the probability that in a pack of 100 bulbs (i) zero bulbs (ii) two bulbs are defective. 03
- d) Using Newton's Raphson iterative formula, find the approximate value of  $\sqrt{12}$  correct to three decimal places. 03

**Q.7 Attempt any two from the following.**

- a) Obtain the Karl Pearson's coefficient of correlation between export of raw material ( $x$ ) and import of finished goods ( $y$ ) from the data. 05
- |       |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|
| $x$ : | 42 | 44 | 58 | 55 | 89 | 98 | 66 |
| $y$ : | 56 | 59 | 53 | 58 | 65 | 78 | 58 |
- b) Using Newton's Raphson method, solve the system of non-linear equations  $x^2 + y - 11 = 0$ ,  $y^2 + x - 7 = 0$  starting with the initial values  $x_0 = 3.5$ ,  $y_0 = -1.5$  (Perform two iterations). 05
- c) If the mean life time and standard deviation of battery cells are 12 hrs. and 3 hrs. What percentage of batteries will have life 05
- (i) between 10 and 14 hrs.
- (ii) more than 15 hrs.
- (iii) less than 6 hrs.
- Assume the distribution to be normal.
- (Given: For S.N.V  $z$ , area from  $z = 0$  to  $z = 0.67$  is 0.2486, from  $z = 0$  to  $z = 1$  is 0.3413 and from  $z = 0$  to  $z = 2$  is 0.4772)

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Max. Marks: 70

Marks: 14

14

- Page 13 of 16



- 8) If the probability of defective bulbs is 0.02 then the mean of the distribution of defective bulb in a lot of 1000 bulbs is \_\_\_\_\_.  
a) 160  
b) 20  
c) 200  
d) 120
- 9) If the coefficient of regressions are  $b_{xy} = \frac{5}{6}$  &  $b_{yx} = \frac{8}{15}$  then the coefficient of correlation 'r' is \_\_\_\_\_.  
a) 0.67  
b) 1.5  
c) 0.5  
d) 0.4
- 10) The solution of partial differential equation  $\sqrt{p} + \sqrt{q} = 2$  is \_\_\_\_\_.  
a)  $z = ax + (1 - \sqrt{b})y + c$   
b)  $z = a^2x + b^2y + c$   
c)  $z = ax + (2 - \sqrt{a})^2y + c$   
d)  $z = a(x + y) + c$
- 11) The solution of partial differential equation  $xp - yq = z$  is \_\_\_\_\_.  
a)  $\phi(xy, yz) = 0$   
b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$   
c)  $\phi(\log x, \log y) = 0$   
d)  $\phi(x + y, y + z) = 0$
- 12) In solving algebraic and Transcendental equations, which of the following method is called method of tangent?  
a) Trapezoidal rule  
b) Newton's Raphson method  
c) Regula Falsie method  
d) Weddle's rule
- 13) A positive real root of the equation  $xe^x - 2 = 0$  is lies between \_\_\_\_\_.  
a) 2 and 3  
b) 1 and 2  
c) 3 and 4  
d) 0 and 1
- 14) In the cosine series of  $f(x) = \pi x - x^2$  for  $0 < x < \pi$ , the constant term is \_\_\_\_\_.  
a)  $\frac{\pi^2}{4}$   
b)  $\frac{\pi^2}{16}$   
c)  $\frac{\pi^2}{6}$   
d)  $\frac{\pi^2}{2}$

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Set **S**

**S.Y (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Engineering Mathematics - III**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions: 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I****Q.2 Answer any three questions.**

- a) Solve:  $y^2 zp + x^2 zq = xy^2$  **03**  
 b) Solve:  $p^3 + q^3 = 27z$  **03**  
 c) Solve:  $py = 2xy + \log q$  **03**  
 d) Solve:  $3x \frac{\partial z}{\partial x} - 5y \frac{\partial z}{\partial y} = 0$  by the method of separation of variables. **03**

**Q.3 a) Obtain a Fourier series of  $f(x) = x + x^2$  in the range  $-\pi < x < \pi$  **06******OR**

- a) Expand  $f(x) = e^{ax}$  as a Fourier series in interval  $(0, 2\pi)$  **06**  
 b) Obtain half range cosine series of  $f(x) = x$  in  $0 < x < 2$  **04**

**Q.4 Answer any three questions.**

- a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  using Simpson's 1/3<sup>rd</sup> rule. (Take  $h = 1$ ) **03**  
 b) Evaluate  $\int_2^3 \frac{1}{x+1} dx$  using Gaussian three points formula. **03**  
 c) Curve is drawn to pass through the points given by the following table. **03**  

|       |   |     |     |     |   |     |     |
|-------|---|-----|-----|-----|---|-----|-----|
| $x$ : | 1 | 1.5 | 2   | 2.5 | 3 | 3.5 | 4   |
| $y$ : | 2 | 2.4 | 2.7 | 2.8 | 3 | 2.6 | 2.1 |

Using Simpson's 3/8<sup>th</sup> rule, estimate the area bounded between the curve, the  $x$  – axis and the lines  $x = 1$  and  $x = 4$

d) Evaluate  $\int_0^1 \int_0^1 \frac{1}{1+x+y} dx dy$  using Trapezoidal rule Taking  $h = 0.5, k = 0.5$  **03**

**Section – II****Q.5 Answer any three questions.**

- a) Find a positive real root of the equation  $x - e^{-x} = 0$  correct to four places of decimal using Newton's Raphson method **03**  
 b) Find a positive real root of the equation  $x^3 - 3x - 7 = 0$  is one step of Muller's method. Taking three initial approximation 2, 2.5 and 3 **03**  
 c) Find the value of  $k$ , if the following function is probability density function. **03**  

$$f(x) = \frac{k}{1+x^2}, \quad -\infty < x < \infty$$

- d) From the following results obtain the two regression equations. 03
- |                    | $y$ (yield in Kg) | $x$ (rain fall in cms) |
|--------------------|-------------------|------------------------|
| Mean $\rightarrow$ | 508.4             | 26.7                   |
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- and coefficient of correlation is  $r = 0.52$

**Q.6 Attempt any three from the following.**

- a) Find a positive real root of the equation  $2x - \log_e x - 6 = 0$  correct to three decimal places by False position method 03
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- c) If 3% of bulbs manufactured by a company are defective, assuming Poisson distribution find the probability that in a pack of 100 bulbs (i) zero bulbs (ii) two bulbs are defective. 03
- d) Using Newton's Raphson iterative formula, find the approximate value of  $\sqrt{12}$  correct to three decimal places. 03

**Q.7 Attempt any two from the following.**

- a) Obtain the Karl Pearson's coefficient of correlation between export of raw material ( $x$ ) and import of finished goods ( $y$ ) from the data. 05
- |       |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|
| $x$ : | 42 | 44 | 58 | 55 | 89 | 98 | 66 |
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- b) Using Newton's Raphson method, solve the system of non-linear equations  $x^2 + y - 11 = 0$ ,  $y^2 + x - 7 = 0$  starting with the initial values  $x_0 = 3.5$ ,  $y_0 = -1.5$  (Perform two iterations). 05
- c) If the mean life time and standard deviation of battery cells are 12 hrs. and 3 hrs. What percentage of batteries will have life 05
- (i) between 10 and 14 hrs.
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- (Given: For S.N.V  $z$ , area from  $z = 0$  to  $z = 0.67$  is 0.2486, from  $z = 0$  to  $z = 1$  is 0.3413 and from  $z = 0$  to  $z = 2$  is 0.4772)

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The center of pressure acting on a vertically plane surface immersed in a liquid will be \_\_\_\_\_.  
 a) at the center of gravity      b) above the center of gravity  
 c) below the center of gravity      d) at the lowest level
- 2) Discharge of a centrifugal pump is \_\_\_\_\_.  
 a) Directly proportional to N      b) Inversely proportional to N  
 c) Directly proportional to N<sup>2</sup>      d) Inversely proportional to N<sup>2</sup>
- 3) The center of pressure and center of gravity are coincide when \_\_\_\_\_.  
 a) vertical surface immersed in the liquid  
 b) horizontal surface immersed in the liquid  
 c) inclined surface immersed in the liquid  
 d) curved surface immersed in the liquid
- 4) Buoyancy acts on a floating body \_\_\_\_\_.  
 a) vertically upward  
 b) horizontally  
 c) vertically downward  
 d) both vertically upward and horizontally
- 5) The centre of buoyancy of a submerged body \_\_\_\_\_.  
 a) coincides with the centre of gravity of the body  
 b) coincides with the centroid of the displaced volume of the fluid  
 c) is always below the centre of gravity of the body  
 d) is always above the centroid of the displaced volume of liquid
- 6) The flow field represented by the velocity vector  
 $V = axi + by^2 + cz t^2 k$   
 where a, b and c are constants, is  
 a) three-dimensional and unsteady  
 b) three-dimensional and steady  
 c) two-dimensional and steady  
 d) two-dimensional and unsteady



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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Out of remaining question, attempt any two question from each section.  
 2) Assume suitable data if required.  
 3) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve.**

- a) With neat sketch explain the conditions of the equilibrium for floating body. **04**
- b) Derive an expression for total pressure and centre of pressure on an inclined plane immersed in a liquid. **05**
- c) A rectangular plane surface 2 m wide and 3 m deep lies in water in such a way that its plane makes an angle of 30° with the free surface of water. Determine the total pressure and position of centre of pressure when the upper edge is 1.5 m below the free water surface. **05**

**Q.3 Solve.**

- a) What are different types of fluid flow? Explain with an example. **04**
- b) What is venturimeter? Derive an expression for the discharge through venturimeter. **05**
- c) The velocity vector in a fluid flow is given **05**  
 $V = 4x^3i - 10x^2yj + 2tk$   
 Find the velocity and acceleration of a fluid particle at (2, 1, 3) at time  $t = 1$

**Q.4 Solve.**

- a) Define the following terms: **04**
  - 1) Stream line
  - 2) Path line
  - 3) Streak line
  - 4) Laminar flow
- b) Derive Darcy-Weisbach equation for finding loss of head due to friction in pipes. **05**
- c) Derive a condition for maximum transmission power through a pipeline. **05**  
 What is efficiency under such conditions?

## Section – II

## Q.5 Solve.

- a) Explain the different losses that occur in the pipe line connection, with formulae. 04
- b) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if co-efficient of friction are .005, .0052 and .0048 respectively by considering: minor losses. 05
- c) The resisting force R of supersonic plane during the flight can be considered as dependent upon the length of aeroplane (l), velocity (v), dynamic viscosity ( $\mu$ ), air density ( $\rho$ ), bulk modulus (K). Express the functional relationship of these variables and the resisting force using Buckingham's  $\pi$ -theorem. 05

## Q.6 Solve:

- a) A Pelton wheel is to be designed for a head of 60 m when running at 200 r.p.m. The Pelton wheel develops 95.6475 kW shaft power. The velocity of the buckets = 0.45 times the velocity of the jet, overall efficiency = 0.85 and co-efficient of the velocity is equal to 0.98. 05
- b) A reaction turbine works at 450 r.p.m. under a head of 120 metres. Its diameter at inlet is 120 cm and the flow area is 0.4 m<sup>2</sup>. The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine:  
 1) The volume flow rate,  
 2) The power developed, and  
 3) Hydraulic efficiency.  
 Assume whirl at outlet to be zero. 05
- c) Explain governing of Pelton wheel. 04

## Q.7 Solve:

- a) What is Cavitation? What are its effects on Centrifugal Pumps? What precautions are to be taken against cavitation? 04
- b) A Kaplan turbine working under a head of 20 m develops 11772 kW shaft power. The outer diameter of the runner is 3.5 m and hub diameter is 1.75 m. The guide blade angle at the extreme edge of the runner is 35°. The hydraulic and overall efficiencies of the turbines are 88% and 84% respectively. If the velocity of whirl is zero at outlet, determine:  
 1) Runner vane angles at inlet and outlet at the extreme edge of the runner, and  
 2) Speed of the turbine 05
- c) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 r.p.m. works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40° at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm, determine:  
 1) Vane angle at inlet  
 2) Work done by impeller on water per second, and  
 3) Manometric efficiency 05

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022****MECHANICAL ENGINEERING****Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) According to Darcy's formula, the loss of head due to friction in the pipe is  
where  $f$  = coefficient of friction  
 $l$  = length of pipe  
 $V$  = average velocity of liquid in pipe, and  
 $d$  = diameter of pipe
  - a)  $4flV^2 / 2gd$
  - b)  $flV^2 / 2gd$
  - c)  $4flV / 2gd$
  - d)  $4flV^2 / gd$
- 2) For laminar flow in circular pipes, the Darcy's friction factor  $f'$  is equal to  
where  $Re$  is Reynold's, number \_\_\_\_\_.
  - a)  $16/Re$
  - b)  $32/Re$
  - c)  $64/Re$
  - d) None of the above
- 3) The Buckingham-Pi theorem is widely used in the dimensional analysis and expresses the resulting equation in terms of \_\_\_\_\_.
  - a) the dependent and independent variables
  - b)  $n$  dimensionless parameters
  - c)  $(n - m)$  dimensionless parameters
  - d) geometric, kinematic and dynamic variables
- 4) Gross head is the difference between \_\_\_\_\_.
  - a) head race and tail race
  - b) head race and net head
  - c) head race and friction losses
  - d) net head and friction losses
- 5) The blade speed ratio of impulse turbine is given as \_\_\_\_\_.
  - a) (Steam velocity at inlet) / (Blade velocity)
  - b) (Blade velocity) / (Steam velocity at exit)
  - c) (Blade velocity) / (Steam velocity at inlet)
  - d) (Steam velocity at exit) / (Blade velocity)
- 6) Pelton turbine is \_\_\_\_\_.
  - a) Tangential flow
  - b) Radial flow
  - c) Axial flow
  - d) Mixed flow





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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Fluid Mechanics & Fluid Machines**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Out of remaining question, attempt any two question from each section.  
 2) Assume suitable data if required.  
 3) Use of scientific calculator is allowed.

**Section – I**

**Q.2 Solve.**

- a) With neat sketch explain the conditions of the equilibrium for floating body. **04**
- b) Derive an expression for total pressure and centre of pressure on an inclined plane immersed in a liquid. **05**
- c) A rectangular plane surface 2 m wide and 3 m deep lies in water in such a way that its plane makes an angle of 30° with the free surface of water. Determine the total pressure and position of centre of pressure when the upper edge is 1.5 m below the free water surface. **05**

**Q.3 Solve.**

- a) What are different types of fluid flow? Explain with an example. **04**
- b) What is venturimeter? Derive an expression for the discharge through venturimeter. **05**
- c) The velocity vector in a fluid flow is given **05**  
 $V = 4x^3i - 10x^2yj + 2tk$   
 Find the velocity and acceleration of a fluid particle at (2, 1, 3) at time  $t = 1$

**Q.4 Solve.**

- a) Define the following terms: **04**
  - 1) Stream line
  - 2) Path line
  - 3) Streak line
  - 4) Laminar flow
- b) Derive Darcy-Weisbach equation for finding loss of head due to friction in pipes. **05**
- c) Derive a condition for maximum transmission power through a pipeline. **05**  
 What is efficiency under such conditions?

## Section – II

## Q.5 Solve.

- a) Explain the different losses that occur in the pipe line connection, with formulae. 04
- b) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if co-efficient of friction are .005, .0052 and .0048 respectively by considering: minor losses. 05
- c) The resisting force R of supersonic plane during the flight can be considered as dependent upon the length of aeroplane (l), velocity (v), dynamic viscosity ( $\mu$ ), air density ( $\rho$ ), bulk modulus (K). Express the functional relationship of these variables and the resisting force using Buckingham's  $\pi$ -theorem. 05

## Q.6 Solve:

- a) A Pelton wheel is to be designed for a head of 60 m when running at 200 r.p.m. The Pelton wheel develops 95.6475 kW shaft power. The velocity of the buckets = 0.45 times the velocity of the jet, overall efficiency = 0.85 and co-efficient of the velocity is equal to 0.98. 05
- b) A reaction turbine works at 450 r.p.m. under a head of 120 metres. Its diameter at inlet is 120 cm and the flow area is 0.4 m<sup>2</sup>. The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine:  
 1) The volume flow rate,  
 2) The power developed, and  
 3) Hydraulic efficiency.  
 Assume whirl at outlet to be zero. 05
- c) Explain governing of Pelton wheel. 04

## Q.7 Solve:

- a) What is Cavitation? What are its effects on Centrifugal Pumps? What precautions are to be taken against cavitation? 04
- b) A Kaplan turbine working under a head of 20 m develops 11772 kW shaft power. The outer diameter of the runner is 3.5 m and hub diameter is 1.75 m. The guide blade angle at the extreme edge of the runner is 35°. The hydraulic and overall efficiencies of the turbines are 88% and 84% respectively. If the velocity of whirl is zero at outlet, determine:  
 1) Runner vane angles at inlet and outlet at the extreme edge of the runner, and  
 2) Speed of the turbine 05
- c) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 r.p.m. works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40° at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm, determine:  
 1) Vane angle at inlet  
 2) Work done by impeller on water per second, and  
 3) Manometric efficiency 05

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Gross head is the difference between \_\_\_\_\_.  
 a) head race and tail race                      b) head race and net head  
 c) head race and friction losses              d) net head and friction losses
- 2) The blade speed ratio of impulse turbine is given as \_\_\_\_\_.  
 a) (Steam velocity at inlet) / (Blade velocity)  
 b) (Blade velocity) / (Steam velocity at exit)  
 c) (Blade velocity) / (Steam velocity at inlet)  
 d) (Steam velocity at exit) / (Blade velocity)
- 3) Pelton turbine is \_\_\_\_\_.  
 a) Tangential flow                                      b) Radial flow  
 c) Axial flow                                              d) Mixed flow
- 4) In a centrifugal pump, the liquid enters the pump \_\_\_\_\_.  
 a) At the centre                                              b) At the bottom  
 c) At the top                                                  d) From sides
- 5) The center of pressure acting on a vertically plane surface immersed in a liquid will be \_\_\_\_\_.  
 a) at the center of gravity                      b) above the center of gravity  
 c) below the center of gravity              d) at the lowest level
- 6) Discharge of a centrifugal pump is \_\_\_\_\_.  
 a) Directly proportional to N              b) Inversely proportional to N  
 c) Directly proportional to  $N^2$               d) Inversely proportional to  $N^2$
- 7) The center of pressure and center of gravity are coincide when \_\_\_\_\_.  
 a) vertical surface immersed in the liquid  
 b) horizontal surface immersed in the liquid  
 c) inclined surface immersed in the liquid  
 d) curved surface immersed in the liquid
- 8) Buoyancy acts on a floating body \_\_\_\_\_.  
 a) vertically upward  
 b) horizontally  
 c) vertically downward  
 d) both vertically upward and horizontally

- 9) The centre of buoyancy of a submerged body \_\_\_\_\_.  
 a) coincides with the centre of gravity of the body  
 b) coincides with the centroid of the displaced volume of the fluid  
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- 10) The flow field represented by the velocity vector  
 $V = axi + by^2 + czt^2k$   
 where a, b and c are constants, is  
 a) three-dimensional and unsteady  
 b) three-dimensional and steady  
 c) two-dimensional and steady  
 d) two-dimensional and unsteady
- 11) Venturi meter is advantageous because \_\_\_\_\_.  
 a) it has much smaller head loss  
 b) its accuracy is quite good  
 c) its coefficient of discharge is more than for an orifice meter  
 d) all the above
- 12) According to Darcy's formula, the loss of head due to friction in the pipe is  
 where  $f$  = coefficient of friction  
 $l$  = length of pipe  
 $V$  = average velocity of liquid in pipe, and  
 $d$  = diameter of pipe  
 a)  $4flV^2 / 2gd$   
 b)  $flV^2 / 2gd$   
 c)  $4flV / 2gd$   
 d)  $4flV^2 / gd$
- 13) For laminar flow in circular pipes, the Darcy's friction factor  $f'$  is equal to  
 where  $Re$  is Reynold's, number \_\_\_\_\_.  
 a)  $16/Re$   
 b)  $32/Re$   
 c)  $64/Re$   
 d) None of the above
- 14) The Buckingham-Pi theorem is widely used in the dimensional analysis  
 and expresses the resulting equation in terms of \_\_\_\_\_.  
 a) the dependent and independent variables  
 b)  $n$  dimensionless parameters  
 c)  $(n - m)$  dimensionless parameters  
 d) geometric, kinematic and dynamic variables

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- b) A reaction turbine works at 450 r.p.m. under a head of 120 metres. Its diameter at inlet is 120 cm and the flow area is 0.4 m<sup>2</sup>. The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine:  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The motion of a piston in the cylinder of a steam engine is an example of \_\_\_\_\_.  
 a) completely constrained motion  
 b) incompletely constrained motion  
 c) successfully constrained motion  
 d) none of these
- 2) A ball and a socket joint forms a \_\_\_\_\_.  
 a) turning pair  
 b) rolling pair  
 c) sliding pair  
 d) spherical pair
- 3) The direction of linear velocity of any point on a link with respect to another point on the same link is \_\_\_\_\_.  
 a) parallel to the link joining the points  
 b) perpendicular to the link joining the points  
 c) at 45° to the link joining the points  
 d) none of these
- 4) The component of the acceleration, parallel to the velocity of the particle, at the given instant is called \_\_\_\_\_.  
 a) radial component  
 b) Coriolis component  
 c) tangential component  
 d) None of these
- 5) A point B on a rigid link AB moves with respect to A with angular velocity  $\omega$  rad/s. The radial component of the acceleration of B with respect to A, \_\_\_\_\_.  
 a)  $V_{BA} \times AB$   
 b)  $(V_{BA})^2 / AB$   
 c)  $V_{BA} / AB$   
 d) None of these  
 Where,  $V_{BA}$  = Linear velocity of B with respect to A =  $\omega \times AB$
- 6) The size of a cam depends upon \_\_\_\_\_.  
 a) base circle  
 b) pitch circle  
 c) prime circle  
 d) pitch curve
- 7) Offset is provided to a cam follower mechanism to \_\_\_\_\_.  
 a) avoid jerk  
 b) accelerate  
 c) minimize the side thrust  
 d) none of these

- 8) An imaginary circle which by pure rolling action, gives the same motion as the actual gear, is called \_\_\_\_\_.  
a) addendum circle                      b) dedendum circle  
c) clearance circle                      d) pitch circle
- 9) The product of the diametral pitch and circular pitch is equal to \_\_\_\_\_.  
a) 1                                              b)  $\pi$   
c)  $1/\pi$                                               d)  $2\pi$
- 10) The condition of correct gearing is \_\_\_\_\_.  
a) common normal to the pitch surface cuts the line of centers at a fixed point  
b) radius of curvature of two profiles be same  
c) pitch line velocities of teeth be same  
d) none of the above
- 11) The height of a Watt's governor (in meters) is equal to \_\_\_\_\_.  
a)  $8.95/N^2$                                               b)  $89.5/N^2$   
c)  $8950/N^2$                                               d)  $895/N^2$   
where N = Speed of the arm and ball about the spindle axis.
- 12) A Hartnell governor is a \_\_\_\_\_.  
a) spring loaded governor                      b) pendulum type governor  
c) dead weight governor                      d) inertia governor
- 13) In order to have a complete balance of the several revolving masses in different planes \_\_\_\_\_.  
a) the resultant force must be zero  
b) the resultant couple must be zero  
c) both the resultant force and couple must be zero  
d) none of the above
- 14) A disturbing mass  $m_1$  attached to a rotating shaft may be balanced by a single mass  $m_2$  attached in the same plane of rotation as that of  $m_1$  such that \_\_\_\_\_.  
a)  $m_1 \cdot r_2 = m_2 \cdot r_1$                                               b)  $m_1 \cdot r_1 = m_2 \cdot r_2$   
c)  $m_1 \cdot m_2 = r_1 \cdot r_2$                                               d) None of the above

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 4) Draw neat sketches wherever necessary.  
 5) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain any two inversions of four bar chain with neat sketch. **06**  
**b)** In a pin jointed four bar mechanism, as shown in Fig. I,  $AB = 300$  mm,  $BC = CD = 360$  mm and  $AD = 600$  mm. The angle  $BAD = 60^\circ$ . The crank  $AB$  rotates uniformly at 100 rpm. Locate all the instantaneous centres and find the angular velocity of the link  $BC$ . **08**

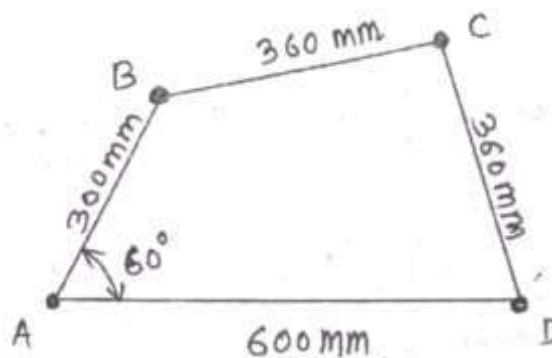


Figure-I

- Q.3 a)** An engine mechanism is shown in Fig. II. The crank  $OB = 100$  mm and the connecting rod  $BC = 300$  mm with centre of gravity  $K$ , 100 mm from  $B$ . In the position shown, the crankshaft has a speed of 75 rad/s and an angular acceleration of  $1200 \text{ rad/s}^2$ . Determine using relative velocity and acceleration method the following. **10**
- 1) Velocity of  $K$
  - 2) Angular velocity of  $CB$
  - 3) Acceleration of  $K$



- 2) Speed and sense of rotation of C.

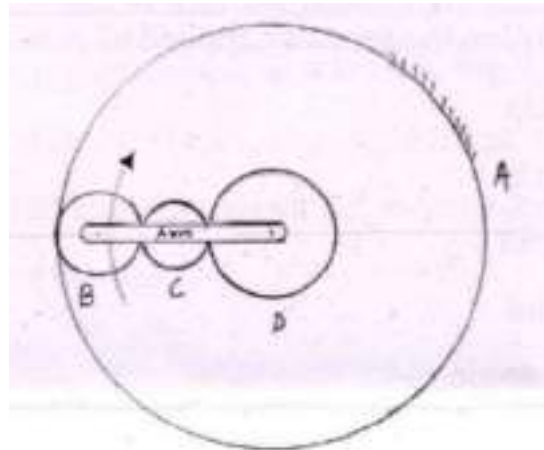


Figure - III

**Fig. III**

- Q.6 a)** A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor. **08**
- b)** Define and explain the following terms relating to governors: **06**
- 1) Stability
  - 2) Sensitiveness
  - 3) Isochronous governor
  - 4) Hunting
  - 5) Effort of a governor
  - 6) Power of a governor
- Q.7 a)** Write a short note on static balancing and dynamic balancing. **04**
- b)** Four masses A, B, C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7 kg and the radii of C and D make angles of  $90^\circ$  and  $240^\circ$  respectively with the radius of B. Find the magnitude of the masses A, C and D and the angular position of A so that the system may be completely balanced. **10**



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**S. Y. (B.Tech.) (Sem - II) (Old)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) An imaginary circle which by pure rolling action, gives the same motion as the actual gear, is called \_\_\_\_\_.  
 a) addendum circle                      b) dedendum circle  
 c) clearance circle                      d) pitch circle
- 2) The product of the diametral pitch and circular pitch is equal to \_\_\_\_\_.  
 a) 1                                              b)  $\pi$   
 c)  $1/\pi$                                           d)  $2\pi$
- 3) The condition of correct gearing is \_\_\_\_\_.  
 a) common normal to the pitch surface cuts the line of centers at a fixed point  
 b) radius of curvature of two profiles be same  
 c) pitch line velocities of teeth be same  
 d) none of the above
- 4) The height of a Watt's governor (in meters) is equal to \_\_\_\_\_.  
 a)  $8.95/N^2$                                       b)  $89.5/N^2$   
 c)  $8950/N^2$                                       d)  $895/N^2$   
 where N = Speed of the arm and ball about the spindle axis.
- 5) A Hartnell governor is a \_\_\_\_\_.  
 a) spring loaded governor                      b) pendulum type governor  
 c) dead weight governor                      d) inertia governor
- 6) In order to have a complete balance of the several revolving masses in different planes \_\_\_\_\_.  
 a) the resultant force must be zero  
 b) the resultant couple must be zero  
 c) both the resultant force and couple must be zero  
 d) none of the above



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**S. Y. (B.Tech.) (Sem - II) (Old)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

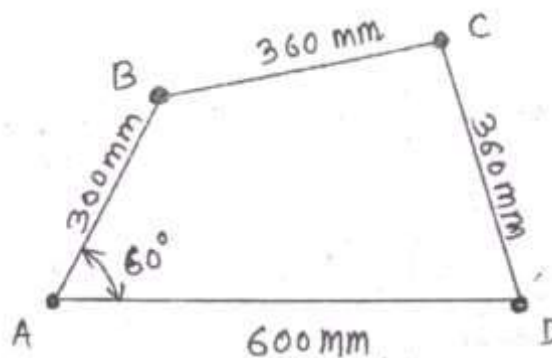
Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Draw neat sketches wherever necessary.  
 5) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain any two inversions of four bar chain with neat sketch. **06**  
**b)** In a pin jointed four bar mechanism, as shown in Fig. I,  $AB = 300$  mm,  $BC = CD = 360$  mm and  $AD = 600$  mm. The angle  $BAD = 60^\circ$ . The crank  $AB$  rotates uniformly at 100 rpm. Locate all the instantaneous centres and find the angular velocity of the link  $BC$ . **08**



- Q.3 a)** An engine mechanism is shown in Fig. II. The crank  $OB = 100$  mm and the connecting rod  $BC = 300$  mm with centre of gravity  $K$ , 100 mm from  $B$ . In the position shown, the crankshaft has a speed of 75 rad/s and an angular acceleration of  $1200 \text{ rad/s}^2$ . Determine using relative velocity and acceleration method the following. **10**
- 1) Velocity of  $K$
  - 2) Angular velocity of  $CB$
  - 3) Acceleration of  $K$

- 4) Angular acceleration of CB

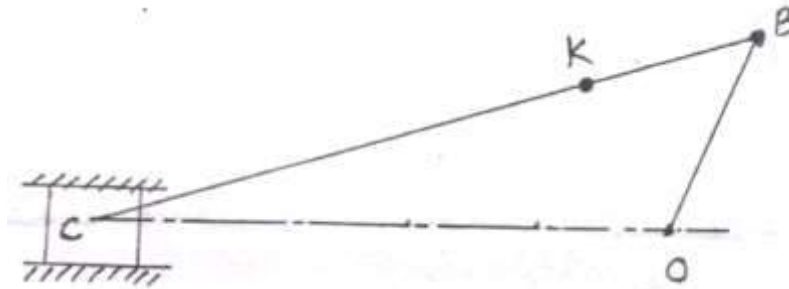


Figure-II

- b) Define kinematic pair and explain types of pairs. 04

- Q.4 a) Define the following terms as applied to cam. 06

- 1) Base circle
- 2) Pitch circle
- 3) Trace point
- 4) Pitch point
- 5) Pressure angle
- 6) Stroke of the follower

- b) A cam is to give the following motion to a knife-edged follower: 08

- 1) Outstroke during  $60^\circ$  of cam rotation;
- 2) Dwell for the next  $30^\circ$  of cam rotation;
- 3) Return stroke during next  $60^\circ$  of cam rotation, and
- 4) Dwell for the remaining  $210^\circ$  of cam rotation

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower passes through the axis of the cam shaft.

### Section – II

- Q.5 a) Differentiate between involute and cycloidal gear tooth profile. 04

- b) An epicyclic gear train, as shown in Fig. III, is composed of a fixed annular 10

wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 rpm about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively.

Find the following:

- 1) Number of teeth on C

- 2) Speed and sense of rotation of C.

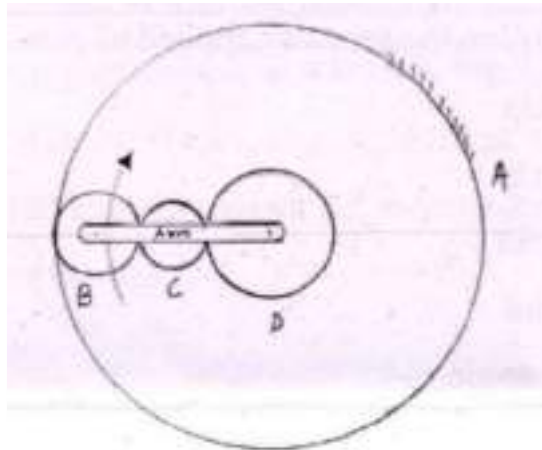


Figure - III

**Fig. III**

- Q.6 a)** A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor. **08**
- b)** Define and explain the following terms relating to governors: **06**
- 1) Stability
  - 2) Sensitiveness
  - 3) Isochronous governor
  - 4) Hunting
  - 5) Effort of a governor
  - 6) Power of a governor
- Q.7 a)** Write a short note on static balancing and dynamic balancing. **04**
- b)** Four masses A, B, C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7 kg and the radii of C and D make angles of  $90^\circ$  and  $240^\circ$  respectively with the radius of B. Find the magnitude of the masses A, C and D and the angular position of A so that the system may be completely balanced. **10**

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No.**

| Set | R |
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Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

Marks: 14

14

- Page 11 of 20

- 7) The direction of linear velocity of any point on a link with respect to another point on the same link is \_\_\_\_\_.  
 a) parallel to the link joining the points  
 b) perpendicular to the link joining the points  
 c) at  $45^\circ$  to the link joining the points  
 d) none of these
- 8) The component of the acceleration, parallel to the velocity of the particle, at the given instant is called \_\_\_\_\_.  
 a) radial component  
 b) Coriolis component  
 c) tangential component  
 d) None of these
- 9) A point B on a rigid link AB moves with respect to A with angular velocity  $\omega$  rad/s. The radial component of the acceleration of B with respect to A, \_\_\_\_\_.  
 a)  $V_{BA} \times AB$   
 b)  $(V_{BA})^2 / AB$   
 c)  $V_{BA} / AB$   
 d) None of these
- Where,  $V_{BA}$  = Linear velocity of B with respect to A =  $\omega \times AB$
- 10) The size of a cam depends upon \_\_\_\_\_.  
 a) base circle  
 b) pitch circle  
 c) prime circle  
 d) pitch curve
- 11) Offset is provided to a cam follower mechanism to \_\_\_\_\_.  
 a) avoid jerk  
 b) accelerate  
 c) minimize the side thrust  
 d) none of these
- 12) An imaginary circle which by pure rolling action, gives the same motion as the actual gear, is called \_\_\_\_\_.  
 a) addendum circle  
 b) dedendum circle  
 c) clearance circle  
 d) pitch circle
- 13) The product of the diametral pitch and circular pitch is equal to \_\_\_\_\_.  
 a) 1  
 b)  $\pi$   
 c)  $1/\pi$   
 d)  $2\pi$
- 14) The condition of correct gearing is \_\_\_\_\_.  
 a) common normal to the pitch surface cuts the line of centers at a fixed point  
 b) radius of curvature of two profiles be same  
 c) pitch line velocities of teeth be same  
 d) none of the above

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**S. Y. (B.Tech.) (Sem - II) (Old)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Draw neat sketches wherever necessary.  
 5) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain any two inversions of four bar chain with neat sketch. **06**  
**b)** In a pin jointed four bar mechanism, as shown in Fig. I,  $AB = 300$  mm,  $BC = CD = 360$  mm and  $AD = 600$  mm. The angle  $BAD = 60^\circ$ . The crank  $AB$  rotates uniformly at 100 rpm. Locate all the instantaneous centres and find the angular velocity of the link  $BC$ . **08**

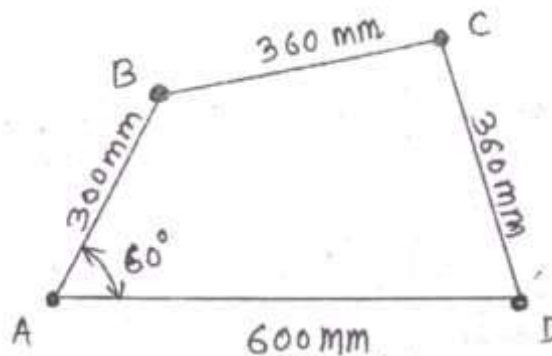


Figure-I

- Q.3 a)** An engine mechanism is shown in Fig. II. The crank  $OB = 100$  mm and the connecting rod  $BC = 300$  mm with centre of gravity  $K$ , 100 mm from  $B$ . In the position shown, the crankshaft has a speed of 75 rad/s and an angular acceleration of  $1200 \text{ rad/s}^2$ . Determine using relative velocity and acceleration method the following. **10**
- 1) Velocity of  $K$
  - 2) Angular velocity of  $CB$
  - 3) Acceleration of  $K$



- 4) Angular acceleration of CB

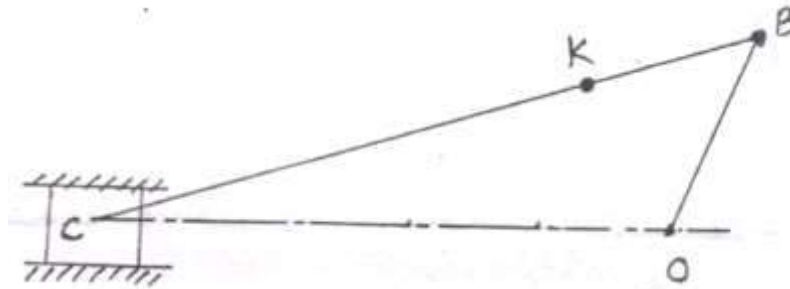


Figure-II

- b) Define kinematic pair and explain types of pairs. 04

- Q.4 a) Define the following terms as applied to cam. 06

- 1) Base circle
- 2) Pitch circle
- 3) Trace point
- 4) Pitch point
- 5) Pressure angle
- 6) Stroke of the follower

- b) A cam is to give the following motion to a knife-edged follower: 08

- 1) Outstroke during  $60^\circ$  of cam rotation;
- 2) Dwell for the next  $30^\circ$  of cam rotation;
- 3) Return stroke during next  $60^\circ$  of cam rotation, and
- 4) Dwell for the remaining  $210^\circ$  of cam rotation

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower passes through the axis of the cam shaft.

### Section – II

- Q.5 a) Differentiate between involute and cycloidal gear tooth profile. 04

- b) An epicyclic gear train, as shown in Fig. III, is composed of a fixed annular wheel A having 150 teeth. The wheel A is meshing with wheel B which 10

drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 rpm about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively.

Find the following:

- 1) Number of teeth on C

- 2) Speed and sense of rotation of C.

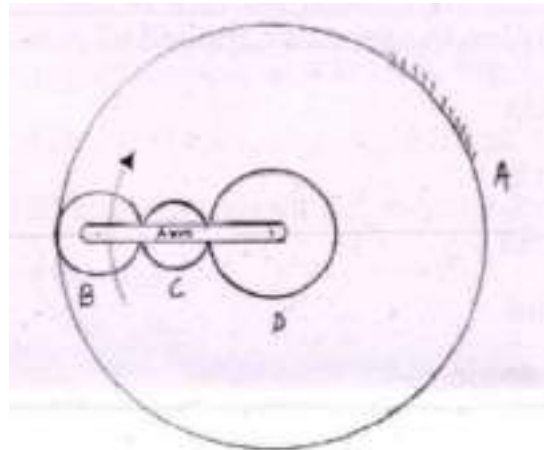


Figure - III

**Fig. III**

- Q.6 a)** A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor. **08**
- b)** Define and explain the following terms relating to governors: **06**
- 1) Stability
  - 2) Sensitiveness
  - 3) Isochronous governor
  - 4) Hunting
  - 5) Effort of a governor
  - 6) Power of a governor
- Q.7 a)** Write a short note on static balancing and dynamic balancing. **04**
- b)** Four masses A, B, C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7 kg and the radii of C and D make angles of  $90^\circ$  and  $240^\circ$  respectively with the radius of B. Find the magnitude of the masses A, C and D and the angular position of A so that the system may be completely balanced. **10**

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Max. Marks: 70

Marks: 14

14

- Page 16 of 20

- 8) In order to have a complete balance of the several revolving masses in different planes \_\_\_\_\_.  
 a) the resultant force must be zero  
 b) the resultant couple must be zero  
 c) both the resultant force and couple must be zero  
 d) none of the above
- 9) A disturbing mass  $m_1$  attached to a rotating shaft may be balanced by a single mass  $m_2$  attached in the same plane of rotation as that of  $m_1$  such that \_\_\_\_\_.  
 a)  $m_1 \cdot r_2 = m_2 \cdot r_1$   
 b)  $m_1 \cdot r_1 = m_2 \cdot r_2$   
 c)  $m_1 \cdot m_2 = r_1 \cdot r_2$   
 d) None of the above
- 10) The motion of a piston in the cylinder of a steam engine is an example of \_\_\_\_\_.  
 a) completely constrained motion  
 b) incompletely constrained motion  
 c) successfully constrained motion  
 d) none of these
- 11) A ball and a socket joint forms a \_\_\_\_\_.  
 a) turning pair  
 b) rolling pair  
 c) sliding pair  
 d) spherical pair
- 12) The direction of linear velocity of any point on a link with respect to another point on the same link is \_\_\_\_\_.  
 a) parallel to the link joining the points  
 b) perpendicular to the link joining the points  
 c) at  $45^\circ$  to the link joining the points  
 d) none of these
- 13) The component of the acceleration, parallel to the velocity of the particle, at the given instant is called \_\_\_\_\_.  
 a) radial component  
 b) Coriolis component  
 c) tangential component  
 d) None of these
- 14) A point B on a rigid link AB moves with respect to A with angular velocity  $\omega$  rad/s. The radial component of the acceleration of B with respect to A, \_\_\_\_\_.  
 a)  $V_{BA} \times AB$   
 b)  $(V_{BA})^2 / AB$   
 c)  $V_{BA} / AB$   
 d) None of these

Where,  $V_{BA}$  = Linear velocity of B with respect to A =  $\omega \times AB$

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Set **S**

**S. Y. (B.Tech.) (Sem - II) (Old)(CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Kinematics & Theory of Machines**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Draw neat sketches wherever necessary.  
 5) Assume suitable data if necessary and state it clearly.

**Section – I**

- Q.2 a)** Explain any two inversions of four bar chain with neat sketch. **06**  
**b)** In a pin jointed four bar mechanism, as shown in Fig. I,  $AB = 300$  mm,  $BC = CD = 360$  mm and  $AD = 600$  mm. The angle  $BAD = 60^\circ$ . The crank  $AB$  rotates uniformly at 100 rpm. Locate all the instantaneous centres and find the angular velocity of the link  $BC$ . **08**

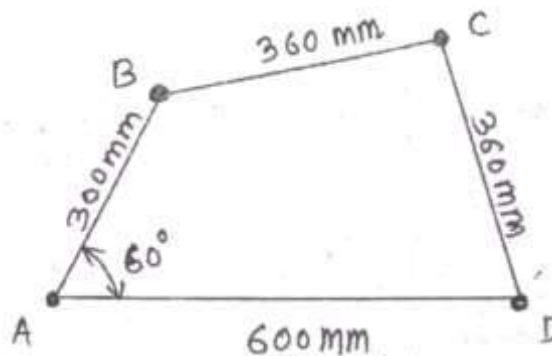


Figure-I

- Q.3 a)** An engine mechanism is shown in Fig. II. The crank  $OB = 100$  mm and the connecting rod  $BC = 300$  mm with centre of gravity  $K$ , 100 mm from  $B$ . In the position shown, the crankshaft has a speed of 75 rad/s and an angular acceleration of  $1200 \text{ rad/s}^2$ . Determine using relative velocity and acceleration method the following. **10**
- 1) Velocity of  $K$
  - 2) Angular velocity of  $CB$
  - 3) Acceleration of  $K$

- 4) Angular acceleration of CB

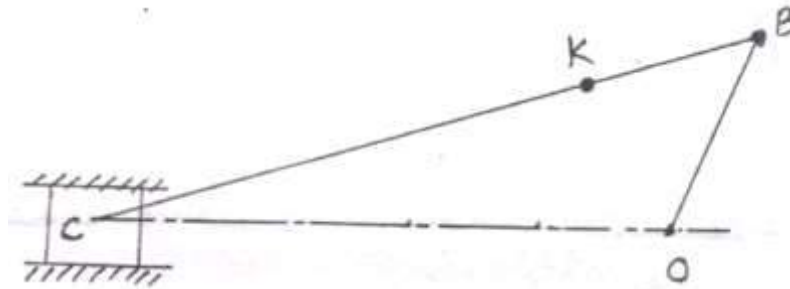


Figure-II

- b) Define kinematic pair and explain types of pairs. 04

- Q.4 a) Define the following terms as applied to cam. 06

- 1) Base circle
- 2) Pitch circle
- 3) Trace point
- 4) Pitch point
- 5) Pressure angle
- 6) Stroke of the follower

- b) A cam is to give the following motion to a knife-edged follower: 08

- 1) Outstroke during  $60^\circ$  of cam rotation;
- 2) Dwell for the next  $30^\circ$  of cam rotation;
- 3) Return stroke during next  $60^\circ$  of cam rotation, and
- 4) Dwell for the remaining  $210^\circ$  of cam rotation

The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower passes through the axis of the cam shaft.

### Section – II

- Q.5 a) Differentiate between involute and cycloidal gear tooth profile. 04

- b) An epicyclic gear train, as shown in Fig. III, is composed of a fixed annular 10

wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100 rpm about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively.

Find the following:

- 1) Number of teeth on C

- 2) Speed and sense of rotation of C.

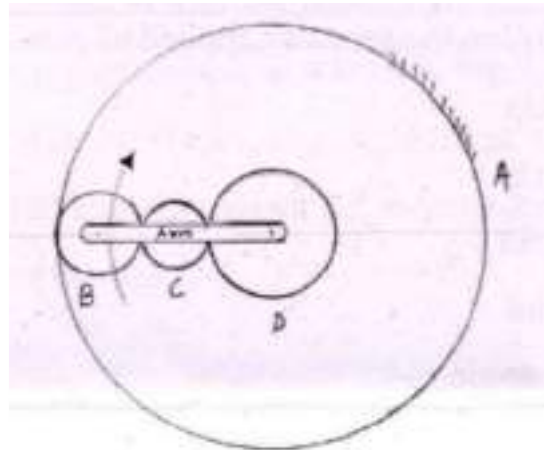


Figure - III

**Fig. III**

- Q.6 a)** A Porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor. **08**
- b)** Define and explain the following terms relating to governors: **06**
- 1) Stability
  - 2) Sensitiveness
  - 3) Isochronous governor
  - 4) Hunting
  - 5) Effort of a governor
  - 6) Power of a governor
- Q.7 a)** Write a short note on static balancing and dynamic balancing. **04**
- b)** Four masses A, B, C and D revolve at equal radii and are equally spaced along a shaft. The mass B is 7 kg and the radii of C and D make angles of  $90^\circ$  and  $240^\circ$  respectively with the radius of B. Find the magnitude of the masses A, C and D and the angular position of A so that the system may be completely balanced. **10**

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Where and when was the word Mechatronics invented?
 

|                  |                  |
|------------------|------------------|
| a) Japan (1960)  | b) Japan (1980)  |
| c) Europe (1960) | d) Europe (1980) |
- 2) A servo motor is a typical example of \_\_\_\_\_.
 

|                       |                        |
|-----------------------|------------------------|
| a) Electronics system | b) Mechanical system   |
| c) Computer system    | d) Mechatronics system |
- 3) What is the function of an input signal conditioning unit?
 

|                                                           |
|-----------------------------------------------------------|
| a) To produce control signals                             |
| b) To amplify the signal and convert it into digital form |
| c) To perform mechanical work                             |
| d) To produce electrical signals                          |
- 4) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.
 

|                                     |
|-------------------------------------|
| a) Mutual Inductance                |
| b) Self Inductance                  |
| c) Variable Resistance Transduction |
| d) Hall Effect                      |
- 5) LIDAR stands for \_\_\_\_\_.
 

|                                  |
|----------------------------------|
| a) Light Detection and Radiation |
| b) Light Detection and Ranging   |
| c) Lithium Detector and Radiator |
| d) Lithium Detection and Ranging |
- 6) A microcontroller at-least should consist of \_\_\_\_\_.
 

|                                        |
|----------------------------------------|
| a) RAM, ROM, I/O ports and timers      |
| b) CPU, RAM, I/O ports and timers      |
| c) CPU, RAM, ROM, I/O ports and timers |
| d) CPU, ROM, I/O ports and timers      |
- 7) Unlike microprocessors, microcontrollers make use of batteries because they have:
 

|                            |                            |
|----------------------------|----------------------------|
| a) high power dissipation  | b) low power consumption   |
| c) low voltage consumption | d) low current consumption |



- 8) Which is a false statement regarding DAQ (Data acquisition) systems?
- a) It can measure physical phenomenon which can be sampled
  - b) Signal conditioning can be done
  - c) DAQ system can generate its own physical sample sets
  - d) Analog to digital conversion can be done
- 9) Which conversion takes place when music is played from a memory card?
- a) AAC
  - b) ADC
  - c) DDC
  - d) DAC
- 10) Which is not a property of group drive?
- a) Less initial cost than individual drive
  - b) Less maintenance cost than individual drive
  - c) Low power factor
  - d) Provides constant motor speed
- 11) IEEE 488 is more commonly known as:
- a) GPIB
  - b) PCI Express
  - c) FireWire
  - d) Serial ATA
- 12) The programmable logic controllers are used in \_\_\_\_.
- a) Manufacturing
  - b) Automation
  - c) Both a and b
  - d) None of the above
- 13) What are the components that make the programmable logic controller work?
- a) Input and output module
  - b) CPU
  - c) Power supply
  - d) All of the above
- 14) Which transmission media provides the highest transmission speed in a network?
- a) coaxial cable
  - b) twisted pair cable
  - c) optical fiber
  - d) electrical cable

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**Set P**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from Section-I and Section-II.  
2) Figures to the right indicate full marks.

**Section – I**

- |            |                                                                                         |           |
|------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Explain key elements of mechatronic system.                                   | <b>07</b> |
|            | <b>b)</b> Explain application of mechatronics in car engine management.                 | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain classification of sensors.                                            | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch linear and rotary variable differential transformer. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain features of 8085 microprocessor.                                      | <b>07</b> |
|            | <b>b)</b> Differentiate between microprocessor and microcontroller.                     | <b>07</b> |

**Section – II**

- |            |                                                                                                                 |           |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> What is meant by signal conditioning and what are the different types of signal conditioner?          | <b>07</b> |
|            | <b>b)</b> Explain signal processing. How signal processing is done and write applications of signal processing. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain basic architecture of PLC.                                                                    | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch NPN and PNP sourcing and sinking circuits.                                   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> What is computer network? Explain key components of computer networks.                                | <b>07</b> |
|            | <b>b)</b> Define Network Topology. Explain any two network topologies.                                          | <b>07</b> |

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Set **Q**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which is a false statement regarding DAQ (Data acquisition) systems?
  - a) It can measure physical phenomenon which can be sampled
  - b) Signal conditioning can be done
  - c) DAQ system can generate its own physical sample sets
  - d) Analog to digital conversion can be done
- 2) Which conversion takes place when music is played from a memory card?
  - a) AAC
  - b) ADC
  - c) DDC
  - d) DAC
- 3) Which is not a property of group drive?
  - a) Less initial cost than individual drive
  - b) Less maintenance cost than individual drive
  - c) Low power factor
  - d) Provides constant motor speed
- 4) IEEE 488 is more commonly known as:
  - a) GPIB
  - b) PCI Express
  - c) FireWire
  - d) Serial ATA
- 5) The programmable logic controllers are used in \_\_\_\_\_.
  - a) Manufacturing
  - b) Automation
  - c) Both a and b
  - d) None of the above
- 6) What are the components that make the programmable logic controller work?
  - a) Input and output module
  - b) CPU
  - c) Power supply
  - d) All of the above
- 7) Which transmission media provides the highest transmission speed in a network?
  - a) coaxial cable
  - b) twisted pair cable
  - c) optical fiber
  - d) electrical cable
- 8) Where and when was the word Mechatronics invented?
  - a) Japan (1960)
  - b) Japan (1980)
  - c) Europe (1960)
  - d) Europe (1980)

- 9) A servo motor is a typical example of \_\_\_\_\_.  
a) Electronics system                      b) Mechanical system  
c) Computer system                        d) Mechatronics system
- 10) What is the function of an input signal conditioning unit?  
a) To produce control signals  
b) To amplify the signal and convert it into digital form  
c) To perform mechanical work  
d) To produce electrical signals
- 11) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.  
a) Mutual Inductance  
b) Self Inductance  
c) Variable Resistance Transduction  
d) Hall Effect
- 12) LIDAR stands for \_\_\_\_\_.  
a) Light Detection and Radiation  
b) Light Detection and Ranging  
c) Lithium Detector and Radiator  
d) Lithium Detection and Ranging
- 13) A microcontroller at-least should consist of \_\_\_\_\_.  
a) RAM, ROM, I/O ports and timers  
b) CPU, RAM, I/O ports and timers  
c) CPU, RAM, ROM, I/O ports and timers  
d) CPU, ROM, I/O ports and timers
- 14) Unlike microprocessors, microcontrollers make use of batteries because they have:  
a) high power dissipation                      b) low power consumption  
c) low voltage consumption                      d) low current consumption

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**Set Q**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from Section-I and Section-II.  
2) Figures to the right indicate full marks.

**Section – I**

- |            |                                                                                         |           |
|------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Explain key elements of mechatronic system.                                   | <b>07</b> |
|            | <b>b)</b> Explain application of mechatronics in car engine management.                 | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain classification of sensors.                                            | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch linear and rotary variable differential transformer. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain features of 8085 microprocessor.                                      | <b>07</b> |
|            | <b>b)</b> Differentiate between microprocessor and microcontroller.                     | <b>07</b> |

**Section – II**

- |            |                                                                                                                 |           |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> What is meant by signal conditioning and what are the different types of signal conditioner?          | <b>07</b> |
|            | <b>b)</b> Explain signal processing. How signal processing is done and write applications of signal processing. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain basic architecture of PLC.                                                                    | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch NPN and PNP sourcing and sinking circuits.                                   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> What is computer network? Explain key components of computer networks.                                | <b>07</b> |
|            | <b>b)</b> Define Network Topology. Explain any two network topologies.                                          | <b>07</b> |

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Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 14

14

- Page 7 of 12

- 9) LIDAR stands for \_\_\_\_\_.  
a) Light Detection and Radiation  
b) Light Detection and Ranging  
c) Lithium Detector and Radiator  
d) Lithium Detection and Ranging
- 10) A microcontroller at-least should consist of \_\_\_\_\_.  
a) RAM, ROM, I/O ports and timers  
b) CPU, RAM, I/O ports and timers  
c) CPU, RAM, ROM, I/O ports and timers  
d) CPU, ROM, I/O ports and timers
- 11) Unlike microprocessors, microcontrollers make use of batteries because they have:  
a) high power dissipation                      b) low power consumption  
c) low voltage consumption                  d) low current consumption
- 12) Which is a false statement regarding DAQ (Data acquisition) systems?  
a) It can measure physical phenomenon which can be sampled  
b) Signal conditioning can be done  
c) DAQ system can generate its own physical sample sets  
d) Analog to digital conversion can be done
- 13) Which conversion takes place when music is played from a memory card?  
a) AAC                                              b) ADC  
c) DDC                                              d) DAC
- 14) Which is not a property of group drive?  
a) Less initial cost than individual drive  
b) Less maintenance cost than individual drive  
c) Low power factor  
d) Provides constant motor speed

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from Section-I and Section-II.  
2) Figures to the right indicate full marks.

**Section – I**

- |            |                                                                                         |           |
|------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Explain key elements of mechatronic system.                                   | <b>07</b> |
|            | <b>b)</b> Explain application of mechatronics in car engine management.                 | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain classification of sensors.                                            | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch linear and rotary variable differential transformer. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain features of 8085 microprocessor.                                      | <b>07</b> |
|            | <b>b)</b> Differentiate between microprocessor and microcontroller.                     | <b>07</b> |

**Section – II**

- |            |                                                                                                                 |           |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> What is meant by signal conditioning and what are the different types of signal conditioner?          | <b>07</b> |
|            | <b>b)</b> Explain signal processing. How signal processing is done and write applications of signal processing. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain basic architecture of PLC.                                                                    | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch NPN and PNP sourcing and sinking circuits.                                   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> What is computer network? Explain key components of computer networks.                                | <b>07</b> |
|            | <b>b)</b> Define Network Topology. Explain any two network topologies.                                          | <b>07</b> |



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| <b>Set</b> | <b>S</b> |
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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A microcontroller at-least should consist of \_\_\_\_\_.  
 a) RAM, ROM, I/O ports and timers  
 b) CPU, RAM, I/O ports and timers  
 c) CPU, RAM, ROM, I/O ports and timers  
 d) CPU, ROM, I/O ports and timers
- 2) Unlike microprocessors, microcontrollers make use of batteries because they have:  
 a) high power dissipation                      b) low power consumption  
 c) low voltage consumption                      d) low current consumption
- 3) Which is a false statement regarding DAQ (Data acquisition) systems?  
 a) It can measure physical phenomenon which can be sampled  
 b) Signal conditioning can be done  
 c) DAQ system can generate its own physical sample sets  
 d) Analog to digital conversion can be done
- 4) Which conversion takes place when music is played from a memory card?  
 a) AAC                                                      b) ADC  
 c) DDC                                                      d) DAC
- 5) Which is not a property of group drive?  
 a) Less initial cost than individual drive  
 b) Less maintenance cost than individual drive  
 c) Low power factor  
 d) Provides constant motor speed
- 6) IEEE 488 is more commonly known as:  
 a) GPIB                                                      b) PCI Express  
 c) FireWire                                                      d) Serial ATA
- 7) The programmable logic controllers are used in \_\_\_\_\_.  
 a) Manufacturing                                                      b) Automation  
 c) Both a and b                                                      d) None of the above

- 8) What are the components that make the programmable logic controller work?
- a) Input and output module
  - b) CPU
  - c) Power supply
  - d) All of the above
- 9) Which transmission media provides the highest transmission speed in a network?
- a) coaxial cable
  - b) twisted pair cable
  - c) optical fiber
  - d) electrical cable
- 10) Where and when was the word Mechatronics invented?
- a) Japan (1960)
  - b) Japan (1980)
  - c) Europe (1960)
  - d) Europe (1980)
- 11) A servo motor is a typical example of \_\_\_\_\_.
- a) Electronics system
  - b) Mechanical system
  - c) Computer system
  - d) Mechatronics system
- 12) What is the function of an input signal conditioning unit?
- a) To produce control signals
  - b) To amplify the signal and convert it into digital form
  - c) To perform mechanical work
  - d) To produce electrical signals
- 13) Potentiometer as a displacement sensor works on the principle of \_\_\_\_\_.
- a) Mutual Inductance
  - b) Self Inductance
  - c) Variable Resistance Transduction
  - d) Hall Effect
- 14) LIDAR stands for \_\_\_\_\_.
- a) Light Detection and Radiation
  - b) Light Detection and Ranging
  - c) Lithium Detector and Radiator
  - d) Lithium Detection and Ranging

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**Set S**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Mechatronic Systems**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Solve any two questions from Section-I and Section-II.  
2) Figures to the right indicate full marks.

**Section – I**

- |            |                                                                                         |           |
|------------|-----------------------------------------------------------------------------------------|-----------|
| <b>Q.2</b> | <b>a)</b> Explain key elements of mechatronic system.                                   | <b>07</b> |
|            | <b>b)</b> Explain application of mechatronics in car engine management.                 | <b>07</b> |
| <b>Q.3</b> | <b>a)</b> Explain classification of sensors.                                            | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch linear and rotary variable differential transformer. | <b>07</b> |
| <b>Q.4</b> | <b>a)</b> Explain features of 8085 microprocessor.                                      | <b>07</b> |
|            | <b>b)</b> Differentiate between microprocessor and microcontroller.                     | <b>07</b> |

**Section – II**

- |            |                                                                                                                 |           |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Q.5</b> | <b>a)</b> What is meant by signal conditioning and what are the different types of signal conditioner?          | <b>07</b> |
|            | <b>b)</b> Explain signal processing. How signal processing is done and write applications of signal processing. | <b>07</b> |
| <b>Q.6</b> | <b>a)</b> Explain basic architecture of PLC.                                                                    | <b>07</b> |
|            | <b>b)</b> Explain with neat sketch NPN and PNP sourcing and sinking circuits.                                   | <b>07</b> |
| <b>Q.7</b> | <b>a)</b> What is computer network? Explain key components of computer networks.                                | <b>07</b> |
|            | <b>b)</b> Define Network Topology. Explain any two network topologies.                                          | <b>07</b> |

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| Set | P |
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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant Engineering**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A load curve is a plot of \_\_\_\_\_.  
 a) Load versus generation capacity  
 b) Load versus current  
 c) Load versus cost of power  
 d) Load versus time
- 2) An Inspection survey and analysis of energy flows for energy conservation in a building is called as \_\_\_\_\_.  
 a) Energy Management  
 b) Energy Audit  
 c) Energy Conservation  
 d) None of above
- 3) The solar constant value is \_\_\_\_\_.  
 a) 1327 W/m<sup>2</sup>  
 b) 1366 W/m<sup>2</sup>  
 c) 1357 W/m<sup>2</sup>  
 d) 1377 W/m<sup>2</sup>
- 4) Which of the following power plant have longest physical life?  
 a) Thermal power plant  
 b) Nuclear power plant  
 c) Hydroelectric power plant  
 d) Diesel power plant
- 5) In hydroelectric power, what is necessary for the production of power throughout the Year?  
 a) Dams filled with water  
 b) High amount of air  
 c) High intense sunlight  
 d) Nuclear power
- 6) A system has a connected load of 100 kW, the peak load of 80 kW. base load of 20 kW and an average load of 40 kW, will have a load factor of \_\_\_\_\_.  
 a) 40%  
 b) 50%  
 c) 60%  
 d) 80%
- 7) What does WECS stands for?  
 a) Wind energy conversion system  
 b) Wind engine control system  
 c) Wind energy combined system  
 d) Wind engine comparison system



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Set

P

**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant Engineering**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Assume additional suitable data, if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the different types of Load Curves? Explain any one in detail with a neat sketch. **05**  
 b) What is Tariff? Explain any one Tariff Method. **05**  
 c) Explain in short Straight Line Method of Depreciation with figure. **04**
- Q.3** a) Explain the role of NTPC and NPCIL in Power Development. **05**  
 b) Write a short note on the role of Power Grid Corporation in India (PGCIL). **04**  
 c) Explain the requirement of Compressed Air Storage Plants. **05**
- Q.4** a) What are the various factors considered during Selection of Site for Power Station? **05**  
 b) The load supplied by a power station is given below: **05**

| Time (Hr.) | 0 - 6 | 6 - 12 | 12 - 14 | 14 - 18 | 18 - 24 |
|------------|-------|--------|---------|---------|---------|
| Load (MW)  | 35    | 90     | 70      | 100     | 50      |

Draw the load curve & load duration curve. Determine plant capacity factor if plant capacity is 150 MW.

- c) Explain in short the role of the Private Sector in India for Power development. **04**

**Section – II**

- Q.5** a) Write a short note on Pyranometer. **05**  
 b) What is the role of energy audit in energy conservation? **04**  
 c) What is Tidal Energy? Explain Single Basin System Tidal Power Plant. **05**
- Q.6** a) What are the types of Energy Audit? Explain any one in detail. **05**  
 b) What are the Non-concentrating types Collectors? Explain Liquid Flat Plate Collector with a neat sketch. **05**  
 c) Explain with a neat sketch Closed OTEC Cycle Power Plant. **04**

- Q.7**
- |           |                                                                              |           |
|-----------|------------------------------------------------------------------------------|-----------|
| <b>a)</b> | Give a list and explain in short different energy audit instruments.         | <b>05</b> |
| <b>b)</b> | Give classification of wind mill and state its advantages and disadvantages. | <b>05</b> |
| <b>c)</b> | Define the following terms with neat sketch:                                 | <b>04</b> |
|           | 1) Latitude                                                                  |           |
|           | 2) Hour Angle                                                                |           |
|           | 3) Altitude                                                                  |           |
|           | 4) Solar Azimuth Angle                                                       |           |

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Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

Marks: 14

14

- Page 5 of 16



- 9) An Inspection survey and analysis of energy flows for energy conservation in a building is called as \_\_\_\_\_.  
a) Energy Management                      b) Energy Audit  
c) Energy Conservation                    d) None of above
- 10) The solar constant value is \_\_\_\_\_.  
a)  $1327 \text{ W/m}^2$                                   b)  $1366 \text{ W/m}^2$   
c)  $1357 \text{ W/m}^2$                                   d)  $1377 \text{ W/m}^2$
- 11) Which of the following power plant have longest physical life?  
a) Thermal power plant                      b) Nuclear power plant  
c) Hydroelectric power plant                d) Diesel power plant
- 12) In hydroelectric power, what is necessary for the production of power throughout the Year?  
a) Dams filled with water                    b) High amount of air  
c) High intense sunlight                      d) Nuclear power
- 13) A system has a connected load of 100 kW, the peak load of 80 kW. base load of 20 kW and an average load of 40 kW, will have a load factor of \_\_\_\_\_.  
a) 40%                                              b) 50%  
c) 60%                                              d) 80%
- 14) What does WECS stands for?  
a) Wind energy conversion system  
b) Wind engine control system  
c) Wind energy combined system  
d) Wind engine comparison system

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| Seat No. |  |
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| Set | Q |
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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant Engineering**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Assume additional suitable data, if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the different types of Load Curves? Explain any one in detail with a neat sketch. **05**  
 b) What is Tariff? Explain any one Tariff Method. **05**  
 c) Explain in short Straight Line Method of Depreciation with figure. **04**
- Q.3** a) Explain the role of NTPC and NPCIL in Power Development. **05**  
 b) Write a short note on the role of Power Grid Corporation in India (PGCIL). **04**  
 c) Explain the requirement of Compressed Air Storage Plants. **05**
- Q.4** a) What are the various factors considered during Selection of Site for Power Station? **05**  
 b) The load supplied by a power station is given below: **05**

| Time (Hr.) | 0 - 6 | 6 - 12 | 12 - 14 | 14 - 18 | 18 - 24 |
|------------|-------|--------|---------|---------|---------|
| Load (MW)  | 35    | 90     | 70      | 100     | 50      |

Draw the load curve & load duration curve. Determine plant capacity factor if plant capacity is 150 MW.

- c) Explain in short the role of the Private Sector in India for Power development. **04**

**Section – II**

- Q.5** a) Write a short note on Pyranometer. **05**  
 b) What is the role of energy audit in energy conservation? **04**  
 c) What is Tidal Energy? Explain Single Basin System Tidal Power Plant. **05**
- Q.6** a) What are the types of Energy Audit? Explain any one in detail. **05**  
 b) What are the Non-concentrating types Collectors? Explain Liquid Flat Plate Collector with a neat sketch. **05**  
 c) Explain with a neat sketch Closed OTEC Cycle Power Plant. **04**

- Q.7**
- |           |                                                                              |           |
|-----------|------------------------------------------------------------------------------|-----------|
| <b>a)</b> | Give a list and explain in short different energy audit instruments.         | <b>05</b> |
| <b>b)</b> | Give classification of wind mill and state its advantages and disadvantages. | <b>05</b> |
| <b>c)</b> | Define the following terms with neat sketch:                                 | <b>04</b> |
|           | 1) Latitude                                                                  |           |
|           | 2) Hour Angle                                                                |           |
|           | 3) Altitude                                                                  |           |
|           | 4) Solar Azimuth Angle                                                       |           |

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant Engineering**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following power plant cannot be used as a base load plant?
 

|                              |                         |
|------------------------------|-------------------------|
| a) Hydroelectric power plant | b) Diesel elected plant |
| c) Nuclear power plant       | d) Thermal power plant  |
- 2) Kinetic energy that results from the oscillation of water is called \_\_\_\_\_.
 

|                         |                 |
|-------------------------|-----------------|
| a) Wave energy          | b) Tidal energy |
| c) Ocean thermal energy | d) Hydro energy |
- 3) Economiser is used to heat \_\_\_\_\_.
 

|               |                     |
|---------------|---------------------|
| a) Feed water | b) Air              |
| c) Flue gases | d) All of the above |
- 4) Which Meter is used to measure the Beam Radiations?
 

|                  |                      |
|------------------|----------------------|
| a) Pyrheliometer | b) Sunshine Recorder |
| c) Anemometer    | d) All of the above  |
- 5) A load curve is a plot of \_\_\_\_\_.
 

|                                    |
|------------------------------------|
| a) Load versus generation capacity |
| b) Load versus current             |
| c) Load versus cost of power       |
| d) Load versus time                |
- 6) An Inspection survey and analysis of energy flows for energy conservation in a building is called as \_\_\_\_\_.
 

|                        |                  |
|------------------------|------------------|
| a) Energy Management   | b) Energy Audit  |
| c) Energy Conservation | d) None of above |
- 7) The solar constant value is \_\_\_\_\_.
 

|                          |                          |
|--------------------------|--------------------------|
| a) 1327 W/m <sup>2</sup> | b) 1366 W/m <sup>2</sup> |
| c) 1357 W/m <sup>2</sup> | d) 1377 W/m <sup>2</sup> |
- 8) Which of the following power plant have longest physical life?
 

|                              |                        |
|------------------------------|------------------------|
| a) Thermal power plant       | b) Nuclear power plant |
| c) Hydroelectric power plant | d) Diesel power plant  |

- 9) In hydroelectric power, what is necessary for the production of power throughout the Year?
- |                           |                       |
|---------------------------|-----------------------|
| a) Dams filled with water | b) High amount of air |
| c) High intense sunlight  | d) Nuclear power      |
- 10) A system has a connected load of 100 kW, the peak load of 80 kW. base load of 20 kW and an average load of 40 kW, will have a load factor of \_\_\_\_.
- |        |        |
|--------|--------|
| a) 40% | b) 50% |
| c) 60% | d) 80% |
- 11) What does WECS stands for?
- |                                  |                                  |
|----------------------------------|----------------------------------|
| a) Wind energy conversion system | b) Wind engine control system    |
| c) Wind energy combined system   | d) Wind engine comparison system |
- 12) Energy conservation act was formed in the year \_\_\_\_.
- |         |         |
|---------|---------|
| a) 1998 | b) 1999 |
| c) 2001 | d) 2000 |
- 13) The Function of solar collectors to convert \_\_\_\_.
- |                                     |                                 |
|-------------------------------------|---------------------------------|
| a) Solar energy into electricity    | b) Solar energy into radiations |
| c) Solar energy into thermal energy | d) none of these                |
- 14) What is hot molten rock called?
- |                  |            |
|------------------|------------|
| a) Lava          | b) Magma   |
| c) Igneous rocks | d) Volcano |

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant Engineering**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Assume additional suitable data, if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the different types of Load Curves? Explain any one in detail with a neat sketch. **05**  
 b) What is Tariff? Explain any one Tariff Method. **05**  
 c) Explain in short Straight Line Method of Depreciation with figure. **04**
- Q.3** a) Explain the role of NTPC and NPCIL in Power Development. **05**  
 b) Write a short note on the role of Power Grid Corporation in India (PGCIL). **04**  
 c) Explain the requirement of Compressed Air Storage Plants. **05**
- Q.4** a) What are the various factors considered during Selection of Site for Power Station? **05**  
 b) The load supplied by a power station is given below: **05**

| Time (Hr.) | 0 - 6 | 6 - 12 | 12 - 14 | 14 - 18 | 18 - 24 |
|------------|-------|--------|---------|---------|---------|
| Load (MW)  | 35    | 90     | 70      | 100     | 50      |

Draw the load curve & load duration curve. Determine plant capacity factor if plant capacity is 150 MW.

- c) Explain in short the role of the Private Sector in India for Power development. **04**

**Section – II**

- Q.5** a) Write a short note on Pyranometer. **05**  
 b) What is the role of energy audit in energy conservation? **04**  
 c) What is Tidal Energy? Explain Single Basin System Tidal Power Plant. **05**
- Q.6** a) What are the types of Energy Audit? Explain any one in detail. **05**  
 b) What are the Non-concentrating types Collectors? Explain Liquid Flat Plate Collector with a neat sketch. **05**  
 c) Explain with a neat sketch Closed OTEC Cycle Power Plant. **04**

- Q.7**
- |           |                                                                              |           |
|-----------|------------------------------------------------------------------------------|-----------|
| <b>a)</b> | Give a list and explain in short different energy audit instruments.         | <b>05</b> |
| <b>b)</b> | Give classification of wind mill and state its advantages and disadvantages. | <b>05</b> |
| <b>c)</b> | Define the following terms with neat sketch:                                 | <b>04</b> |
|           | 1) Latitude                                                                  |           |
|           | 2) Hour Angle                                                                |           |
|           | 3) Altitude                                                                  |           |
|           | 4) Solar Azimuth Angle                                                       |           |

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No.**

# Power Plant Engineering

Max. Marks: 70

3) Figures to the right indicate full marks

Marks: 14

14

- 1) A system has a connected load of 100 kW, the peak load of 80 kW. base load of 20 kW and an average load of 40 kW, will have a load factor of \_\_\_\_\_.  
a) 40%                                      b) 50%  
c) 60%                                      d) 80%
- 2) What does WECS stands for?  
a) Wind energy conversion system  
b) Wind engine control system  
c) Wind energy combined system  
d) Wind engine comparison system
- 3) Energy conservation act was formed in the year \_\_\_\_\_.  
a) 1998                                      b) 1999  
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- 4) The Function of solar collectors to convert \_\_\_\_\_.  
a) Solar energy into electricity  
b) Solar energy into radiations  
c) Solar energy into thermal energy  
d) none of these
- 5) What is hot molten rock called?  
a) Lava                                      b) Magma  
c) Igneous rocks                          d) Volcano
- 6) Which of the following power plant cannot be used as a base load plant?  
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c) Nuclear power plant                  d) Thermal power plant
- 7) Kinetic energy that results from the oscillation of water is called \_\_\_\_\_.  
a) Wave energy                            b) Tidal energy  
c) Ocean thermal energy                d) Hydro energy
- 8) Economiser is used to heat \_\_\_\_\_.  
a) Feed water                              b) Air  
c) Flue gases                              d) All of the above



- 9) Which Meter is used to measure the Beam Radiations?
  - a) Pyrheliometer
  - b) Sunshine Recorder
  - c) Anemometer
  - d) All of the above
- 10) A load curve is a plot of \_\_\_\_\_.
  - a) Load versus generation capacity
  - b) Load versus current
  - c) Load versus cost of power
  - d) Load versus time
- 11) An Inspection survey and analysis of energy flows for energy conservation in a building is called as \_\_\_\_\_.
  - a) Energy Management
  - b) Energy Audit
  - c) Energy Conservation
  - d) None of above
- 12) The solar constant value is \_\_\_\_\_.
  - a)  $1327 \text{ W/m}^2$
  - b)  $1366 \text{ W/m}^2$
  - c)  $1357 \text{ W/m}^2$
  - d)  $1377 \text{ W/m}^2$
- 13) Which of the following power plant have longest physical life?
  - a) Thermal power plant
  - b) Nuclear power plant
  - c) Hydroelectric power plant
  - d) Diesel power plant
- 14) In hydroelectric power, what is necessary for the production of power throughout the Year?
  - a) Dams filled with water
  - b) High amount of air
  - c) High intense sunlight
  - d) Nuclear power

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**MECHANICAL ENGINEERING**  
**Power Plant Engineering**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Solve any two questions from each section.  
 2) Use of calculator is allowed.  
 3) Figures to the right indicate full marks.  
 4) Assume additional suitable data, if necessary and mention it clearly.

**Section – I**

- Q.2** a) What are the different types of Load Curves? Explain any one in detail with a neat sketch. **05**  
 b) What is Tariff? Explain any one Tariff Method. **05**  
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- Q.3** a) Explain the role of NTPC and NPCIL in Power Development. **05**  
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 c) Explain the requirement of Compressed Air Storage Plants. **05**
- Q.4** a) What are the various factors considered during Selection of Site for Power Station? **05**  
 b) The load supplied by a power station is given below: **05**

| Time (Hr.) | 0 - 6 | 6 - 12 | 12 - 14 | 14 - 18 | 18 - 24 |
|------------|-------|--------|---------|---------|---------|
| Load (MW)  | 35    | 90     | 70      | 100     | 50      |

Draw the load curve & load duration curve. Determine plant capacity factor if plant capacity is 150 MW.

- c) Explain in short the role of the Private Sector in India for Power development. **04**

**Section – II**

- Q.5** a) Write a short note on Pyranometer. **05**  
 b) What is the role of energy audit in energy conservation? **04**  
 c) What is Tidal Energy? Explain Single Basin System Tidal Power Plant. **05**
- Q.6** a) What are the types of Energy Audit? Explain any one in detail. **05**  
 b) What are the Non-concentrating types Collectors? Explain Liquid Flat Plate Collector with a neat sketch. **05**  
 c) Explain with a neat sketch Closed OTEC Cycle Power Plant. **04**

- Q.7**
- |           |                                                                              |           |
|-----------|------------------------------------------------------------------------------|-----------|
| <b>a)</b> | Give a list and explain in short different energy audit instruments.         | <b>05</b> |
| <b>b)</b> | Give classification of wind mill and state its advantages and disadvantages. | <b>05</b> |
| <b>c)</b> | Define the following terms with neat sketch:                                 | <b>04</b> |
|           | 1) Latitude                                                                  |           |
|           | 2) Hour Angle                                                                |           |
|           | 3) Altitude                                                                  |           |
|           | 4) Solar Azimuth Angle                                                       |           |

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRONICS ENGINEERING**

**Electronic Circuit Analysis and Design**

Day & Date: Tuesday, 21-03-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The use of a capacitor filter in a rectifier circuit gives good performance when the load \_\_\_\_\_.
  - a) current is high
  - b) current is low
  - c) voltage is high
  - d) voltage is low
- 2) The main reason why a bleeder resistor is used in a dc power supply is that it \_\_\_\_\_.
  - a) keeps the supply ON
  - b) improves voltage regulation
  - c) improves filtering action
  - d) both b) and c)
- 3) Which rectifier requires four diodes?
  - a) half-wave voltage doubler
  - b) full-wave voltage doubler
  - c) full-wave bridge circuit
  - d) voltage tripler
- 4) In CE configuration the input V-I characteristics are drawn by taking \_\_\_\_\_.
  - a) VCE vs. IC for constant value of IE
  - b) VBE vs. IE for constant value of VCE
  - c) VBE vs. IB for constant value of IC
  - d) VBE vs. IB for constant value of VCB
- 5) A transistor connected in common base configuration has \_\_\_\_\_.
  - a) a high input resistance and low output resistance
  - b) a low input resistance and high output resistance
  - c) a low input resistance and low output resistance
  - d) a high input resistance and a high output resistance
- 6) One of the purpose of negative feedback is to \_\_\_\_\_.
  - a) increase noise
  - b) Decrease harmonic distortion
  - c) increase the voltage gain
  - d) decrease the bandwidth
- 7) JFET and BJT is \_\_\_\_\_.
  - a) Unipolar device and bipolar device
  - b) Voltage controlled device and Current controlled device
  - c) Current controlled device and Voltage controlled device
  - d) both a) & b)

- 8) For VVR application MOSFET is operated in \_\_\_\_\_ region.
- a) ohmic
  - b) saturation
  - c) pinch-off
  - d) both b) & c)
- 9) The basic purpose of filter is to \_\_\_\_\_.
- a) minimize variations in ac input signal
  - b) suppress harmonics in rectified output
  - c) remove ripples from the rectified output
  - d) stabilize dc output voltage
- 10) In a LC filter, the ripple factor, \_\_\_\_\_.
- a) Increases with the load current
  - b) increases with the load resistance
  - c) remains constant with the load current
  - d) has the lowest value
- 11) Early effect in BJT refers to \_\_\_\_\_.
- a) avalanche breakdown
  - b) thermal breakdown
  - c) base narrowing
  - d) Zener breakdown
- 12) If the output of an amplifier is 10 V and 100 mV from the output is fed back to the input, then feedback fraction is \_\_\_\_\_.
- a) 0.10
  - b) 1
  - c) 0.01
  - d) 0.15
- 13) If a three stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is \_\_\_\_\_.
- a) 600db
  - b) 24db
  - c) 14db
  - d) 31db
- 14) The dc current gain in common base configuration is given by \_\_\_\_\_.
- a)  $\alpha$
  - b)  $\beta$
  - c)  $\beta + 1$
  - d)  $\alpha + 1$

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Circuit Analysis and Design**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

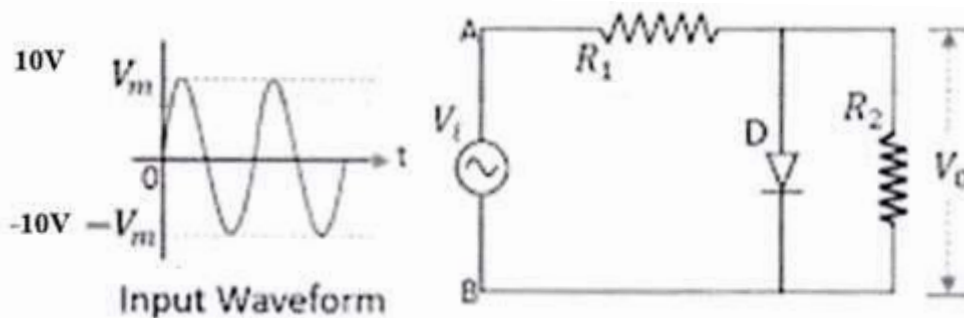
- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four)**

**16**

- Describe working of biased positive clamper with suitable example.
- Plot the output waveforms of clipper circuit supplied with sine input as shown. Name the type of clipper. Assume ideal diode in the circuit.



- Draw circuit diagram of LC filter with FWR and describe its functioning. What is critical inductor in LC filter?
- Explain procedure to plot dc load-line in case of CE BJT amplifier.
- Draw collector to base bias circuit and derive formula of its stability factor.

**Q.3 Answer the following question. (Any Two)**

**12**

- A dc voltage of 380 volt with a peak ripple voltage not more than 7 volts is required to supply across  $500\ \Omega$  load. If inductor filter is used for filtering purpose along with full-wave rectifier circuit, find value of inductance required and other circuit parameters.
- Analyze transistorized CE amplifier using h- parameters.
- What is bias stabilization in BJT? Describe different bias compensation techniques for BJT.

**Section – II**

- Q.4 Answer the following question. (Any Four) 16**
- a) Describe frequency response of single stage CE amplifier.
  - b) What are different types of couplings in multistage amplifiers? Describe any two briefly.
  - c) Draw block diagram for negative feedback in amplifier and derive generalized expression for gain with feedback. What is feedback factor?
  - d) List different biasing methods. Draw circuit diagram for fixed biasing and find stability factor.
  - e) Define the terms  $\alpha$  and  $\beta$  related to BJT. Write equation showing relation between  $\alpha$  and  $\beta$ . Find the value of the base current if common base current gain of BJT is 0.987 and emitter current is 10 mA.
- Q.5 Answer the following question. (Any Two) 12**
- a) Design an unregulated power supply using bridge rectifier and LC filter to provide output voltage of 10V dc, load current of 50mA and ripple factor equal to 6%. State specifications of different components.
  - b) An amplifier with 1K input resistance and 50 K output resistance has voltage gain of 40. The amplifier has now provided with 10 % negative feedback, calculate-
    - 1) Voltage gain with feedback
    - 2) Input resistance with feedback
    - 3) Output resistance with feedback
    - 4) loop-gain
  - c) Define different FET parameters. Draw and explain drain characteristics and transfer characteristics in case of FET.

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Set **Q**

**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Circuit Analysis and Design**

Day & Date: Tuesday, 21-03-2023  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

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  - b)  $\beta$
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  - d)  $\alpha + 1$



- 8) The use of a capacitor filter in a rectifier circuit gives good performance when the load \_\_\_\_\_.  
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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Circuit Analysis and Design**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

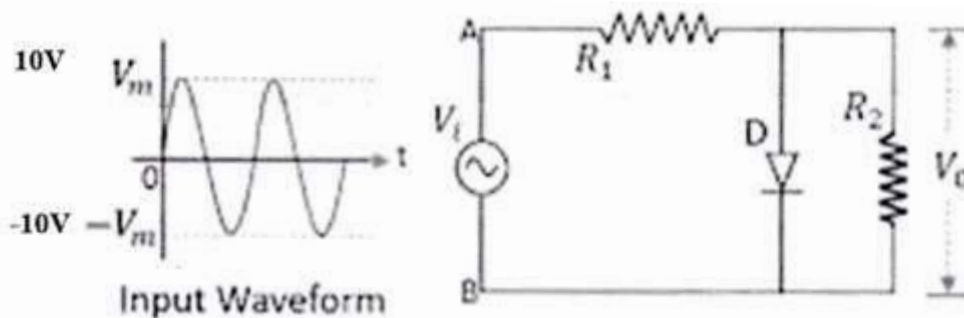
- Instructions:** 1) All questions are compulsory.  
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**Section – I**

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- Draw collector to base bias circuit and derive formula of its stability factor.

**Q.3 Answer the following question. (Any Two)**

**12**

- A dc voltage of 380 volt with a peak ripple voltage not more than 7 volts is required to supply across  $500\ \Omega$  load. If inductor filter is used for filtering purpose along with full-wave rectifier circuit, find value of inductance required and other circuit parameters.
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- What is bias stabilization in BJT? Describe different bias compensation techniques for BJT.

## Section – II

- Q.4 Answer the following question. (Any Four)** **16**
- a) Describe frequency response of single stage CE amplifier.
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  - c) Draw block diagram for negative feedback in amplifier and derive generalized expression for gain with feedback. What is feedback factor?
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- Q.5 Answer the following question. (Any Two)** **12**
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  - b) An amplifier with 1K input resistance and 50 K output resistance has voltage gain of 40. The amplifier has now provided with 10 % negative feedback, calculate-
    - 1) Voltage gain with feedback
    - 2) Input resistance with feedback
    - 3) Output resistance with feedback
    - 4) loop-gain
  - c) Define different FET parameters. Draw and explain drain characteristics and transfer characteristics in case of FET.

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Set **R**

**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Circuit Analysis and Design**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Early effect in BJT refers to \_\_\_\_\_.  
 a) avalanche breakdown                      b) thermal breakdown  
 c) base narrowing                                d) Zener breakdown
- 2) If the output of an amplifier is 10 V and 100 mV from the output is fed back to the input, then feedback fraction is \_\_\_\_\_.  
 a) 0.10                                                b) 1  
 c) 0.01                                                d) 0.15
- 3) If a three stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is \_\_\_\_\_.  
 a) 600db                                              b) 24db  
 c) 14db                                                d) 31db
- 4) The dc current gain in common base configuration is given by \_\_\_\_\_.  
 a)  $\alpha$                                                 b)  $\beta$   
 c)  $\beta + 1$                                               d)  $\alpha + 1$
- 5) The use of a capacitor filter in a rectifier circuit gives good performance when the load \_\_\_\_\_.  
 a) current is high                                      b) current is low  
 c) voltage is high                                      d) voltage is low
- 6) The main reason why a bleeder resistor is used in a dc power supply is that it \_\_\_\_\_.  
 a) keeps the supply ON                              b) improves voltage regulation  
 c) improves filtering action                        d) both b) and c)
- 7) Which rectifier requires four diodes?  
 a) half-wave voltage doubler                      b) full-wave voltage doubler  
 c) full-wave bridge circuit                        d) voltage tripler
- 8) In CE configuration the input V-I characteristics are drawn by taking \_\_\_\_\_.  
 a) VCE vs. IC for constant value of IE  
 b) VBE vs. IE for constant value of VCE  
 c) VBE vs. IB for constant value of IC  
 d) VBE vs. IB for constant value of VCB

- 9) A transistor connected in common base configuration has \_\_\_\_\_.  
a) a high input resistance and low output resistance  
b) a low input resistance and high output resistance  
c) a low input resistance and low output resistance  
d) a high input resistance and a high output resistance
- 10) One of the purpose of negative feedback is to \_\_\_\_\_.  
a) increase noise  
b) Decrease harmonic distortion  
c) increase the voltage gain  
d) decrease the bandwidth
- 11) JFET and BJT is \_\_\_\_\_.  
a) Unipolar device and bipolar device  
b) Voltage controlled device and Current controlled device  
c) Current controlled device and Voltage controlled device  
d) both a) & b)
- 12) For VVR application MOSFET is operated in \_\_\_\_\_ region.  
a) ohmic  
b) saturation  
c) pinch-off  
d) both b) & c)
- 13) The basic purpose of filter is to \_\_\_\_\_.  
a) minimize variations in ac input signal  
b) suppress harmonics in rectified output  
c) remove ripples from the rectified output  
d) stabilize dc output voltage
- 14) In a LC filter, the ripple factor, \_\_\_\_\_.  
a) Increases with the load current  
b) increases with the load resistance  
c) remains constant with the load current  
d) has the lowest value

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Set **R**

**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electronic Circuit Analysis and Design**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

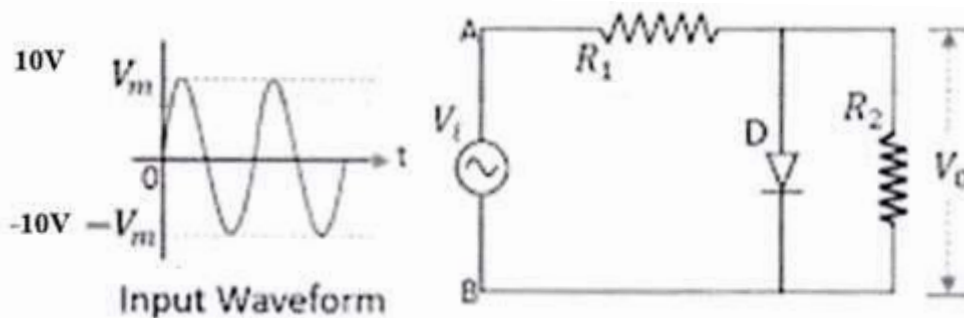
- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four)**

**16**

- Describe working of biased positive clamper with suitable example.
- Plot the output waveforms of clipper circuit supplied with sine input as shown. Name the type of clipper. Assume ideal diode in the circuit.



- Draw circuit diagram of LC filter with FWR and describe its functioning. What is critical inductor in LC filter?
- Explain procedure to plot dc load-line in case of CE BJT amplifier.
- Draw collector to base bias circuit and derive formula of its stability factor.

**Q.3 Answer the following question. (Any Two)**

**12**

- A dc voltage of 380 volt with a peak ripple voltage not more than 7 volts is required to supply across  $500\ \Omega$  load. If inductor filter is used for filtering purpose along with full-wave rectifier circuit, find value of inductance required and other circuit parameters.
- Analyze transistorized CE amplifier using h- parameters.
- What is bias stabilization in BJT? Describe different bias compensation techniques for BJT.

**Section – II**

- Q.4 Answer the following question. (Any Four) 16**
- a) Describe frequency response of single stage CE amplifier.
  - b) What are different types of couplings in multistage amplifiers? Describe any two briefly.
  - c) Draw block diagram for negative feedback in amplifier and derive generalized expression for gain with feedback. What is feedback factor?
  - d) List different biasing methods. Draw circuit diagram for fixed biasing and find stability factor.
  - e) Define the terms  $\alpha$  and  $\beta$  related to BJT. Write equation showing relation between  $\alpha$  and  $\beta$ . Find the value of the base current if common base current gain of BJT is 0.987 and emitter current is 10 mA.
- Q.5 Answer the following question. (Any Two) 12**
- a) Design an unregulated power supply using bridge rectifier and LC filter to provide output voltage of 10V dc, load current of 50mA and ripple factor equal to 6%. State specifications of different components.
  - b) An amplifier with 1K input resistance and 50 K output resistance has voltage gain of 40. The amplifier has now provided with 10 % negative feedback, calculate-
    - 1) Voltage gain with feedback
    - 2) Input resistance with feedback
    - 3) Output resistance with feedback
    - 4) loop-gain
  - c) Define different FET parameters. Draw and explain drain characteristics and transfer characteristics in case of FET.

**Seat  
No.**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) One of the purpose of negative feedback is to \_\_\_\_\_.  
a) increase noise                      b) Decrease harmonic distortion  
c) increase the voltage gain        d) decrease the bandwidth
- 2) JFET and BJT is \_\_\_\_\_.  
a) Unipolar device and bipolar device  
b) Voltage controlled device and Current controlled device  
c) Current controlled device and Voltage controlled device  
d) both a) & b)
- 3) For VVR application MOSFET is operated in \_\_\_\_\_ region.  
a) ohmic                                  b) saturation  
c) pinch-off                             d) both b) & c)
- 4) The basic purpose of filter is to \_\_\_\_\_.  
a) minimize variations in ac input signal  
b) suppress harmonics in rectified output  
c) remove ripples from the rectified output  
d) stabilize dc output voltage
- 5) In a LC filter, the ripple factor, \_\_\_\_\_.  
a) Increases with the load current  
b) increases with the load resistance  
c) remains constant with the load current  
d) has the lowest value
- 6) Early effect in BJT refers to \_\_\_\_\_.  
a) avalanche breakdown            b) thermal breakdown  
c) base narrowing                    d) Zener breakdown
- 7) If the output of an amplifier is 10 V and 100 mV from the output is fed back to the input, then feedback fraction is \_\_\_\_\_.  
a) 0.10                                  b) 1  
c) 0.01                                  d) 0.15



- 8) If a three stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is \_\_\_\_\_.  
a) 600db  
b) 24db  
c) 14db  
d) 31db
- 9) The dc current gain in common base configuration is given by \_\_\_\_\_.  
a)  $\alpha$   
b)  $\beta$   
c)  $\beta + 1$   
d)  $\alpha + 1$
- 10) The use of a capacitor filter in a rectifier circuit gives good performance when the load \_\_\_\_\_.  
a) current is high  
b) current is low  
c) voltage is high  
d) voltage is low
- 11) The main reason why a bleeder resistor is used in a dc power supply is that it \_\_\_\_\_.  
a) keeps the supply ON  
b) improves voltage regulation  
c) improves filtering action  
d) both b) and c)
- 12) Which rectifier requires four diodes?  
a) half-wave voltage doubler  
b) full-wave voltage doubler  
c) full-wave bridge circuit  
d) voltage tripler
- 13) In CE configuration the input V-I characteristics are drawn by taking \_\_\_\_\_.  
a) VCE vs. IC for constant value of IE  
b) VBE vs. IE for constant value of VCE  
c) VBE vs. IB for constant value of IC  
d) VBE vs. IB for constant value of VCB
- 14) A transistor connected in common base configuration has \_\_\_\_\_.  
a) a high input resistance and low output resistance  
b) a low input resistance and high output resistance  
c) a low input resistance and low output resistance  
d) a high input resistance and a high output resistance

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Set **S**

S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022

**ELECTRONICS ENGINEERING****Electronic Circuit Analysis and Design**

Day &amp; Date: Tuesday, 21-03-2023

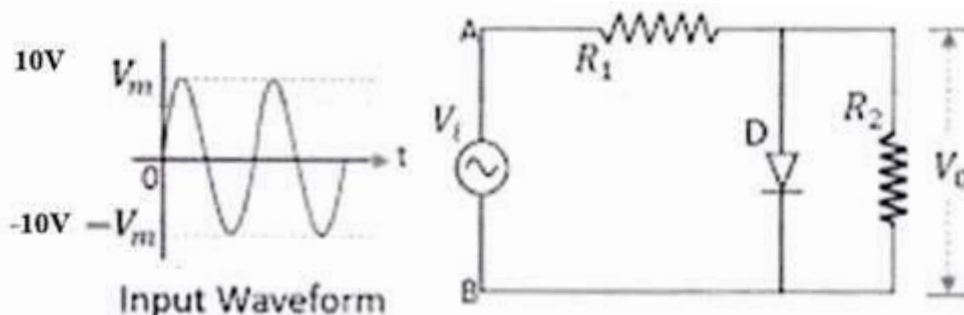
Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I****Q.2 Answer the following question. (Any Four)****16**

- Describe working of biased positive clamper with suitable example.
- Plot the output waveforms of clipper circuit supplied with sine input as shown. Name the type of clipper. Assume ideal diode in the circuit.



- Draw circuit diagram of LC filter with FWR and describe its functioning. What is critical inductor in LC filter?
- Explain procedure to plot dc load-line in case of CE BJT amplifier.
- Draw collector to base bias circuit and derive formula of its stability factor.

**Q.3 Answer the following question. (Any Two)****12**

- A dc voltage of 380 volt with a peak ripple voltage not more than 7 volts is required to supply across  $500\ \Omega$  load. If inductor filter is used for filtering purpose along with full-wave rectifier circuit, find value of inductance required and other circuit parameters.
- Analyze transistorized CE amplifier using h- parameters.
- What is bias stabilization in BJT? Describe different bias compensation techniques for BJT.

**Section – II****Q.4 Answer the following question. (Any Four)****16**

- a) Describe frequency response of single stage CE amplifier.
- b) What are different types of couplings in multistage amplifiers? Describe any two briefly.
- c) Draw block diagram for negative feedback in amplifier and derive generalized expression for gain with feedback. What is feedback factor?
- d) List different biasing methods. Draw circuit diagram for fixed biasing and find stability factor.
- e) Define the terms  $\alpha$  and  $\beta$  related to BJT. Write equation showing relation between  $\alpha$  and  $\beta$ . Find the value of the base current if common base current gain of BJT is 0.987 and emitter current is 10 mA.

**Q.5 Answer the following question. (Any Two)****12**

- a) Design an unregulated power supply using bridge rectifier and LC filter to provide output voltage of 10V dc, load current of 50mA and ripple factor equal to 6%. State specifications of different components.
- b) An amplifier with 1K input resistance and 50 K output resistance has voltage gain of 40. The amplifier has now provided with 10 % negative feedback, calculate-
  - 1) Voltage gain with feedback
  - 2) Input resistance with feedback
  - 3) Output resistance with feedback
  - 4) loop-gain
- c) Define different FET parameters. Draw and explain drain characteristics and transfer characteristics in case of FET.

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Set

P

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Example of a two port network is
  - a) transformer
  - b) transmission line
  - c) bridge circuit and transistor circuit
  - d) all of the above
- 2) Maximum power is transferred when the load impedance is equal to
  - a) Source impedance
  - b) Zero
  - c) Half of Source Impedance
  - d) none
- 3) If  $Z_{11}=2$  ohm,  $Z_{12}=1$  ohm and  $Z_{21}=1$  ohm and  $Z_{22}=3$  ohm, what is the determinant of matrix?
  - a) 1
  - b)  $1/5$
  - c) 5
  - d) 2
- 4) When two port networks are connected in series the resultant
  - a) Z parameters are a sum of individual parameters
  - b) Y parameters are a sum of individual parameters
  - c) h parameters are a sum of individual parameters
  - d) ABCD parameters are a sum of individual parameters
- 5) If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_\_.
  - a) C
  - b)  $\omega RC$
  - c)  $\omega C$
  - d)  $1/\omega RC$
- 6) In the parallel RLC circuit the impedance at resonance is
  - a) Maximum
  - b) Minimum
  - c) Zero
  - d) Infinity
- 7) Superposition theorem is valid for \_\_\_\_\_.
  - a) Linear systems
  - b) Non-linear systems
  - c) Both linear and non-linear systems
  - d) Neither linear nor non-linear systems

- 8) The system is said to be stable if and only if
- All the poles lie on right half of the s-plane
  - Some of the poles lie on right half of the s-plane
  - All the poles lie on the left half of the s-plane
  - None
- 9) The system is said to be unstable if \_\_\_\_\_.
- all the poles lie on right half of s plane
  - all the poles lie on left half of s plane
  - all poles does not lie on right half of s plane
  - both a and b
- 10) An ideal filter should have
- zero attenuation in pass band
  - infinite attenuation in pass band
  - zero attenuation in attenuation band
  - all of the above
- 11) The function is said to be having simple poles and zeros only if
- The poles are not repeated
  - The zeros are not repeated
  - The poles and zeros are not repeated
  - none of the above
- 12) A Low pass filter is one which
- Passes all low frequencies
  - Attenuates all high frequencies
  - Passes all low frequencies up to cut-off frequencies and attenuates all other frequencies
  - None
- 13) Transient behavior occurs in any circuit when
- there is sudden change in applied voltage
  - the voltage source is suddenly shorted
  - the circuit is connected or disconnected from supply
  - all of the above
- 14) When a series RC circuit is connected to a constant voltage at  $t=0$ , the current passing through the circuit is at  $t=0^+$  is
- |                  |                         |
|------------------|-------------------------|
| a) Infinite      | b) zero                 |
| c) $\frac{V}{R}$ | d) $\frac{V}{\omega C}$ |

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

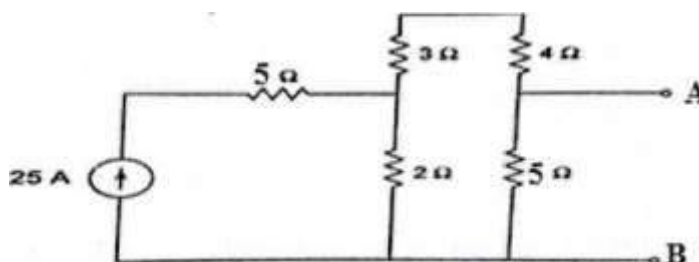
- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four (4x4)**

16

- State and prove Maximum power transfer theorem.
- A Series RLC Circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100V. The total impedance of the circuit is  $20\Omega$ . Find the circuit constants R, L & C.
- Derive an expression of resonant frequency for a parallel resonance circuit.
- Determine Norton's equivalent circuit for above circuit.

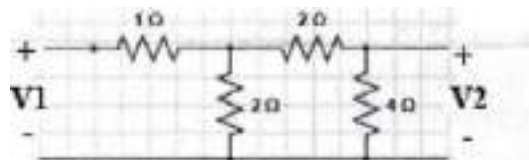


- Express Z parameters in terms of Y parameter.

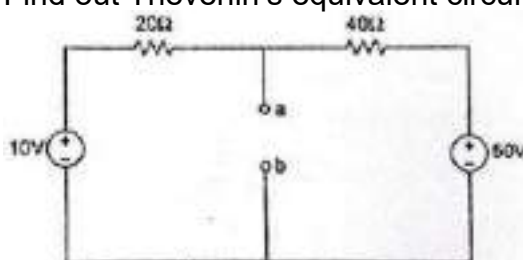
**Q.3 Attempt any two (2x6)**

12

- Prove that bandwidth of series RLC circuit is  $BW = \frac{R}{2\pi L}$  and  $Q = \frac{fr}{BW}$
- Find the Z parameters of the above two port network.



- Find out Thevenin's equivalent circuit for following circuits.

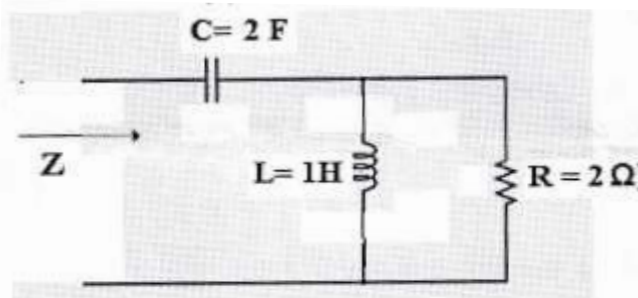


## Section - II

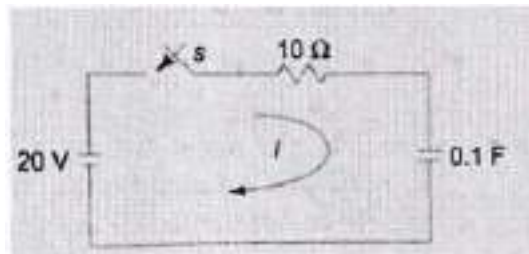
## Q.4 Attempt any four (4x4)

16

- a) Design a T pad attenuator to give an attenuation of 50dB & to work in line of  $600\Omega$  impedance.
- b) Prove that cut off frequency for constant K low pass filter is  $F_c = \frac{1}{\pi \sqrt{LC}}$
- c) Check stability of following polynomial by applying Routh criteria  
 $Q(S) = S^3 + 2S^2 + 8S + 10$
- d) Find  $Z(S)$  for following network



- e) A series RC circuit consists of resistor of  $10\Omega$  and capacitor of  $0.1F$  as shown in figure. A constant voltage of  $20V$  is applied to the circuit at  $t=0$ . Obtain the current equation. Determine the voltage across the resistor and the capacitor.



## Q.5 Attempt any two (2x6)

12

- a) Draw the pole-zero plot for the given network function and hence obtain  $V(t)$ .  $V(s) = \frac{4s(s+2)}{(s+1)(s+3)}$
- b) Derive an expression of current,  $V_R$  &  $V_L$  for dc response of series RL circuit.
- c) Design a HPF (T &  $\pi$  section) having  $f_c = 1\text{KHz}$  and design impedance  $R_o = 600\Omega$

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The system is said to be stable if and only if
  - a) All the poles lie on right half of the s-plane
  - b) Some of the poles lie on right half of the s-plane
  - c) All the poles lie on the left half of the s-plane
  - d) None
- 2) The system is said to be unstable if \_\_\_\_\_.
  - a) all the poles lie on right half of s plane
  - b) all the poles lie on left half of s plane
  - c) all poles does not lie on right half of s plane
  - d) both a and b
- 3) An ideal filter should have
  - a) zero attenuation in pass band
  - b) infinite attenuation in pass band
  - c) zero attenuation in attenuation band
  - d) all of the above
- 4) The function is said to be having simple poles and zeros only if
  - a) The poles are not repeated
  - b) The zeros are not repeated
  - c) The poles and zeros are not repeated
  - d) none of the above
- 5) A Low pass filter is one which
  - a) Passes all low frequencies
  - b) Attenuates all high frequencies
  - c) Passes all low frequencies up to cut-off frequencies and attenuates all other frequencies
  - d) None



- 6) Transient behavior occurs in any circuit when
- there is sudden change in applied voltage
  - the voltage source is suddenly shorted
  - the circuit is connected or disconnected from supply
  - all of the above
- 7) When a series RC circuit is connected to a constant voltage at  $t=0$ , the current passing through the circuit is at  $t=0^+$  is
- Infinite
  - zero
  - $\frac{V}{R}$
  - $\frac{V}{\omega C}$
- 8) Example of a two port network is
- transformer
  - transmission line
  - bridge circuit and transistor circuit
  - all of the above
- 9) Maximum power is transferred when the load impedance is equal to
- Source impedance
  - Zero
  - Half of Source Impedance
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- 10) If  $Z_{11}=2$  ohm,  $Z_{12}=1$  ohm and  $Z_{21}=1$  ohm and  $Z_{22}=3$  ohm, what is the determinant of matrix?
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  - $1/5$
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  - $\omega RC$
  - $\omega C$
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- 13) In the parallel RLC circuit the impedance at resonance is
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  - Minimum
  - Zero
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- 14) Superposition theorem is valid for \_\_\_\_.
- Linear systems
  - Non-linear systems
  - Both linear and non-linear systems
  - Neither linear nor non-linear systems

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

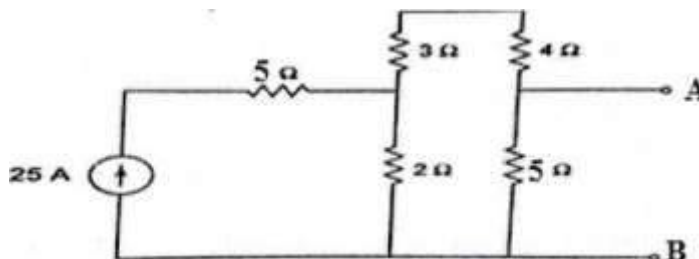
- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four (4x4)**

**16**

- State and prove Maximum power transfer theorem.
- A Series RLC Circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100V. The total impedance of the circuit is  $20\Omega$ . Find the circuit constants R, L & C.
- Derive an expression of resonant frequency for a parallel resonance circuit.
- Determine Norton's equivalent circuit for above circuit.

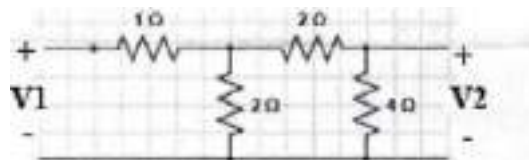


- Express Z parameters in terms of Y parameter.

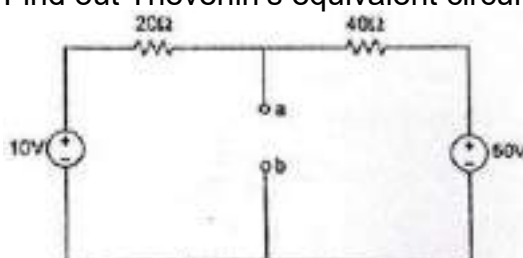
**Q.3 Attempt any two (2x6)**

**12**

- Prove that bandwidth of series RLC circuit is  $BW = \frac{R}{2\pi L}$  and  $Q = \frac{fr}{BW}$
- Find the Z parameters of the above two port network.



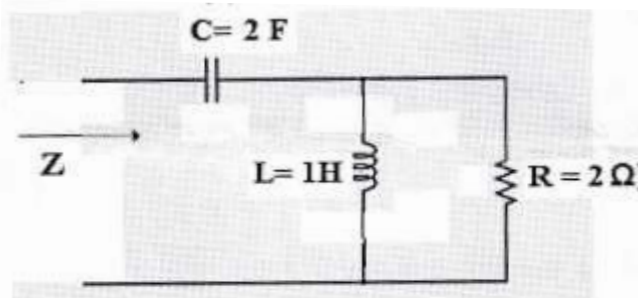
- Find out Thevenin's equivalent circuit for following circuits.



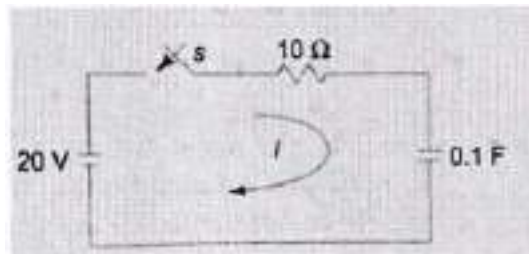
## Section - II

**Q.4 Attempt any four (4x4)****16**

- a) Design a T pad attenuator to give an attenuation of 50dB & to work in line of  $600\Omega$  impedance.
- b) Prove that cut off frequency for constant K low pass filter is  $F_c = \frac{1}{\pi \sqrt{LC}}$
- c) Check stability of following polynomial by applying Routh criteria  
 $Q(S) = S^3 + 2S^2 + 8S + 10$
- d) Find  $Z(S)$  for following network



- e) A series RC circuit consists of resistor of  $10\Omega$  and capacitor of  $0.1F$  as shown in figure. A constant voltage of  $20V$  is applied to the circuit at  $t=0$ . Obtain the current equation. Determine the voltage across the resistor and the capacitor.

**Q.5 Attempt any two (2x6)****12**

- a) Draw the pole-zero plot for the given network function and hence obtain  $V(t)$ .  $V(s) = \frac{4s(s+2)}{(s+1)(s+3)}$
- b) Derive an expression of current,  $V_R$  &  $V_L$  for dc response of series RL circuit.
- c) Design a HPF (T &  $\pi$  section) having  $f_c = 1\text{KHz}$  and design impedance  $R_o = 600\Omega$

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The function is said to be having simple poles and zeros only if
  - a) The poles are not repeated
  - b) The zeros are not repeated
  - c) The poles and zeros are not repeated
  - d) none of the above
- 2) A Low pass filter is one which
  - a) Passes all low frequencies
  - b) Attenuates all high frequencies
  - c) Passes all low frequencies up to cut-off frequencies and attenuates all other frequencies
  - d) None
- 3) Transient behavior occurs in any circuit when
  - a) there is sudden change in applied voltage
  - b) the voltage source is suddenly shorted
  - c) the circuit is connected or disconnected from supply
  - d) all of the above
- 4) When a series RC circuit is connected to a constant voltage at  $t=0$ , the current passing through the circuit is at  $t=0^+$  is
 

|                  |                         |
|------------------|-------------------------|
| a) Infinite      | b) zero                 |
| c) $\frac{V}{R}$ | d) $\frac{V}{\omega C}$ |
- 5) Example of a two port network is
  - a) transformer
  - b) transmission line
  - c) bridge circuit and transistor circuit
  - d) all of the above
- 6) Maximum power is transferred when the load impedance is equal to
 

|                             |         |
|-----------------------------|---------|
| a) Source impedance         | b) Zero |
| c) Half of Source Impedance | d) none |



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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

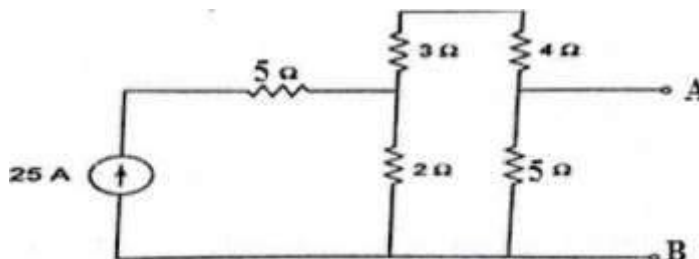
- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four (4x4)**

**16**

- State and prove Maximum power transfer theorem.
- A Series RLC Circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100V. The total impedance of the circuit is  $20\Omega$ . Find the circuit constants R, L & C.
- Derive an expression of resonant frequency for a parallel resonance circuit.
- Determine Norton's equivalent circuit for above circuit.

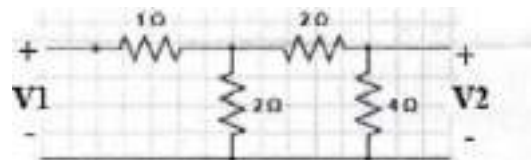


- Express Z parameters in terms of Y parameter.

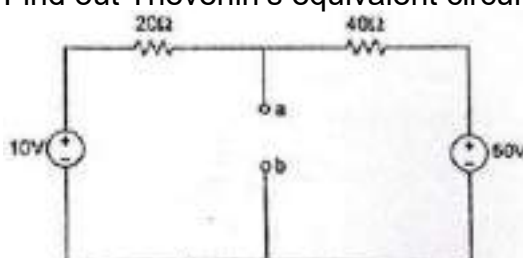
**Q.3 Attempt any two (2x6)**

**12**

- Prove that bandwidth of series RLC circuit is  $BW = \frac{R}{2\pi L}$  and  $Q = \frac{fr}{BW}$
- Find the Z parameters of the above two port network.



- Find out Thevenin's equivalent circuit for following circuits.

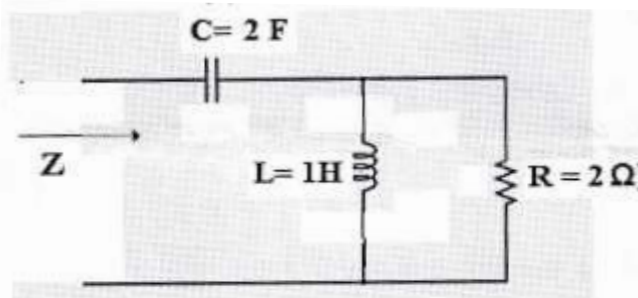


## Section - II

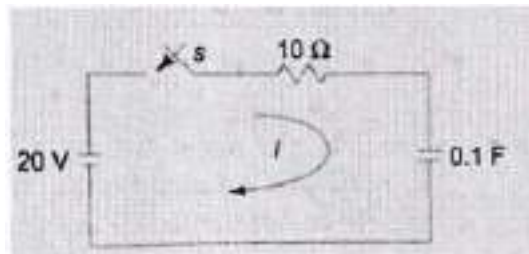
## Q.4 Attempt any four (4x4)

16

- a) Design a T pad attenuator to give an attenuation of 50dB & to work in line of  $600\Omega$  impedance.
- b) Prove that cut off frequency for constant K low pass filter is  $F_c = \frac{1}{\pi \sqrt{LC}}$
- c) Check stability of following polynomial by applying Routh criteria  
 $Q(S) = S^3 + 2S^2 + 8S + 10$
- d) Find  $Z(S)$  for following network



- e) A series RC circuit consists of resistor of  $10\Omega$  and capacitor of  $0.1F$  as shown in figure. A constant voltage of  $20V$  is applied to the circuit at  $t=0$ . Obtain the current equation. Determine the voltage across the resistor and the capacitor.



## Q.5 Attempt any two (2x6)

12

- a) Draw the pole-zero plot for the given network function and hence obtain  $V(t)$ .  $V(s) = \frac{4s(s+2)}{(s+1)(s+3)}$
- b) Derive an expression of current,  $V_R$  &  $V_L$  for dc response of series RL circuit.
- c) Design a HPF (T &  $\pi$  section) having  $f_c = 1\text{KHz}$  and design impedance  $R_o = 600\Omega$

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In the parallel RLC circuit the impedance at resonance is
  - a) Maximum
  - b) Minimum
  - c) Zero
  - d) Infinity
- 2) Superposition theorem is valid for \_\_\_\_\_.
  - a) Linear systems
  - b) Non-linear systems
  - c) Both linear and non-linear systems
  - d) Neither linear nor non-linear systems
- 3) The system is said to be stable if and only if
  - a) All the poles lie on right half of the s-plane
  - b) Some of the poles lie on right half of the s-plane
  - c) All the poles lie on the left half of the s-plane
  - d) None
- 4) The system is said to be unstable if \_\_\_\_\_.
  - a) all the poles lie on right half of s plane
  - b) all the poles lie on left half of s plane
  - c) all poles does not lie on right half of s plane
  - d) both a and b
- 5) An ideal filter should have
  - a) zero attenuation in pass band
  - b) infinite attenuation in pass band
  - c) zero attenuation in attenuation band
  - d) all of the above
- 6) The function is said to be having simple poles and zeros only if
  - a) The poles are not repeated
  - b) The zeros are not repeated
  - c) The poles and zeros are not repeated
  - d) none of the above



- 7) A Low pass filter is one which
- Passes all low frequencies
  - Attenuates all high frequencies
  - Passes all low frequencies up to cut-off frequencies and attenuates all other frequencies
  - None
- 8) Transient behavior occurs in any circuit when
- there is sudden change in applied voltage
  - the voltage source is suddenly shorted
  - the circuit is connected or disconnected from supply
  - all of the above
- 9) When a series RC circuit is connected to a constant voltage at  $t=0$ , the current passing through the circuit is at  $t=0^+$  is
- Infinite
  - zero
  - $\frac{V}{R}$
  - $\frac{V}{\omega C}$
- 10) Example of a two port network is
- transformer
  - transmission line
  - bridge circuit and transistor circuit
  - all of the above
- 11) Maximum power is transferred when the load impedance is equal to
- Source impedance
  - Zero
  - Half of Source Impedance
  - none
- 12) If  $Z_{11}=2$  ohm,  $Z_{12}=1$  ohm and  $Z_{21}=1$  ohm and  $Z_{22}=3$  ohm, what is the determinant of matrix?
- 1
  - 1/5
  - 5
  - 2
- 13) When two port networks are connected in series the resultant
- Z parameters are a sum of individual parameters
  - Y parameters are a sum of individual parameters
  - h parameters are a sum of individual parameters
  - ABCD parameters are a sum of individual parameters
- 14) If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_.
- C
  - $\omega RC$
  - $\omega C$
  - $1/\omega RC$

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

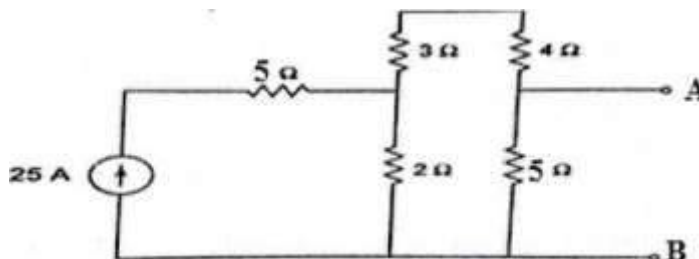
- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four (4x4)**

16

- State and prove Maximum power transfer theorem.
- A Series RLC Circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100V. The total impedance of the circuit is  $20\Omega$ . Find the circuit constants R, L & C.
- Derive an expression of resonant frequency for a parallel resonance circuit.
- Determine Norton's equivalent circuit for above circuit.

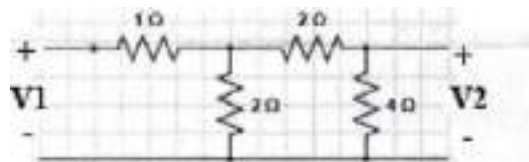


- Express Z parameters in terms of Y parameter.

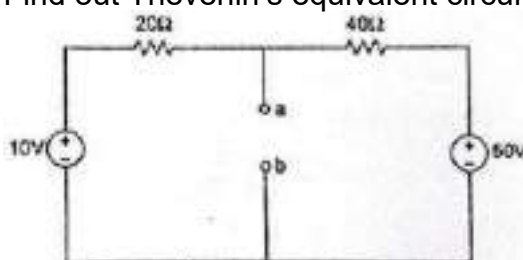
**Q.3 Attempt any two (2x6)**

12

- Prove that bandwidth of series RLC circuit is  $BW = \frac{R}{2\pi L}$  and  $Q = \frac{fr}{BW}$
- Find the Z parameters of the above two port network.



- Find out Thevenin's equivalent circuit for following circuits.

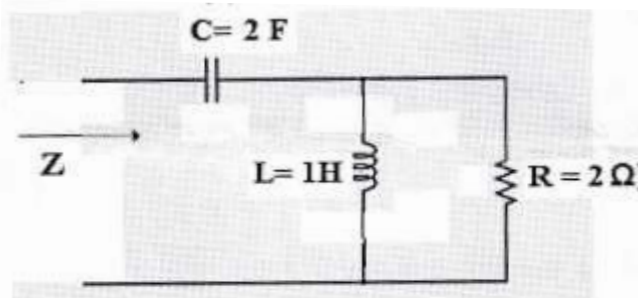


## Section - II

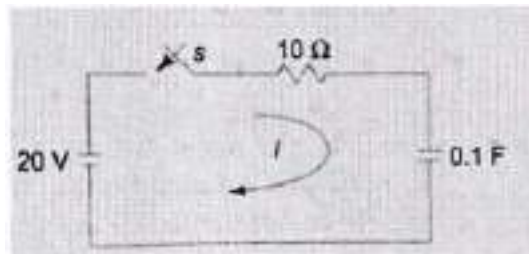
## Q.4 Attempt any four (4x4)

16

- a) Design a T pad attenuator to give an attenuation of 50dB & to work in line of  $600\Omega$  impedance.
- b) Prove that cut off frequency for constant K low pass filter is  $F_c = \frac{1}{\pi \sqrt{LC}}$
- c) Check stability of following polynomial by applying Routh criteria  
 $Q(S) = S^3 + 2S^2 + 8S + 10$
- d) Find  $Z(S)$  for following network



- e) A series RC circuit consists of resistor of  $10\Omega$  and capacitor of  $0.1F$  as shown in figure. A constant voltage of  $20V$  is applied to the circuit at  $t=0$ . Obtain the current equation. Determine the voltage across the resistor and the capacitor.



## Q.5 Attempt any two (2x6)

12

- a) Draw the pole-zero plot for the given network function and hence obtain  $V(t)$ .  $V(s) = \frac{4s(s+2)}{(s+1)(s+3)}$
- b) Derive an expression of current,  $V_R$  &  $V_L$  for dc response of series RL circuit.
- c) Design a HPF (T &  $\pi$  section) having  $f_c = 1\text{KHz}$  and design impedance  $R_o = 600\Omega$

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electrical Machines**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if required.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) D.C. generator works on the principle of \_\_\_\_\_.  
 a) Lenz's law  
 b) Ohm's law  
 c) Faraday's law of electromagnetic induction  
 d) None of the above
- 2) In a D.C. generator the critical resistance can be increased by \_\_\_\_\_.  
 a) Increasing its field resistance      b) Decreasing its field resistance  
 c) Increasing its speed                      d) Decreasing its speed
- 3) In a D.C. generator the critical resistance refers to the resistance of \_\_\_\_\_.  
 a) Brushes                                      b) Field  
 c) Armature                                      d) Load
- 4) Which of the following law/rule can be used to determine the direction of rotation of D.C. motor?  
 a) Lenz's law                                      b) Faraday's law  
 c) Coulomb's law                                      d) Fleming's left-hand rule
- 5) One D.C. motor drives another D.C. motor. The second D.C. motor when excited and driven  
 a) Does not run as a generator  
 b) Also runs as a motor comes to stop after sometime  
 c) Runs as a generator  
 d) None of these
- 6) In a low power factor wattmeter the compensating coil is connected  
 a) In series with current coil  
 b) In parallel with current coil  
 c) In series with pressure coil  
 d) In parallel with pressure coil
- 7) In a 3-phase power measurement by two wattmeter method, both the wattmeters had identical readings. The power factor of the load was  
 a) Unity                                              b) 0.8 lagging  
 c) 0.8 leading                                      d) Zero



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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electrical Machines**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What is working principle of DC generator? Derive the EMF equation of a DC generator.
- b) A dc generator generates an EMF of 450V and has 1000 armature conductors, flux per pole of 0.012 wb, speed of 1500 rpm and the armature winding has 4 parallel paths, find the number of poles.
- c) A dc shunt motor takes a load current of 40A from a 230V dc power supply the armature and field resistance are 0.25  $\Omega$  and 220  $\Omega$  respectively. Find the armature torque when the motor runs at 960rpm.
- d) Derive the torque equation of a DC motor.
- e) Discuss the power factor and causes of low power factor.

**Q.3 Solve any two:** **12**

- a) An 8pole d.c. shunt generator with 778 wave connected armature conductors and running at 500 rpm supplies load of 12.5  $\Omega$  resistance at terminal voltage of 50V. The armature resistance is 0.24  $\Omega$  and field resistance is 250  $\Omega$ . Find armature current, induced emf and flux per pole.
- b) Explain various schemes of speed control of dc motor.
- c) Explain two wattmeter method for three phase power measurement.

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain working of capacitor start single phase induction motor
- b) A 3ph delta/star connected 11000/440V, 50Hz transformer takes line current of 5 amp, when secondary load of 0.8 Lagging power factor is connected. Determine each coil current and output of transformer.
- c) On which factor the speed of three phase induction motor depends? And how to control the speed of three phase induction motor?
- d) A 4 pole, 50 (Hz) three phase induction motor running with speed 1440 (rpm). Find synchronous speed, slip speed, slip for this condition.
- e) Draw neat diagram of star delta starter and explain its operation.

**Q.5 Solve any Two.**

- a)** Draw and explain star- delta three phase transformer connections.  
Compare star- delta and delta- star three phase transformer connection.
- b)** Discuss about the working, types, characteristics and applications of universal motor.
- c)** A 3-phase induction motor is wound for 4 pole & is supplied from 50HZ system calculate
  - a) The synchronous speed
  - b) The speed of motor when the slip is 4%
  - c) The rotor current frequency when the motor runs at 600rpm.

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Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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Marks: 14

14

- Page 5 of 16



- 8) D.C. generator works on the principle of \_\_\_\_\_.  
a) Lenz's law  
b) Ohm's law  
c) Faraday's law of electromagnetic induction  
d) None of the above
- 9) In a D.C. generator the critical resistance can be increased by \_\_\_\_\_.  
a) Increasing its field resistance      b) Decreasing its field resistance  
c) Increasing its speed                      d) Decreasing its speed
- 10) In a D.C. generator the critical resistance refers to the resistance of \_\_\_\_\_.  
a) Brushes                                      b) Field  
c) Armature                                    d) Load
- 11) Which of the following law/rule can be used to determine the direction of rotation of D.C. motor?  
a) Lenz's law                                      b) Faraday's law  
c) Coulomb's law                                d) Fleming's left-hand rule
- 12) One D.C. motor drives another D.C. motor. The second D.C. motor when excited and driven  
a) Does not run as a generator  
b) Also runs as a motor comes to stop after sometime  
c) Runs as a generator  
d) None of these
- 13) In a low power factor wattmeter the compensating coil is connected  
a) In series with current coil  
b) In parallel with current coil  
c) In series with pressure coil  
d) In parallel with pressure coil
- 14) In a 3-phase power measurement by two wattmeter method, both the wattmeters had identical readings. The power factor of the load was  
a) Unity                                              b) 0.8 lagging  
c) 0.8 leading                                      d) Zero

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**Set Q**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electrical Machines**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What is working principle of DC generator? Derive the EMF equation of a DC generator.
- b) A dc generator generates an EMF of 450V and has 1000 armature conductors, flux per pole of 0.012 wb, speed of 1500 rpm and the armature winding has 4 parallel paths, find the number of poles.
- c) A dc shunt motor takes a load current of 40A from a 230V dc power supply the armature and field resistance are 0.25  $\Omega$  and 220  $\Omega$  respectively. Find the armature torque when the motor runs at 960rpm.
- d) Derive the torque equation of a DC motor.
- e) Discuss the power factor and causes of low power factor.

**Q.3 Solve any two:** **12**

- a) An 8pole d.c. shunt generator with 778 wave connected armature conductors and running at 500 rpm supplies load of 12.5  $\Omega$  resistance at terminal voltage of 50V. The armature resistance is 0.24  $\Omega$  and field resistance is 250  $\Omega$ . Find armature current, induced emf and flux per pole.
- b) Explain various schemes of speed control of dc motor.
- c) Explain two wattmeter method for three phase power measurement.

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain working of capacitor start single phase induction motor
- b) A 3ph delta/star connected 11000/440V, 50Hz transformer takes line current of 5 amp, when secondary load of 0.8 Lagging power factor is connected. Determine each coil current and output of transformer.
- c) On which factor the speed of three phase induction motor depends? And how to control the speed of three phase induction motor?
- d) A 4 pole, 50 (Hz) three phase induction motor running with speed 1440 (rpm). Find synchronous speed, slip speed, slip for this condition.
- e) Draw neat diagram of star delta starter and explain its operation.

**Q.5 Solve any Two.**

- a)** Draw and explain star- delta three phase transformer connections.  
Compare star- delta and delta- star three phase transformer connection.
- b)** Discuss about the working, types, characteristics and applications of universal motor.
- c)** A 3-phase induction motor is wound for 4 pole & is supplied from 50HZ system calculate
  - a) The synchronous speed
  - b) The speed of motor when the slip is 4%
  - c) The rotor current frequency when the motor runs at 600rpm.

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Set **R**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electrical Machines**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.  
 4) Assume suitable data if required.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In a split-phase motor, the running winding should have \_\_\_\_\_.  
 a) High resistance and low inductance  
 b) High resistance and High inductance  
 c) Low resistance and high inductance  
 d) Low resistance and low inductance
- 2) If the capacitor of a single-phase motor is short-circuited  
 a) The motor will not start  
 b) The motor will run in the same direction at a reduced speed  
 c) The motor will run in the reverse direction  
 d) None of the above
- 3) The transformer which is more feasible to use in the distribution ends should be \_\_\_\_\_.  
 a) star-delta  
 b) delta-star  
 c) scott  
 d) delta-delta
- 4) The open delta connection (V-V) is frequently used for \_\_\_\_\_.  
 a) two auto-transformers  
 b) three auto-transformers  
 c) four auto-transformers  
 d) five two auto-transformers
- 5) D.C. generator works on the principle of \_\_\_\_\_.  
 a) Lenz's law  
 b) Ohm's law  
 c) Faraday's law of electromagnetic induction  
 d) None of the above
- 6) In a D.C. generator the critical resistance can be increased by \_\_\_\_\_.  
 a) Increasing its field resistance  
 b) Decreasing its field resistance  
 c) Increasing its speed  
 d) Decreasing its speed
- 7) In a D.C. generator the critical resistance refers to the resistance of \_\_\_\_\_.  
 a) Brushes  
 b) Field  
 c) Armature  
 d) Load

- 8) Which of the following law/rule can be used to determine the direction of rotation of D.C. motor?
- a) Lenz's law
  - b) Faraday's law
  - c) Coulomb's law
  - d) Fleming's left-hand rule
- 9) One D.C. motor drives another D.C. motor. The second D.C. motor when excited and driven
- a) Does not run as a generator
  - b) Also runs as a motor comes to stop after sometime
  - c) Runs as a generator
  - d) None of these
- 10) In a low power factor wattmeter the compensating coil is connected
- a) In series with current coil
  - b) In parallel with current coil
  - c) In series with pressure coil
  - d) In parallel with pressure coil
- 11) In a 3-phase power measurement by two wattmeter method, both the wattmeters had identical readings. The power factor of the load was
- a) Unity
  - b) 0.8 lagging
  - c) 0.8 leading
  - d) Zero
- 12) A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be \_\_\_\_.
- a) 50 Hz
  - b) 25 Hz
  - c) 5 Hz
  - d) 2 Hz
- 13) A 50 Hz, 3-phase induction motor has a full load speed of 1500 rpm. The number of poles in the motor is \_\_\_\_.
- a) 2 pole
  - b) 4 pole
  - c) 6 pole
  - d) 8 pole
- 14) As compared to DOL starting method the star delta starting method should have \_\_\_\_.
- a) High torque
  - b) Low starting current
  - c) High starting current
  - d) Smooth acceleration

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**Set R**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electrical Machines**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What is working principle of DC generator? Derive the EMF equation of a DC generator.
- b) A dc generator generates an EMF of 450V and has 1000 armature conductors, flux per pole of 0.012 wb, speed of 1500 rpm and the armature winding has 4 parallel paths, find the number of poles.
- c) A dc shunt motor takes a load current of 40A from a 230V dc power supply the armature and field resistance are 0.25  $\Omega$  and 220  $\Omega$  respectively. Find the armature torque when the motor runs at 960rpm.
- d) Derive the torque equation of a DC motor.
- e) Discuss the power factor and causes of low power factor.

**Q.3 Solve any two:** **12**

- a) An 8pole d.c. shunt generator with 778 wave connected armature conductors and running at 500 rpm supplies load of 12.5  $\Omega$  resistance at terminal voltage of 50V. The armature resistance is 0.24  $\Omega$  and field resistance is 250  $\Omega$ . Find armature current, induced emf and flux per pole.
- b) Explain various schemes of speed control of dc motor.
- c) Explain two wattmeter method for three phase power measurement.

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain working of capacitor start single phase induction motor
- b) A 3ph delta/star connected 11000/440V, 50Hz transformer takes line current of 5 amp, when secondary load of 0.8 Lagging power factor is connected. Determine each coil current and output of transformer.
- c) On which factor the speed of three phase induction motor depends? And how to control the speed of three phase induction motor?
- d) A 4 pole, 50 (Hz) three phase induction motor running with speed 1440 (rpm). Find synchronous speed, slip speed, slip for this condition.
- e) Draw neat diagram of star delta starter and explain its operation.

**Q.5 Solve any Two.**

- a)** Draw and explain star- delta three phase transformer connections.  
Compare star- delta and delta- star three phase transformer connection.
- b)** Discuss about the working, types, characteristics and applications of universal motor.
- c)** A 3-phase induction motor is wound for 4 pole & is supplied from 50HZ system calculate
  - a) The synchronous speed
  - b) The speed of motor when the slip is 4%
  - c) The rotor current frequency when the motor runs at 600rpm.

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Set **S**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electrical Machines**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if required.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In a low power factor wattmeter the compensating coil is connected
  - a) In series with current coil
  - b) In parallel with current coil
  - c) In series with pressure coil
  - d) In parallel with pressure coil
- 2) In a 3-phase power measurement by two wattmeter method, both the wattmeters had identical readings. The power factor of the load was
  - a) Unity
  - b) 0.8 lagging
  - c) 0.8 leading
  - d) Zero
- 3) A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be \_\_\_\_\_.
  - a) 50 Hz
  - b) 25 Hz
  - c) 5 Hz
  - d) 2 Hz
- 4) A 50 Hz, 3-phase induction motor has a full load speed of 1500 rpm. The number of poles in the motor is \_\_\_\_\_.
  - a) 2 pole
  - b) 4 pole
  - c) 6 pole
  - d) 8 pole
- 5) As compared to DOL starting method the star delta starting method should have \_\_\_\_\_.
  - a) High torque
  - b) Low starting current
  - c) High starting current
  - d) Smooth acceleration
- 6) In a split-phase motor, the running winding should have \_\_\_\_\_.
  - a) High resistance and low inductance
  - b) High resistance and High inductance
  - c) Low resistance and high inductance
  - d) Low resistance and low inductance
- 7) If the capacitor of a single-phase motor is short-circuited
  - a) The motor will not start
  - b) The motor will run in the same direction at a reduced speed
  - c) The motor will run in the reverse direction
  - d) None of the above



- Page 14 of 16

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Electrical Machines**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What is working principle of DC generator? Derive the EMF equation of a DC generator.
- b) A dc generator generates an EMF of 450V and has 1000 armature conductors, flux per pole of 0.012 wb, speed of 1500 rpm and the armature winding has 4 parallel paths, find the number of poles.
- c) A dc shunt motor takes a load current of 40A from a 230V dc power supply the armature and field resistance are 0.25  $\Omega$  and 220  $\Omega$  respectively. Find the armature torque when the motor runs at 960rpm.
- d) Derive the torque equation of a DC motor.
- e) Discuss the power factor and causes of low power factor.

**Q.3 Solve any two:** **12**

- a) An 8pole d.c. shunt generator with 778 wave connected armature conductors and running at 500 rpm supplies load of 12.5  $\Omega$  resistance at terminal voltage of 50V. The armature resistance is 0.24  $\Omega$  and field resistance is 250  $\Omega$ . Find armature current, induced emf and flux per pole.
- b) Explain various schemes of speed control of dc motor.
- c) Explain two wattmeter method for three phase power measurement.

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain working of capacitor start single phase induction motor
- b) A 3ph delta/star connected 11000/440V, 50Hz transformer takes line current of 5 amp, when secondary load of 0.8 Lagging power factor is connected. Determine each coil current and output of transformer.
- c) On which factor the speed of three phase induction motor depends? And how to control the speed of three phase induction motor?
- d) A 4 pole, 50 (Hz) three phase induction motor running with speed 1440 (rpm). Find synchronous speed, slip speed, slip for this condition.
- e) Draw neat diagram of star delta starter and explain its operation.

**Q.5 Solve any Two.**

- a)** Draw and explain star- delta three phase transformer connections.  
Compare star- delta and delta- star three phase transformer connection.
- b)** Discuss about the working, types, characteristics and applications of universal motor.
- c)** A 3-phase induction motor is wound for 4 pole & is supplied from 50HZ system calculate
  - a) The synchronous speed
  - b) The speed of motor when the slip is 4%
  - c) The rotor current frequency when the motor runs at 600rpm.

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Set **P**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics Engineering**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The general solution of  $(D^2 - 4)^2 y = 0$  is \_\_\_\_\_.
  - a)  $y = C_1 e^{2x} + C_2 e^{-2x}$
  - b)  $y = (C_1 + C_2 x) e^{-2x} + (C_3 + C_4 x) e^{2x}$
  - c)  $y = C_1 \cos 2x + C_2 \sin 2x + (C_3 + C_4 x) e^{2x}$
  - d) None of these
- 2) For  $\frac{d^2 y}{dx^2} + 4 \frac{dy}{dx} + 3y = 3e^{2x}$ , the particular integral is \_\_\_\_\_.
  - a)  $\frac{1}{15} e^{2x}$
  - b)  $3e^{2x}$
  - c)  $\frac{1}{5} e^{2x}$
  - d)  $C_1 e^{-x} + C_2 e^{-2x}$
- 3) If the characteristic equation of the diff. equation  $\frac{d^2 y}{dx^2} + 2\alpha \frac{dy}{dx} + y = 0$  has two equal roots then the value of  $\alpha$  are \_\_\_\_\_.
  - a)  $\pm 1$
  - b)  $0, 0$
  - c)  $\pm i$
  - d)  $\pm \frac{1}{2}$
- 4) The conditions for expansion of a function in a Fourier series are known as \_\_\_\_\_.
  - a) Harmonic
  - b) Periodic
  - c) Riemann Conditions
  - d) Dirichlet's conditions
- 5) For the function  $f(x) = \begin{cases} 0, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$  The value of Fourier constant  $a_0$  is \_\_\_\_\_.
  - a)  $\frac{\pi^2}{4}$
  - b)  $\frac{\pi}{4}$
  - c)  $\frac{\pi^2}{2}$
  - d)  $\frac{-\pi}{4}$

- 6) Since  $z\{1\} = \frac{z}{z-1}$ ,  $z\{a^k\}, k \geq 0 =$  \_\_\_\_\_.  
 a)  $\frac{z}{z-a}$  b)  $\frac{z}{a(z-1)}$   
 c)  $\frac{a}{z-a}$  d)  $\frac{z}{az-1}$
- 7) The inverse z-transform of  $\frac{z}{z-3}, |z| > 3$  (with  $k \geq 0$ ) is \_\_\_\_\_.  
 a)  $3^{-k}$  b)  $3^{k+1}$   
 c)  $3^k$  d)  $3^{-k-1}$
- 8)  $L^{-1}\{\phi'(s)\} =$  \_\_\_\_\_.  
 a)  $\frac{-L^{-1}\{\phi(s)\}}{t}$  b)  $-t L^{-1}\{\phi(s)\}$   
 c)  $-L^{-1}\{\phi(s)\}$  d)  $-s L^{-1}\{\phi(s)\}$
- 9) If  $L\{f(t)\} = \frac{a}{s^2+a^2}$  then  $L\left\{\int_0^t f(t)dt\right\} =$  \_\_\_\_\_.  
 a)  $\frac{1}{s(s^2+a^2)}$  b)  $\frac{a}{s(s^2+a^2)}$   
 c)  $\frac{as}{s^2+a^2}$  d)  $\frac{as^2}{s^2+a^2}$
- 10) This method is called as method of chord \_\_\_\_\_.  
 a) Newton Raphson b) False Position  
 c) Bisection d) Both a and b
- 11) The first real positive root of  $x^3 = 6x - 4$  by Newton Raphson method near  $x_0 = 1$  is \_\_\_\_\_.  
 a) 0.6667 b) 0.6  
 c) 0.4 d) 0.3
- 12) The Two regression equations of the variables are  $x = 19.13 - 0.87y$ ,  $y = 11.64 - 0.5x$ . The means of  $x$  and  $y$  are \_\_\_\_\_.  
 a) 16, 2.93 b) 2.93, 16  
 c) 3.67, 15.93 d) 15.93, 3.67
- 13) If a Poisson distribution is such that  $p(x=2) = p(x=3)$  then  $m =$  \_\_\_\_\_.  
 a) 3 b)  $\frac{1}{3}$   
 c) 2 d) 4
- 14) In solving simultaneous linear equations  $AX = B$ , in which method as soon as getting the value of one unknown is immediately used to compute next unknown?  
 a) Jacobi b) Gauss Seidal  
 c) Euler's d) Gauss Elimination

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**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics Engineering**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three** **09**

- Solve:  $(D^2 + 4D + 5)y = -2 \cos hx + 2^x$
- Solve:  $(D^3 + D^2 + D + 1)y = \sin 2x$
- Find the Fourier series of  $f(x) = \begin{cases} \pi x, & 0 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$
- Find the half-range cosine series for  $f(x) = e^{-x}$  in  $(0, \pi)$
- Find the inverse z-transform of  $F(z) = \frac{1}{(z-2)(z-3)}$ , if  $|z| < 2$

**Q.3 Attempt any three** **09**

- Solve:  $(D^2 + D)y = x^2 + 2x + 4$
- Solve:  $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$
- Find the Fourier series of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$ , in  $(-\pi, \pi)$
- Find  $Z\{a^{|k|}\}$  for all  $k$
- Find  $Z^{-1}\left\{\frac{1}{(z-5)^2}\right\}$ ,  $|z| < 5$

**Q.4 Attempt any two** **10**

- A condenser of capacity  $C$  is discharged through an inductance  $L$  and resistance  $R$  in series and the charge  $q$  at a time satisfies the equation.

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{C} = 0$$

Given that  $L = 0.25$  Henries,  $R = 250$  ohms,  $C = 2 \times 10^{-6}$  farads and that at  $t = 0$ ,  $q = 0.002$  coulombs and the current  $\frac{dq}{dt} = 0$ , obtain  $q$  in terms of  $t$ .

- Find the Fourier series of  $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$
- Find Z-transform of  $f(k) = \cos \alpha k$ ,  $k \geq 0$

**Section – II**

**Q.5 Attempt any three** **09**

- If the mean of the binomial distribution is 2 and variance is  $\frac{4}{3}$  find the probability of
  - Two successes
  - Less than to successes

- b) Evaluate  $\int_0^{\infty} \frac{\cos 4t - \cos 3t}{t} dt$  by Laplace transform
- c) Find  $L^{-1}[\tan^{-1}(s + 1)]$
- d) Find the coefficient of correlation between  $x$  and  $y$  from the following data:  
 $n = 25$ ,  $\Sigma x = 120$ ,  $\Sigma x^2 = 650$ ,  $\Sigma y = 100$ ,  $\Sigma y^2 = 450$ ,  $\Sigma xy = 500$
- e) Find an approximate root of  $x \log_{10} x - 1.2 = 0$  by False Position method  
 (Perform 2 iterations)

**Q.6 Attempt any three****09**

- a) Fit a Poisson distribution

|       |     |    |    |   |   |
|-------|-----|----|----|---|---|
| $x$ : | 0   | 1  | 2  | 3 | 4 |
| $y$ : | 109 | 65 | 22 | 3 | 1 |

- b) Find Laplace transform of  $f(t) = \frac{2t}{3}$   $0 < t < 3$  and  $f(t)f(t + 3)$
- c) Solve by Gauss Elimination method, the following system of linear simultaneous equations  
 $x + y + 2z = 4$ ,  $3x + y - 3z = -4$ ,  $2x - 3y - 5z = -5$
- d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5 kgs. Find the number of students with weights between 45 and 60 kgs.  
 (For SNV  $z$  area under the Curve between  $z = 0$  and  $z = 1$  is 0.3413 and between  $z = 0$  and  $z = 2$  is 0.4772)
- e) Find the value of  $\sqrt{35}$  by Newton Raphson method, taking  $x_0 = 6$  as initial approximation, correct to 4 decimal places.

**Q.7 Attempt any two****10**

- a) Find  $L^{-1} \left[ \frac{s+29}{(s+4)(s^2+9)} \right]$
- b) Calculate Karl Pearson's coefficient of correlation and the equations of the lines of regression from the following data.
- |       |    |    |    |    |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|----|----|----|----|
| $x$ : | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| $y$ : | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 20 | 21 | 22 |
- c) Solve the following system by Jacobi's method (Perform 4 iterations)
- $$10x - 5y - 2z = 3$$
- $$4x - 10y + 3z = -3$$
- $$x + 6y + 10z = -3$$

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Set **Q**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics Engineering**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1)  $L^{-1}\{\phi'(s)\} = \underline{\hspace{2cm}}$ 
  - a)  $\frac{-L^{-1}\{\phi(s)\}}{t}$
  - b)  $-t L^{-1}\{\phi(s)\}$
  - c)  $-L^{-1}\{\phi(s)\}$
  - d)  $-s L^{-1}\{\phi(s)\}$
- 2) If  $L\{f(t)\} = \frac{a}{s^2+a^2}$  then  $L\left\{\int_0^t f(t)dt\right\} = \underline{\hspace{2cm}}$ 
  - a)  $\frac{1}{s(s^2+a^2)}$
  - b)  $\frac{a}{s(s^2+a^2)}$
  - c)  $\frac{as}{s^2+a^2}$
  - d)  $\frac{as^2}{s^2+a^2}$
- 3) This method is called as method of chord  $\underline{\hspace{2cm}}$ 
  - a) Newton Raphson
  - b) False Position
  - c) Bisection
  - d) Both a and b
- 4) The first real positive root of  $x^3 = 6x - 4$  by Newton Raphson method near  $x_0 = 1$  is  $\underline{\hspace{2cm}}$ .
  - a) 0.6667
  - b) 0.6
  - c) 0.4
  - d) 0.3
- 5) The Two regression equations of the variables are  $x = 19.13 - 0.87y$ ,  $y = 11.64 - 0.5x$ . The means of  $x$  and  $y$  are  $\underline{\hspace{2cm}}$ .
  - a) 16, 2.93
  - b) 2.93, 16
  - c) 3.67, 15.93
  - d) 15.93, 3.67
- 6) If a Poisson distribution is such that  $p(x = 2) = p(x = 3)$  then  $m =$ 
  - a) 3
  - b)  $\frac{1}{3}$
  - c) 2
  - d) 4



- Page 6 of 16

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Set **Q**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics Engineering**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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 3) Use of non-programmable calculator is allowed.

**Section – I****Q.2 Attempt any three****09**

- a) Solve:  $(D^2 + 4D + 5)y = -2 \cos hx + 2^x$   
 b) Solve:  $(D^3 + D^2 + D + 1)y = \sin 2x$   
 c) Find the Fourier series of  $f(x) = \begin{cases} \pi x, & 0 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$   
 d) Find the half-range cosine series for  $f(x) = e^{-x}$  in  $(0, \pi)$   
 e) Find the inverse z-transform of  $F(z) = \frac{1}{(z-2)(z-3)}$ , if  $|z| < 2$

**Q.3 Attempt any three****09**

- a) Solve:  $(D^2 + D)y = x^2 + 2x + 4$   
 b) Solve:  $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$   
 c) Find the Fourier series of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$ , in  $(-\pi, \pi)$   
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**Q.4 Attempt any two****10**

- a) A condenser of capacity  $C$  is discharged through an inductance  $L$  and resistance  $R$  in series and the charge  $q$  at a time satisfies the equation.

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{C} = 0$$

Given that  $L = 0.25$  Henries,  $R = 250$  ohms,  $C = 2 \times 10^{-6}$  farads and that at  $t = 0$ ,  $q = 0.002$  coulombs and the current  $\frac{dq}{dt} = 0$ , obtain  $q$  in terms of  $t$ .

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 c) Find Z-transform of  $f(k) = \cos \alpha k$ ,  $k \geq 0$

**Section – II****Q.5 Attempt any three****09**

- a) If the mean of the binomial distribution is 2 and variance is  $\frac{4}{3}$  find the probability of  
 i) Two successes  
 ii) Less than to successes

- b) Evaluate  $\int_0^{\infty} \frac{\cos 4t - \cos 3t}{t} dt$  by Laplace transform
- c) Find  $L^{-1}[\tan^{-1}(s + 1)]$
- d) Find the coefficient of correlation between  $x$  and  $y$  from the following data:  
 $n = 25$ ,  $\Sigma x = 120$ ,  $\Sigma x^2 = 650$ ,  $\Sigma y = 100$ ,  $\Sigma y^2 = 450$ ,  $\Sigma xy = 500$
- e) Find an approximate root of  $x \log_{10} x - 1.2 = 0$  by False Position method (Perform 2 iterations)

**Q.6 Attempt any three****09**

- a) Fit a Poisson distribution

|      |     |    |    |   |   |
|------|-----|----|----|---|---|
| $x:$ | 0   | 1  | 2  | 3 | 4 |
| $y:$ | 109 | 65 | 22 | 3 | 1 |

- b) Find Laplace transform of  $f(t) = \frac{2t}{3}$   $0 < t < 3$  and  $f(t)f(t + 3)$
- c) Solve by Gauss Elimination method, the following system of linear simultaneous equations  
 $x + y + 2z = 4$ ,  $3x + y - 3z = -4$ ,  $2x - 3y - 5z = -5$
- d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5 kgs. Find the number of students with weights between 45 and 60 kgs.  
 (For SNV  $z$  area under the Curve between  $z = 0$  and  $z = 1$  is 0.3413 and between  $z = 0$  and  $z = 2$  is 0.4772)
- e) Find the value of  $\sqrt{35}$  by Newton Raphson method, taking  $x_0 = 6$  as initial approximation, correct to 4 decimal places.

**Q.7 Attempt any two****10**

- a) Find  $L^{-1} \left[ \frac{s+29}{(s+4)(s^2+9)} \right]$
- b) Calculate Karl Pearson's coefficient of correlation and the equations of the lines of regression from the following data.
- |      |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|
| $x:$ | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| $y:$ | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 20 | 21 | 22 |
- c) Solve the following system by Jacobi's method (Perform 4 iterations)
- $$10x - 5y - 2z = 3$$
- $$4x - 10y + 3z = -3$$
- $$x + 6y + 10z = -3$$

**Seat  
No.**

| Set | R |
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## Max. Marks: 70

### MCQ/Objective Type Questions

Marks: 14

14

- 1) The first real positive root of  $x^3 = 6x - 4$  by Newton Raphson method near  $x_0 = 1$  is \_\_\_\_\_.  
a) 0.6667                                      b) 0.6  
c) 0.4                                          d) 0.3
- 2) The Two regression equations of the variables are  $x = 19.13 - 0.87y$ ,  $y = 11.64 - 0.5x$ . The means of  $x$  and  $y$  are \_\_\_\_\_.  
a) 16, 2.93                                    b) 2.93, 16  
c) 3.67, 15.93                                d) 15.93, 3.67
- 3) If a Poisson distribution is such that  $p(x = 2) = p(x = 3)$  then  $m =$  \_\_\_\_\_.  
a) 3                                                b)  $\frac{1}{3}$   
c) 2                                                d) 4
- 4) In solving simultaneous linear equations  $AX = B$ , in which method as soon as getting the value of one unknown is immediately used to compute next unknown?  
a) Jacobi                                          b) Gauss Seidal  
c) Euler's                                         d) Gauss Elimination
- 5) The general solution of  $(D^2 - 4)^2 y = 0$  is \_\_\_\_\_.  
a)  $y = C_1 e^{2x} + C_2 e^{-2x}$   
b)  $y = (C_1 + C_2 x)e^{-2x} + (C_3 + C_4 x)e^{2x}$   
c)  $y = C_1 \cos 2x + C_2 \sin 2x + (C_3 + C_4 x)e^{2x}$   
d) None of these
- 6) For  $\frac{d^2 y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$ , the particular integral is \_\_\_\_\_.  
a)  $\frac{1}{15}e^{2x}$                                         b)  $3e^{2x}$   
c)  $\frac{1}{5}e^{2x}$                                         d)  $C_1 e^{-x} + C_2 e^{-2x}$



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| Seat No. |  |
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| Set | R |
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**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics Engineering**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three** **09**

- Solve:  $(D^2 + 4D + 5)y = -2 \cos hx + 2^x$
- Solve:  $(D^3 + D^2 + D + 1)y = \sin 2x$
- Find the Fourier series of  $f(x) = \begin{cases} \pi x, & 0 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$
- Find the half-range cosine series for  $f(x) = e^{-x}$  in  $(0, \pi)$
- Find the inverse z-transform of  $F(z) = \frac{1}{(z-2)(z-3)}$ , if  $|z| < 2$

**Q.3 Attempt any three** **09**

- Solve:  $(D^2 + D)y = x^2 + 2x + 4$
- Solve:  $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$
- Find the Fourier series of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$ , in  $(-\pi, \pi)$
- Find  $Z\{a^{|k|}\}$  for all  $k$
- Find  $Z^{-1}\left\{\frac{1}{(z-5)^2}\right\}$ ,  $|z| < 5$

**Q.4 Attempt any two** **10**

- A condenser of capacity  $C$  is discharged through an inductance  $L$  and resistance  $R$  in series and the charge  $q$  at a time satisfies the equation.

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{C} = 0$$

Given that  $L = 0.25$  Henries,  $R = 250$  ohms,  $C = 2 \times 10^{-6}$  farads and that at  $t = 0$ ,  $q = 0.002$  coulombs and the current  $\frac{dq}{dt} = 0$ , obtain  $q$  in terms of  $t$ .

- Find the Fourier series of  $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$
- Find Z-transform of  $f(k) = \cos \alpha k$ ,  $k \geq 0$

**Section – II**

**Q.5 Attempt any three** **09**

- If the mean of the binomial distribution is 2 and variance is  $\frac{4}{3}$  find the probability of
  - Two successes
  - Less than to successes

- b) Evaluate  $\int_0^{\infty} \frac{\cos 4t - \cos 3t}{t} dt$  by Laplace transform
- c) Find  $L^{-1}[\tan^{-1}(s + 1)]$
- d) Find the coefficient of correlation between  $x$  and  $y$  from the following data:  
 $n = 25, \Sigma x = 120, \Sigma x^2 = 650, \Sigma y = 100, \Sigma y^2 = 450, \Sigma xy = 500$
- e) Find an approximate root of  $x \log_{10} x - 1.2 = 0$  by False Position method (Perform 2 iterations)

**Q.6 Attempt any three****09**

- a) Fit a Poisson distribution

|      |     |    |    |   |   |
|------|-----|----|----|---|---|
| $x:$ | 0   | 1  | 2  | 3 | 4 |
| $y:$ | 109 | 65 | 22 | 3 | 1 |

- b) Find Laplace transform of  $f(t) = \frac{2t}{3}, 0 < t < 3$  and  $f(t)f(t + 3)$
- c) Solve by Gauss Elimination method, the following system of linear simultaneous equations  
 $x + y + 2z = 4, \quad 3x + y - 3z = -4, \quad 2x - 3y - 5z = -5$
- d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5 kgs. Find the number of students with weights between 45 and 60 kgs.  
 (For SNV  $z$  area under the Curve between  $z = 0$  and  $z = 1$  is 0.3413 and between  $z = 0$  and  $z = 2$  is 0.4772)
- e) Find the value of  $\sqrt{35}$  by Newton Raphson method, taking  $x_0 = 6$  as initial approximation, correct to 4 decimal places.

**Q.7 Attempt any two****10**

- a) Find  $L^{-1}\left[\frac{s+29}{(s+4)(s^2+9)}\right]$
- b) Calculate Karl Pearson's coefficient of correlation and the equations of the lines of regression from the following data.
- |      |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|
| $x:$ | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| $y:$ | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 20 | 21 | 22 |
- c) Solve the following system by Jacobi's method (Perform 4 iterations)
- $$10x - 5y - 2z = 3$$
- $$4x - 10y + 3z = -3$$
- $$x + 6y + 10z = -3$$

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Set **S**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics Engineering**  
**Engineering Mathematics – III**

Day &amp; Date: Monday, 13-03-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Since  $z\{1\} = \frac{z}{z-1}$ ,  $z\{a^k\}$ ,  $k \geq 0 =$  \_\_\_\_\_.
  - a)  $\frac{z}{z-a}$
  - b)  $\frac{z}{a(z-1)}$
  - c)  $\frac{a}{z-a}$
  - d)  $\frac{z}{az-1}$
- 2) The inverse z-transform of  $\frac{z}{z-3}$ ,  $|z| > 3$  (with  $k \geq 0$ ) is \_\_\_\_\_.
  - a)  $3^{-k}$
  - b)  $3^{k+1}$
  - c)  $3^k$
  - d)  $3^{-k-1}$
- 3)  $L^{-1}\{\phi'(s)\} =$  \_\_\_\_\_.
  - a)  $\frac{-L^{-1}\{\phi(s)\}}{t}$
  - b)  $-t L^{-1}\{\phi(s)\}$
  - c)  $-L^{-1}\{\phi(s)\}$
  - d)  $-s L^{-1}\{\phi(s)\}$
- 4) If  $L\{f(t)\} = \frac{a}{s^2+a^2}$  then  $L\left\{\int_0^t f(t)dt\right\} =$  \_\_\_\_\_.
  - a)  $\frac{1}{s(s^2+a^2)}$
  - b)  $\frac{a}{s(s^2+a^2)}$
  - c)  $\frac{as}{s^2+a^2}$
  - d)  $\frac{as^2}{s^2+a^2}$
- 5) This method is called as method of chord \_\_\_\_\_.
  - a) Newton Raphson
  - b) False Position
  - c) Bisection
  - d) Both a and b
- 6) The first real positive root of  $x^3 = 6x - 4$  by Newton Raphson method near  $x_0 = 1$  is \_\_\_\_\_.
  - a) 0.6667
  - b) 0.6
  - c) 0.4
  - d) 0.3
- 7) The Two regression equations of the variables are  $x = 19.13 - 0.87y$ ,  $y = 11.64 - 0.5x$ . The means of  $x$  and  $y$  are \_\_\_\_\_.
  - a) 16, 2.93
  - b) 2.93, 16
  - c) 3.67, 15.93
  - d) 15.93, 3.67



- Page 14 of 16

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Set **S**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**Electronics Engineering**  
**Engineering Mathematics – III**

Day &amp; Date: Monday, 13-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I****Q.2 Attempt any three****09**

- a) Solve:  $(D^2 + 4D + 5)y = -2 \cos hx + 2^x$   
 b) Solve:  $(D^3 + D^2 + D + 1)y = \sin 2x$   
 c) Find the Fourier series of  $f(x) = \begin{cases} \pi x, & 0 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$   
 d) Find the half-range cosine series for  $f(x) = e^{-x}$  in  $(0, \pi)$   
 e) Find the inverse z-transform of  $F(z) = \frac{1}{(z-2)(z-3)}$ , if  $|z| < 2$

**Q.3 Attempt any three****09**

- a) Solve:  $(D^2 + D)y = x^2 + 2x + 4$   
 b) Solve:  $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$   
 c) Find the Fourier series of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$ , in  $(-\pi, \pi)$   
 d) Find  $Z\{a^{|k|}\}$  for all  $k$   
 e) Find  $Z^{-1}\left\{\frac{1}{(z-5)^2}\right\}$ ,  $|z| < 5$

**Q.4 Attempt any two****10**

- a) A condenser of capacity  $C$  is discharged through an inductance  $L$  and resistance  $R$  in series and the charge  $q$  at a time satisfies the equation.

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{C} = 0$$

Given that  $L = 0.25$  Henries,  $R = 250$  ohms,  $C = 2 \times 10^{-6}$  farads and that at  $t = 0$ ,  $q = 0.002$  coulombs and the current  $\frac{dq}{dt} = 0$ , obtain  $q$  in terms of  $t$ .

- b) Find the Fourier series of  $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$   
 c) Find Z-transform of  $f(k) = \cos \alpha k$ ,  $k \geq 0$

**Section – II****Q.5 Attempt any three****09**

- a) If the mean of the binomial distribution is 2 and variance is  $\frac{4}{3}$  find the probability of  
 i) Two successes  
 ii) Less than to successes

- b) Evaluate  $\int_0^{\infty} \frac{\cos 4t - \cos 3t}{t} dt$  by Laplace transform
- c) Find  $L^{-1}[\tan^{-1}(s + 1)]$
- d) Find the coefficient of correlation between  $x$  and  $y$  from the following data:  
 $n = 25$ ,  $\Sigma x = 120$ ,  $\Sigma x^2 = 650$ ,  $\Sigma y = 100$ ,  $\Sigma y^2 = 450$ ,  $\Sigma xy = 500$
- e) Find an approximate root of  $x \log_{10} x - 1.2 = 0$  by False Position method  
 (Perform 2 iterations)

**Q.6 Attempt any three****09**

- a) Fit a Poisson distribution

|      |     |    |    |   |   |
|------|-----|----|----|---|---|
| $x:$ | 0   | 1  | 2  | 3 | 4 |
| $y:$ | 109 | 65 | 22 | 3 | 1 |

- b) Find Laplace transform of  $f(t) = \frac{2t}{3}$   $0 < t < 3$  and  $f(t)f(t + 3)$
- c) Solve by Gauss Elimination method, the following system of linear simultaneous equations  
 $x + y + 2z = 4$ ,  $3x + y - 3z = -4$ ,  $2x - 3y - 5z = -5$
- d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5 kgs. Find the number of students with weights between 45 and 60 kgs.  
 (For SNV  $z$  area under the Curve between  $z = 0$  and  $z = 1$  is 0.3413 and between  $z = 0$  and  $z = 2$  is 0.4772)
- e) Find the value of  $\sqrt{35}$  by Newton Raphson method, taking  $x_0 = 6$  as initial approximation, correct to 4 decimal places.

**Q.7 Attempt any two****10**

- a) Find  $L^{-1}\left[\frac{s+29}{(s+4)(s^2+9)}\right]$
- b) Calculate Karl Pearson's coefficient of correlation and the equations of the lines of regression from the following data.
- |      |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|
| $x:$ | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| $y:$ | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 20 | 21 | 22 |
- c) Solve the following system by Jacobi's method (Perform 4 iterations)
- $$10x - 5y - 2z = 3$$
- $$4x - 10y + 3z = -3$$
- $$x + 6y + 10z = -3$$

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Signals & Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Shifting property of impulse is  $X[n] * \delta[n - n_0] =$ 
  - a)  $X[n]$
  - b)  $\delta[n]$
  - c)  $X[n - n_0]$
  - d)  $\delta[n - n_0]$
- 2) The system  $y(t) = x^2(t) + 6$  is \_\_\_\_\_.
  - a) Linear
  - b) Non Linear
  - c) Invertible
  - d) None of these
- 3) The system  $y[n] = x[-n]$  is \_\_\_\_\_.
  - a) Time variant
  - b) Time invariant
  - c) Both
  - d) None of these
- 4) Given sequence  $x_1[n] = \{1, -2, 3, 1\}$  &  $x_2[n] = \{2, -3, -2\}$  then their convolution  $y[n]$  is \_\_\_\_\_.
  - a)  $\{2, -7, 10, -7\}$
  - b)  $\{2, -7, 10, -3, -9, -2\}$
  - c)  $\{10, -7, -9, 2\}$
  - d)  $\{2, -7, 10, -7, 9\}$
- 5) Odd signal satisfies \_\_\_\_\_.
  - a)  $x(-t) = x(t)$
  - b)  $x[-n] = -x[n]$
  - c)  $x[n + 1] = a x[n] + b$
  - d)  $dx(t)/dt = \text{constant}$
- 6) Energy signals are the signals with \_\_\_\_\_.
  - a)  $0 < E < \infty, P = 0$
  - b)  $0 < E < \infty, P = \infty$
  - c)  $0 < P < \infty, E = \infty$
  - d)  $0 < P < \infty, E = 0$
- 7) Any periodic signal may be called as \_\_\_\_\_.
  - a) Causal
  - b) Non Causal
  - c) Anti Causal
  - d) None of these
- 8) ROC of sequence  $x[n] = u[n]$  is \_\_\_\_\_.
  - a)  $|z| > 1$
  - b)  $|z| < 1$
  - c) No ROC
  - d)  $-1 < |z| < 1$
- 9) If a signal  $f(t)$  has energy  $E$ , the energy of  $f(2t)$  is \_\_\_\_\_.
  - a)  $E$
  - b)  $E/2$
  - c)  $2E$
  - d)  $4E$

- 10) ZT reduces to FT when it is evaluated on \_\_\_\_\_ circle.

|         |              |
|---------|--------------|
| a) Half | b) Z         |
| c) Unit | d) Imaginary |
- 11) Following system is time invariant.

|                    |                             |
|--------------------|-----------------------------|
| a) $y(t) = x(2t)$  | b) $y(t) = x(t) + x(t - 1)$ |
| c) $y(t) = x(t/2)$ | d) $y(t) = x(-t)$           |
- 12) Sampled frequency less than Nyquist rate is called \_\_\_\_\_ sampling.

|             |         |
|-------------|---------|
| a) Under    | b) Over |
| c) Critical | d) None |
- 13) According to properties of ZT, ROC cannot contain \_\_\_\_\_

|          |          |
|----------|----------|
| a) Zeros | b) Poles |
| c) Both  | d) None  |
- 14) Unit ramp signal can be expressed as \_\_\_\_\_.

|               |                   |
|---------------|-------------------|
| a) $u(t) + t$ | b) $u(t) - t$     |
| c) $u(t)/t$   | d) $t \cdot u(t)$ |

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Signals & Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

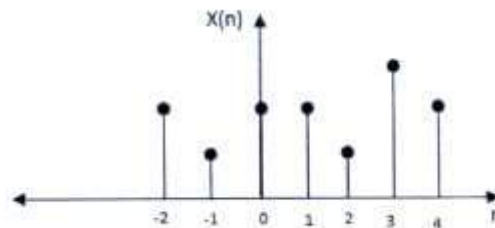
**Section – I**

**Q.2 Attempt any Four.**

**12**

- 1) Sketch given signal  $y(t) = r(t - 1) + u(t)$
- 2) Find even & odd component of  $x(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$
- 3) Obtain direct form I structure of system described by  
 $y(n) - (2/3)y(n - 1) + (1/5)y(n - 2) = x(n) + 2x(n - 1)$
- 4) Determine energy of signal.  $X[n] = (1/2)^2 u(n)$
- 5) Let  $x[n] = 0$  for  $n < -2$  and  $n > 4$ . For each signal given below determine values of  $n$  for which it is guaranteed to be zero.

- i)  $x[n-3]$
- ii)  $x[n+4]$
- iii)  $x[-n]$
- iv)  $x[-n+2]$



**Q.3 Attempt any two:**

**16**

- 1) Determine convolution of following signals. Sketch result.  
 $y(n) = (0.5)^n u[n]$        $x(n) = u[n]$
- 2) Determine whether following system is 1. Static or Dynamic 2. Linear or nonlinear 3. Time variant or time invariant 4. Causal or Non-causal 5. Stable or Unstable.  $y(t) = 10 x(t) + 5$
- 3) Find even and odd part of signal  $x[n] = \{3, 2, 1, 1, 1, 2, 1, 1\}$   

$\uparrow$   
 (The arrow points to the 4th element of the sequence, which is 1.)

**Section – II**

**Q.4 Attempt any Four.**

**12**

- 1) State & Prove convolution property of CT Fourier Transform.
- 2) Find Z.T. with its ROC for  $x(n) = (a)^n u[n]$
- 3) Find F.T of  $x(t) = e^{-at} u(t)$
- 4) Find Nyquist sampling rate for  $x(t) = 5 \cdot \cos(1000 \pi t) \cdot \cos(6000 \pi t)$
- 5) The analog signal  $m(t)$  is given below. Calculate Nyquist sampling rate.  
 $m(t) = 4 \cos(50 \pi t) + 8 \sin(300 \pi t) - \cos(100 \pi t)$

**Q.5 Attempt any two:**

- 1) The analog signal given below is  $m(t) = 4 \cos 100 \pi t$ .
  - a) Calculate Nyquist rate b) What is DT signal after sampling for  
1)  $F_s = 200 \text{ Hz}$  & 2)  $F_s = 75 \text{ Hz}$
- 2) Find Fourier series coefficient using trigonometric Fourier series method for Full wave rectified signal with fundamental frequency  $\omega_0 = \pi$
- 3) State and prove any two properties of Laplace transform.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 5 of 16



- 11) Given sequence  $x_1[n] = \{1, -2, 3, 1\}$  &  $x_2[n] = \{2, -3, -2\}$  then their convolution  $y[n]$  is \_\_\_\_\_.  
 a)  $\{2, -7, 10, -7\}$                       b)  $\{2, -7, 10, -3, -9, -2\}$   
 c)  $\{10, -7, -9, 2\}$                       d)  $\{2, -7, 10, -7, 9\}$
- 12) Odd signal satisfies \_\_\_\_\_.  
 a)  $x(-t) = x(t)$                       b)  $x[-n] = -x[n]$   
 c)  $x[n+1] = a x[n] + b$                       d)  $dx(t)/dt = \text{constant}$
- 13) Energy signals are the signals with \_\_\_\_\_.  
 a)  $0 < E < \infty, P = 0$                       b)  $0 < E < \infty, P = \infty$   
 c)  $0 < P < \infty, E = \infty$                       d)  $0 < P < \infty, E = 0$
- 14) Any periodic signal may be called as \_\_\_\_\_.  
 a) Causal                      b) Non Causal  
 c) Anti Causal                      d) None of these

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Signals & Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

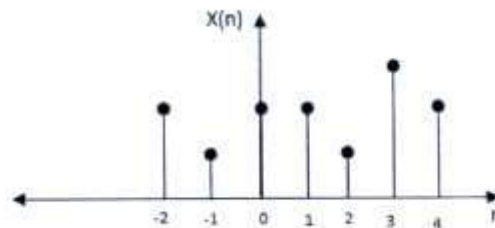
**Section – I**

**Q.2 Attempt any Four.**

**12**

- 1) Sketch given signal  $y(t) = r(t - 1) + u(t)$
- 2) Find even & odd component of  $x(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$
- 3) Obtain direct form I structure of system described by  
 $y(n) - (2/3)y(n - 1) + (1/5)y(n - 2) = x(n) + 2x(n - 1)$
- 4) Determine energy of signal.  $X[n] = (1/2)^2 u(n)$
- 5) Let  $x[n] = 0$  for  $n < -2$  and  $n > 4$ . For each signal given below determine values of  $n$  for which it is guaranteed to be zero.

- i)  $x[n-3]$
- ii)  $x[n+4]$
- iii)  $x[-n]$
- iv)  $x[-n+2]$



**Q.3 Attempt any two:**

**16**

- 1) Determine convolution of following signals. Sketch result.  
 $y(n) = (0.5)^n u[n]$        $x(n) = u[n]$
- 2) Determine whether following system is 1. Static or Dynamic 2. Linear or nonlinear 3. Time variant or time invariant 4. Causal or Non-causal 5. Stable or Unstable.  $y(t) = 10 x(t) + 5$
- 3) Find even and odd part of signal  $x[n] = \{3, 2, 1, 1, 1, 2, 1, 1\}$   

$\uparrow$   
 (positioned under the 4th element, which is 1)

**Section – II**

**Q.4 Attempt any Four.**

**12**

- 1) State & Prove convolution property of CT Fourier Transform.
- 2) Find Z.T. with its ROC for  $x(n) = (a)^n u[n]$
- 3) Find F.T of  $x(t) = e^{-at} u(t)$
- 4) Find Nyquist sampling rate for  $x(t) = 5 \cdot \cos(1000 \pi t) \cdot \cos(6000 \pi t)$
- 5) The analog signal  $m(t)$  is given below. Calculate Nyquist sampling rate.  
 $m(t) = 4 \cos(50 \pi t) + 8 \sin(300 \pi t) - \cos(100 \pi t)$

**Q.5 Attempt any two:**

- 1) The analog signal given below is  $m(t) = 4 \cos 100 \pi t$ .  
a) Calculate Nyquist rate b) What is DT signal after sampling for  
1)  $F_s = 200 \text{ Hz}$  & 2)  $F_s = 75 \text{ Hz}$
- 2) Find Fourier series coefficient using trigonometric Fourier series method for Full wave rectified signal with fundamental frequency  $\omega_0 = \pi$
- 3) State and prove any two properties of Laplace transform.

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Signals & Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Following system is time invariant.
  - a)  $y(t) = x(2t)$
  - b)  $y(t) = x(t) + x(t - 1)$
  - c)  $y(t) = x(t/2)$
  - d)  $y(t) = x(-t)$
- 2) Sampled frequency less than Nyquist rate is called \_\_\_\_\_ sampling.
  - a) Under
  - b) Over
  - c) Critical
  - d) None
- 3) According to properties of ZT, ROC cannot contain \_\_\_\_\_.
  - a) Zeros
  - b) Poles
  - c) Both
  - d) None
- 4) Unit ramp signal can be expressed as \_\_\_\_\_.
  - a)  $u(t) + t$
  - b)  $u(t) - t$
  - c)  $u(t)/t$
  - d)  $t \cdot u(t)$
- 5) Shifting property of impulse is  $X[n] * \delta[n - n_0] =$ 
  - a)  $X[n]$
  - b)  $\delta[n]$
  - c)  $X[n - n_0]$
  - d)  $\delta[n - n_0]$
- 6) The system  $y(t) = x^2(t) + 6$  is \_\_\_\_\_.
  - a) Linear
  - b) Non Linear
  - c) Invertible
  - d) None of these
- 7) The system  $y[n] = x[-n]$  is \_\_\_\_\_.
  - a) Time variant
  - b) Time invariant
  - c) Both
  - d) None of these
- 8) Given sequence  $x_1[n] = \{1, -2, 3, 1\}$  &  $x_2[n] = \{2, -3, -2\}$  then their convolution  $y[n]$  is \_\_\_\_\_.
  - a)  $\{2, -7, 10, -7\}$
  - b)  $\{2, -7, 10, -3, -9, -2\}$
  - c)  $\{10, -7, -9, 2\}$
  - d)  $\{2, -7, 10, -7, 9\}$
- 9) Odd signal satisfies \_\_\_\_\_.
  - a)  $x(-t) = x(t)$
  - b)  $x[-n] = -x[n]$
  - c)  $x[n + 1] = a x[n] + b$
  - d)  $dx(t)/dt = \text{constant}$

- 10) Energy signals are the signals with \_\_\_\_\_.  
a)  $0 < E < \infty, P = 0$                       b)  $0 < E < \infty, P = \infty$   
c)  $0 < P < \infty, E = \infty$                       d)  $0 < P < \infty, E = 0$
- 11) Any periodic signal may be called as \_\_\_\_\_.  
a) Causal                                              b) Non Causal  
c) Anti Causal                                      d) None of these
- 12) ROC of sequence  $x[n] = u[n]$  is \_\_\_\_\_.  
a)  $|z| > 1$                                               b)  $|z| < 1$   
c) No ROC                                              d)  $-1 < |z| < 1$
- 13) If a signal  $f(t)$  has energy  $E$ , the energy of  $f(2t)$  is \_\_\_\_\_.  
a)  $E$                                                       b)  $E/2$   
c)  $2E$                                                       d)  $4E$
- 14) ZT reduces to FT when it is evaluated on \_\_\_\_\_ circle.  
a) Half                                                      b) Z  
c) Unit                                                      d) Imaginary

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Signals & Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

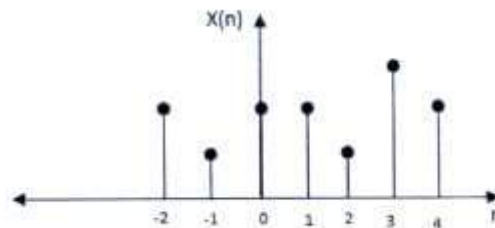
**Section – I**

**Q.2 Attempt any Four.**

**12**

- 1) Sketch given signal  $y(t) = r(t - 1) + u(t)$
- 2) Find even & odd component of  $x(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$
- 3) Obtain direct form I structure of system described by  
 $y(n) - (2/3)y(n - 1) + (1/5)y(n - 2) = x(n) + 2x(n - 1)$
- 4) Determine energy of signal.  $X[n] = (1/2)^2 u(n)$
- 5) Let  $x[n] = 0$  for  $n < -2$  and  $n > 4$ . For each signal given below determine values of  $n$  for which it is guaranteed to be zero.

- i)  $x[n-3]$
- ii)  $x[n+4]$
- iii)  $x[-n]$
- iv)  $x[-n+2]$



**Q.3 Attempt any two:**

**16**

- 1) Determine convolution of following signals. Sketch result.  
 $y(n) = (0.5)^n u[n]$        $x(n) = u[n]$
- 2) Determine whether following system is 1. Static or Dynamic 2. Linear or nonlinear 3. Time variant or time invariant 4. Causal or Non-causal 5. Stable or Unstable.  $y(t) = 10 x(t) + 5$
- 3) Find even and odd part of signal  $x[n] = \{3, 2, 1, 1, 1, 2, 1, 1\}$   

$\uparrow$   
 (positioned under the 4th element, which is 1)

**Section – II**

**Q.4 Attempt any Four.**

**12**

- 1) State & Prove convolution property of CT Fourier Transform.
- 2) Find Z.T. with its ROC for  $x(n) = (a)^n u[n]$
- 3) Find F.T of  $x(t) = e^{-at} u(t)$
- 4) Find Nyquist sampling rate for  $x(t) = 5 \cdot \cos(1000 \pi t) \cdot \cos(6000 \pi t)$
- 5) The analog signal  $m(t)$  is given below. Calculate Nyquist sampling rate.  
 $m(t) = 4 \cos(50 \pi t) + 8 \sin(300 \pi t) - \cos(100 \pi t)$

**Q.5 Attempt any two:**

- 1) The analog signal given below is  $m(t) = 4 \cos 100 \pi t$ .  
a) Calculate Nyquist rate b) What is DT signal after sampling for  
1)  $F_s = 200 \text{ Hz}$  & 2)  $F_s = 75 \text{ Hz}$
- 2) Find Fourier series coefficient using trigonometric Fourier series method for Full wave rectified signal with fundamental frequency  $\omega_0 = \pi$
- 3) State and prove any two properties of Laplace transform.

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Signals & Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Energy signals are the signals with \_\_\_\_\_.  
 a)  $0 < E < \infty, P = 0$                       b)  $0 < E < \infty, P = \infty$   
 c)  $0 < P < \infty, E = \infty$                       d)  $0 < P < \infty, E = 0$
- 2) Any periodic signal may be called as \_\_\_\_\_.  
 a) Causal                                              b) Non Causal  
 c) Anti Causal                                      d) None of these
- 3) ROC of sequence  $x[n] = u[n]$  is \_\_\_\_\_.  
 a)  $|z| > 1$                                               b)  $|z| < 1$   
 c) No ROC                                              d)  $-1 < |z| < 1$
- 4) If a signal  $f(t)$  has energy  $E$ , the energy of  $f(2t)$  is \_\_\_\_\_.  
 a)  $E$                                                       b)  $E/2$   
 c)  $2E$                                                       d)  $4E$
- 5) ZT reduces to FT when it is evaluated on \_\_\_\_\_ circle.  
 a) Half                                                      b) Z  
 c) Unit                                                      d) Imaginary
- 6) Following system is time invariant.  
 a)  $y(t) = x(2t)$                                       b)  $y(t) = x(t) + x(t - 1)$   
 c)  $y(t) = x(t/2)$                                       d)  $y(t) = x(-t)$
- 7) Sampled frequency less than Nyquist rate is called \_\_\_\_\_ sampling.  
 a) Under                                                      b) Over  
 c) Critical                                                      d) None
- 8) According to properties of ZT, ROC cannot contain \_\_\_\_\_.  
 a) Zeros                                                      b) Poles  
 c) Both                                                      d) None
- 9) Unit ramp signal can be expressed as \_\_\_\_\_.  
 a)  $u(t) + t$                                               b)  $u(t) - t$   
 c)  $u(t)/t$                                                       d)  $t.u(t)$



- 10) Shifting property of impulse is  $X[n] * \delta[n - n_0] =$   
a)  $X[n]$  b)  $\delta[n]$   
c)  $X[n - n_0]$  d)  $\delta[n - n_0]$
- 11) The system  $y(t) = x^2(t) + 6$  is \_\_\_\_\_.  
a) Linear b) Non Linear  
c) Invertible d) None of these
- 12) The system  $y[n] = x[-n]$  is \_\_\_\_\_.  
a) Time variant b) Time invariant  
c) Both d) None of these
- 13) Given sequence  $x_1[n] = \{1, -2, 3, 1\}$  &  $x_2[n] = \{2, -3, -2\}$  then their convolution  $y[n]$  is \_\_\_\_\_.  
a)  $\{2, -7, 10, -7\}$  b)  $\{2, -7, 10, -3, -9, -2\}$   
c)  $\{10, -7, -9, 2\}$  d)  $\{2, -7, 10, -7, 9\}$
- 14) Odd signal satisfies \_\_\_\_\_.  
a)  $x(-t) = x(t)$  b)  $x[-n] = -x[n]$   
c)  $x[n + 1] = a x[n] + b$  d)  $dx(t)/dt = \text{constant}$

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Signals & Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

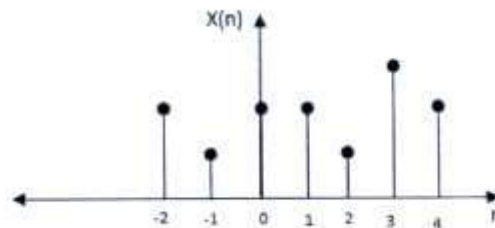
Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Attempt any Four.****12**

- 1) Sketch given signal  $y(t) = r(t - 1) + u(t)$
- 2) Find even & odd component of  $x(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$
- 3) Obtain direct form I structure of system described by  
 $y(n) - (2/3)y(n - 1) + (1/5)y(n - 2) = x(n) + 2x(n - 1)$
- 4) Determine energy of signal.  $X[n] = (1/2)^2 u(n)$
- 5) Let  $x[n] = 0$  for  $n < -2$  and  $n > 4$ . For each signal given below determine values of  $n$  for which it is guaranteed to be zero.

- i)  $x[n-3]$
- ii)  $x[n+4]$
- iii)  $x[-n]$
- iv)  $x[-n+2]$

**Q.3 Attempt any two:****16**

- 1) Determine convolution of following signals. Sketch result.  
 $y(n) = (0.5)^n u[n]$        $x(n) = u[n]$
- 2) Determine whether following system is 1. Static or Dynamic 2. Linear or nonlinear 3. Time variant or time invariant 4. Causal or Non-causal 5. Stable or Unstable.  $y(t) = 10 x(t) + 5$
- 3) Find even and odd part of signal  $x[n] = \{3, 2, 1, 1, 1, 2, 1, 1\}$   

↑

**Section – II****Q.4 Attempt any Four.****12**

- 1) State & Prove convolution property of CT Fourier Transform.
- 2) Find Z.T. with its ROC for  $x(n) = (a)^n u[n]$
- 3) Find F.T of  $x(t) = e^{-at} u(t)$
- 4) Find Nyquist sampling rate for  $x(t) = 5 \cdot \cos(1000 \pi t) \cdot \cos(6000 \pi t)$
- 5) The analog signal  $m(t)$  is given below. Calculate Nyquist sampling rate.  
 $m(t) = 4 \cos(50 \pi t) + 8 \sin(300 \pi t) - \cos(100 \pi t)$

**Q.5 Attempt any two:**

- 1) The analog signal given below is  $m(t) = 4 \cos 100 \pi t$ .  
a) Calculate Nyquist rate b) What is DT signal after sampling for  
1)  $F_s = 200 \text{ Hz}$  & 2)  $F_s = 75 \text{ Hz}$
- 2) Find Fourier series coefficient using trigonometric Fourier series method for Full wave rectified signal with fundamental frequency  $\omega_0 = \pi$
- 3) State and prove any two properties of Laplace transform.

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Max. Marks: 70

Marks: 14

14

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- Page 1 of 16

- 7) What is the type of the closed loop system for the plant transfer function  $G(S) = \frac{kS}{s^3(1+5S)}$ 
  - a) 2
  - b) 1
  - c) 3
  - d) 0
- 8) If the system is specified by open loop transfer function  $G(s)H(s) = \frac{K}{s(s+4)(s+6)}$ , how many root loci proceed to end at infinity?
  - a) 2
  - b) 3
  - c) 5
  - d) 6
- 9) The compensator required to improve the steady state response of system is \_\_\_\_\_
  - a) Lead
  - b) Lag
  - c) Lag-Lead
  - d) None of these
- 10) Bandwidth is increased when compensator used is \_\_\_\_\_
  - a) Lead
  - b) Lag
  - c) Lag-Lead
  - d) None of these
- 11) The phase crossover frequency  $|G(j\omega)H(j\omega)| =$  \_\_\_\_\_
  - a)  $0^\circ$
  - b)  $180^\circ$
  - c)  $-90^\circ$
  - d)  $-180^\circ$
- 12) If the system has nonrepeated pole on the  $j\omega$  axis, the system is \_\_\_\_\_
  - a) stable
  - b) unstable
  - c) marginally stable
  - d) conditionally unstable
- 13) The gain margin of a system is 0dB. It represents a \_\_\_\_\_.
  - a) stable system
  - b) unstable system
  - c) marginally stable systems
  - d) conditionally stable system
- 14) The polar plot of a transfer function passes through the critical point  $(-1,0)$ . Gain margin is \_\_\_\_\_
  - a) Zero
  - b) -1dB
  - c) 1dB
  - d) Infinity

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Control Systems**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

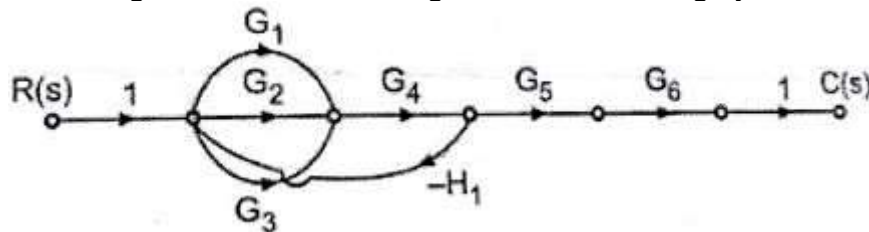
- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

**Q.2 Attempt any four.**

16

- a) Using Masons gain formula find the gain of the following system.

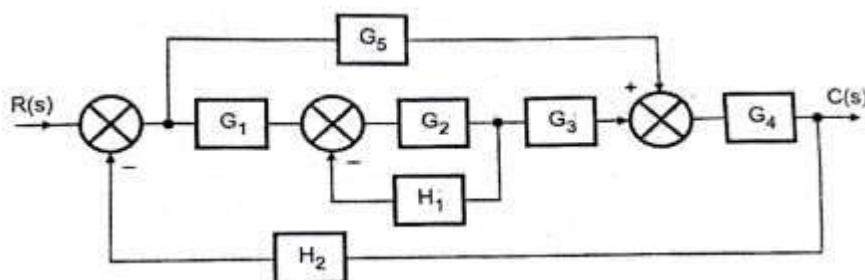


- b) Define closed loop control system. Prove that  $\frac{C(s)}{R(s)} = \frac{G(s)}{1+G(s)H(s)}$
- c) Describe construction and working of permanent magnet stepper motor.
- d) A unity feedback control system has  $G(s) = \frac{40(s+2)}{s(s+1)(s+4)}$  Determine
- 1) Type of system
  - 2) All error coefficients
- e) Analyze Type 0, Type 1 & Type 2 system for step input.

**Q.3 Solve any two.**

12

- 1) Obtain transfer function for the given system by using block diagram reduction.



- 2) Derive transfer function of armature controlled D.C servomotor.
- 3) Derive the expressions for first order system for unit step input.

## Section – II

## Q.4 Attempt any four.

16

- a) What do you mean by proportional integral controller? Elaborate its effect on system performance.
- b) Consider characteristics equation  $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$ . Determine stability using Routh's criterion.
- c) Explain nature of Bode plot for
  - 1) Simple gain 'K'
  - 2) Simple poles (first order factor)
- d) Explain frequency domain specifications.
- e) What do you mean by a polar plot? Draw polar plot for Type two system.

## Q.5 Attempt any two:

12

- 1) A feedback system has  $G(s)H(s) = \frac{200(s+1)}{s^2(s+10)(s+40)}$ . Sketch the Bode plot and comment on stability.
- 2) For unity feedback system  $G(s) = \frac{K}{s(s+3)(s+1)}$  Sketch nature root locus and comment on stability.
- 3) What is compensator? Derive transfer function of lag compensator and also explain its polar plot.

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Max. Marks: 70

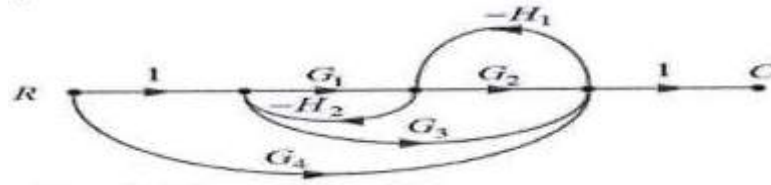
Marks: 14

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- 9) The \_\_\_\_\_ number of forward paths and number of loops \_\_\_\_\_ are present in given SFG.



- a) 2, 2  
b) 2, 3  
c) 3, 2  
d) 3, 3
- 10) Three blocks with gain of 4, 6 and 8 are connected in parallel. The total gain of arrangement is \_\_\_\_\_.  
a) 18  
b) 196  
c) 32  
d) 52
- 11) A synchro pair consists of a \_\_\_\_\_ and a \_\_\_\_\_.  
a) Synchro transmitter & synchro control transformer  
b) transmitter & receiver  
c) transformer & detector  
d) transducer & receiver
- 12) One of the basic requirements of a servomotor is that it must produce high torque at all \_\_\_\_\_.  
a) Loads  
b) Frequencies  
c) Speeds  
d) Voltages
- 13) If for second order system damping factor is less than one, then system response will be \_\_\_\_\_.  
a) Under damped  
b) Over damped  
c) Critically damped  
d) None of these
- 14) What is the type of the closed loop system for the plant transfer function  $G(S) = \frac{k S}{s^3(1+5S)}$   
a) 2  
b) 1  
c) 3  
d) 0

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Control Systems**

Day & Date: Wednesday, 08-03-2023  
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Max. Marks: 56

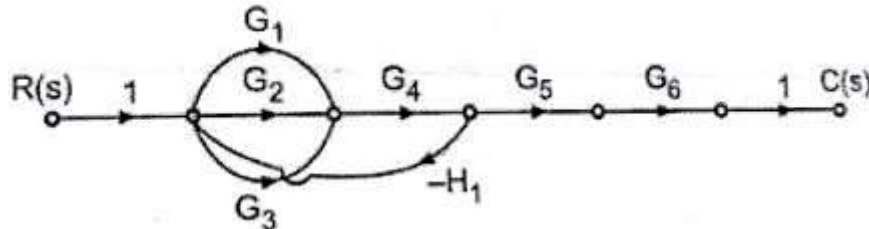
- Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any four.**

16

- a) Using Masons gain formula find the gain of the following system.

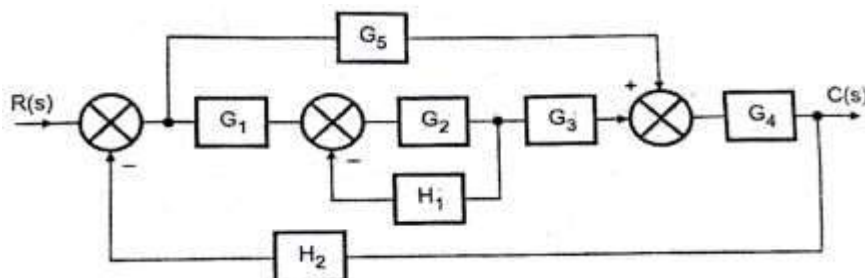


- b) Define closed loop control system. Prove that  $\frac{C(s)}{R(s)} = \frac{G(s)}{1 \pm G(s)H(s)}$
- c) Describe construction and working of permanent magnet stepper motor.
- d) A unity feedback control system has  $G(S) = \frac{40(s+2)}{s(s+1)(s+4)}$  Determine
- 1) Type of system
  - 2) All error coefficients
- e) Analyze Type 0, Type 1 & Type 2 system for step input.

**Q.3 Solve any two.**

12

- 1) Obtain transfer function for the given system by using block diagram reduction.



- 2) Derive transfer function of armature controlled D.C servomotor.
- 3) Derive the expressions for first order system for unit step input.

## Section – II

**Q.4 Attempt any four.****16**

- a) What do you mean by proportional integral controller? Elaborate its effect on system performance.
- b) Consider characteristics equation  $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$ . Determine stability using Routh's criterion.
- c) Explain nature of Bode plot for
  - 1) Simple gain 'K'
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- d) Explain frequency domain specifications.
- e) What do you mean by a polar plot? Draw polar plot for Type two system.

**Q.5 Attempt any two:****12**

- 1) A feedback system has  $G(s)H(s) = \frac{200(s+1)}{s^2(s+10)(s+40)}$ . Sketch the Bode plot and comment on stability.
- 2) For unity feedback system  $G(s) = \frac{K}{s(s+3)(s+1)}$  Sketch nature root locus and comment on stability.
- 3) What is compensator? Derive transfer function of lag compensator and also explain its polar plot.

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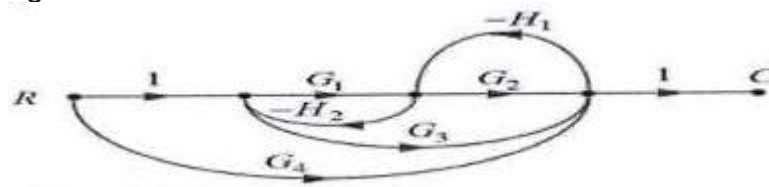
Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full mark

Marks: 14

14

- The phase crossover frequency  $|G(j\omega)H(j\omega)| = \underline{\hspace{2cm}}$ 
  - $0^\circ$
  - $180^\circ$
  - $-90^\circ$
  - $-180^\circ$
- If the system has nonrepeated pole on the  $j\omega$  axis, the system is \_\_\_\_\_.
  - stable
  - unstable
  - marginally stable
  - conditionally unstable
- The gain margin of a system is 0dB. It represents a \_\_\_\_\_.
  - stable system
  - unstable system
  - marginally stable systems
  - conditionally stable system
- The polar plot of a transfer function passes through the critical point (-1,0). Gain margin is \_\_\_\_\_.
  - Zero
  - 1dB
  - 1dB
  - Infinity
- The path from source node to sink node in SFG is called as \_\_\_\_\_.
  - Forward loops
  - Forward path
  - Forward path gain
  - None of these
- The \_\_\_\_\_ number of forward paths and number of loops \_\_\_\_\_ are present in given SFG.



- a) 2, 2                      b) 2, 3  
c) 3, 2                      d) 3, 3
- 7) Three blocks with gain of 4, 6 and 8 are connected in parallel. The total gain of arrangement is \_\_\_\_\_  
a) 18                          b) 196  
c) 32                          d) 52

- 8) A synchro pair consists of a \_\_\_\_\_ and a \_\_\_\_\_.  
 a) Synchro transmitter & synchro control transformer  
 b) transmitter & receiver  
 c) transformer & detector  
 d) transducer & receiver
- 9) One of the basic requirements of a servomotor is that it must produce high torque at all \_\_\_\_\_.  
 a) Loads  
 b) Frequencies  
 c) Speeds  
 d) Voltages
- 10) If for second order system damping factor is less than one, then system response will be \_\_\_\_\_.  
 a) Under damped  
 b) Over damped  
 c) Critically damped  
 d) None of these
- 11) What is the type of the closed loop system for the plant transfer function  

$$G(S) = \frac{k S}{s^3(1+5S)}$$
  
 a) 2  
 b) 1  
 c) 3  
 d) 0
- 12) If the system is specified by open loop transfer function  

$$G(s)H(s) = \frac{K}{s(s+4)(s+6)}$$
, how many root loci proceed to end at infinity?  
 a) 2  
 b) 3  
 c) 5  
 d) 6
- 13) The compensator required to improve the steady state response of system is \_\_\_\_\_.  
 a) Lead  
 b) Lag  
 c) Lag-Lead  
 d) None of these
- 14) Bandwidth is increased when compensator used is \_\_\_\_\_.  
 a) Lead  
 b) Lag  
 c) Lag-Lead  
 d) None of these

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Set **R**

**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Control Systems**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

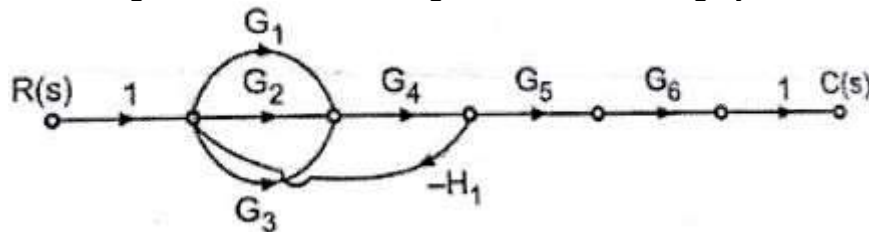
- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

**Q.2 Attempt any four.**

16

- a) Using Masons gain formula find the gain of the following system.

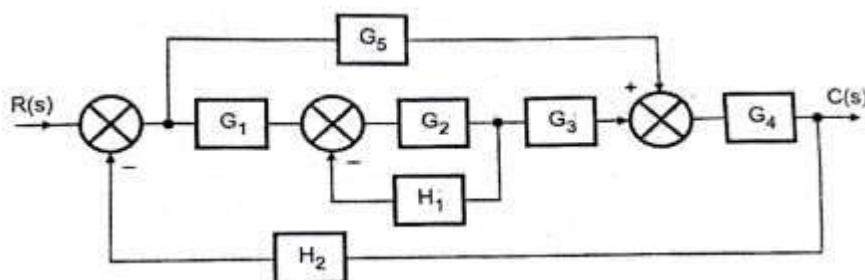


- b) Define closed loop control system. Prove that  $\frac{C(s)}{R(s)} = \frac{G(s)}{1+G(s)H(s)}$
- c) Describe construction and working of permanent magnet stepper motor.
- d) A unity feedback control system has  $G(s) = \frac{40(s+2)}{s(s+1)(s+4)}$  Determine
- 1) Type of system
  - 2) All error coefficients
- e) Analyze Type 0, Type 1 & Type 2 system for step input.

**Q.3 Solve any two.**

12

- 1) Obtain transfer function for the given system by using block diagram reduction.



- 2) Derive transfer function of armature controlled D.C servomotor.
- 3) Derive the expressions for first order system for unit step input.

## Section – II

**Q.4 Attempt any four.****16**

- a) What do you mean by proportional integral controller? Elaborate its effect on system performance.
- b) Consider characteristics equation  $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$ . Determine stability using Routh's criterion.
- c) Explain nature of Bode plot for
  - 1) Simple gain 'K'
  - 2) Simple poles (first order factor)
- d) Explain frequency domain specifications.
- e) What do you mean by a polar plot? Draw polar plot for Type two system.

**Q.5 Attempt any two:****12**

- 1) A feedback system has  $G(s)H(s) = \frac{200(s+1)}{s^2(s+10)(s+40)}$ . Sketch the Bode plot and comment on stability.
- 2) For unity feedback system  $G(s) = \frac{K}{s(s+3)(s+1)}$  Sketch nature root locus and comment on stability.
- 3) What is compensator? Derive transfer function of lag compensator and also explain its polar plot.

# S





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Set **S**

**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Control Systems**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

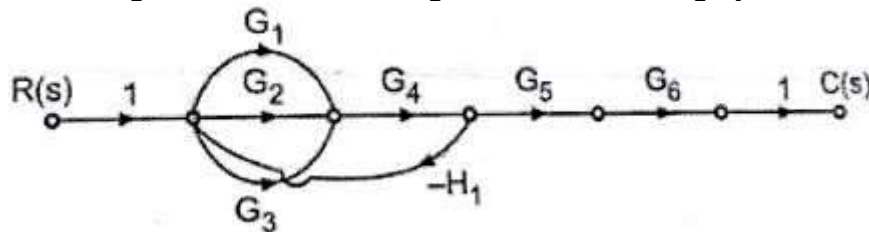
- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
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**Section – I**

**Q.2 Attempt any four.**

16

- a) Using Masons gain formula find the gain of the following system.

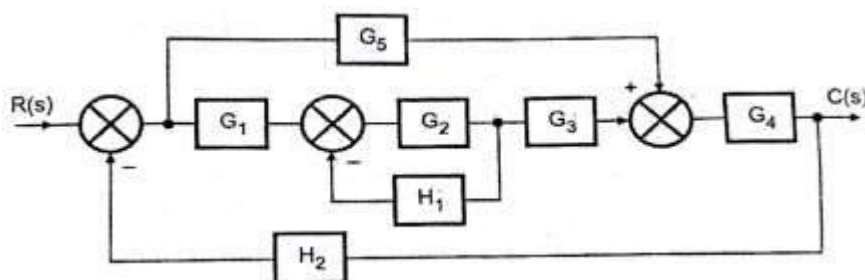


- b) Define closed loop control system. Prove that  $\frac{C(s)}{R(s)} = \frac{G(s)}{1+G(s)H(s)}$
- c) Describe construction and working of permanent magnet stepper motor.
- d) A unity feedback control system has  $G(s) = \frac{40(s+2)}{s(s+1)(s+4)}$  Determine
- 1) Type of system
  - 2) All error coefficients
- e) Analyze Type 0, Type 1 & Type 2 system for step input.

**Q.3 Solve any two.**

12

- 1) Obtain transfer function for the given system by using block diagram reduction.



- 2) Derive transfer function of armature controlled D.C servomotor.
- 3) Derive the expressions for first order system for unit step input.

## Section – II

**Q.4 Attempt any four.****16**

- a) What do you mean by proportional integral controller? Elaborate its effect on system performance.
- b) Consider characteristics equation  $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$ . Determine stability using Routh's criterion.
- c) Explain nature of Bode plot for
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- d) Explain frequency domain specifications.
- e) What do you mean by a polar plot? Draw polar plot for Type two system.

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- 1) A feedback system has  $G(s)H(s) = \frac{200(s+1)}{s^2(s+10)(s+40)}$ . Sketch the Bode plot and comment on stability.
- 2) For unity feedback system  $G(s) = \frac{K}{s(s+3)(s+1)}$  Sketch nature root locus and comment on stability.
- 3) What is compensator? Derive transfer function of lag compensator and also explain its polar plot.

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Data Structures and Algorithms**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What will be the value of top, if there is size of stack STACK\_SIZE is 5?
  - a) 5
  - b) 6
  - c) 4
  - d) None
- 2) Stack is called as \_\_\_\_\_.
  - a) Last in first out
  - b) First in last out
  - c) Last in last out
  - d) First in first out
- 3) Identify the data structure which allows deletions at both ends of the list but insertion at only one end.
  - a) Input restricted dequeue
  - b) Output restricted dequeue
  - c) Priority queues
  - d) Stack
- 4) A \_\_\_\_\_ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.
  - a) Queue linked list
  - b) Stack linked list
  - c) Both of them
  - d) Neither of them
- 5) Recursion is similar to which of the following?
  - a) Switch Case
  - b) Loop
  - c) If-else
  - d) None
- 6) In recursion the condition after which the function will stop calling itself is \_\_\_\_\_.
  - a) Base condition
  - b) Function call
  - c) Both a and b
  - d) None
- 7) Head node is used in \_\_\_\_\_.
  - a) Graphs
  - b) Stacks
  - c) Linked list
  - d) Queues
- 8) Which of the following indicates pre-order traversal?
  - a) Left sub-tree, Right sub-tree and root
  - b) Right sub-tree, Left sub-tree and root
  - c) Root, Left sub-tree, Right sub-tree
  - d) Right sub-tree, root, Left sub-tree

- 9) The number of binary trees with 3 nodes which when traversed in post order gives the sequence A,B,C is ?
  - a) 3
  - b) 9
  - c) 7
  - d) 5
- 10) What is the hash function used in the division method?
  - a)  $h(k) = k/m$
  - b)  $h(k) = k \bmod m$
  - c)  $h(k) = m/k$
  - d)  $h(k) = m \bmod k$
- 11) Which of the following is a disadvantage of linear search?
  - a) Requires more space
  - b) Greater time complexities compared to other searching algorithms
  - c) Not easy to understand
  - d) Not easy to implement
- 12) In the following scenarios, when will you use selection sort?
  - a) The input is already sorted
  - b) A large file has to be sorted
  - c) Large values need to be sorted with small keys
  - d) Small values need to be sorted with large keys
- 13) Which of the following properties does a simple graph not hold?
  - a) Must be connected
  - b) Must be unweighted
  - c) Must have no loops
  - d) Must have no multiple edges
- 14) What is the maximum possible number of edges in a directed graph with no self loops having 8 vertices?
  - a) 28
  - b) 64
  - c) 256
  - d) 56

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Data Structures and Algorithms**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) Write and explain an algorithm to evaluate a postfix expression.
- b) Write a 'C' program to find the fibonacci sequence using recursive functions
- c) Differentiate between Singly linked list and Circular linked list.
- d) Draw the recursive flowchart. Write the general algorithm for recursion.
- e) Define queue. Explain the different types of queues with suitable diagram.

**Q.3 Attempt any two.** **12**

- a) Write a 'C' program to implement following operations on a stack
  - 1) Push
  - 2) Pop
  - 3) Display
- b) Define Doubly linked list and state its advantages and disadvantages
- c) Write a 'C' program to implement following operations on a simple queue.
  - 1) Enqueue
  - 2) Dequeue
  - 3) Display

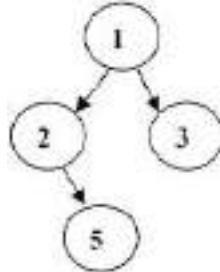
**Section – II**

**Q.4 Answer any four questions.** **16**

- a) Define the following terms of a graph
  - 1) Loop
  - 2) Weighted graph
  - 3) Isolated node
  - 4) Simple graph
- b) Write a C program to implement insertion sort method
- c) Create a binary search tree from the following keys:  
55, 32, 62, 38, 35, 51, 22, 59, 95, 13, 98
- d) Explain the binary search method to search an element in an array with an example.
- e) Define hashing. Explain the following hash functions with example.
  - 1) Division Method
  - 2) Digit Analysis

**Q.5 Answer any two questions.**

- a) What are the different methods to represent a graph? Explain any one method with example for representation of a graph
- b) What is hash collision? Explain closed addressing technique in detail
- c) Explain the different tree traversal methods with example. Find all the three traversal order for following binary search tree.



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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Data Structures and Algorithms**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following indicates pre-order traversal?
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  - b) Right sub-tree, Left sub-tree and root
  - c) Root, Left sub-tree, Right sub-tree
  - d) Right sub-tree, root, Left sub-tree
- 2) The number of binary trees with 3 nodes which when traversed in post order gives the sequence A,B,C is ?
 

|      |      |
|------|------|
| a) 3 | b) 9 |
| c) 7 | d) 5 |
- 3) What is the hash function used in the division method?
 

|                 |                       |
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| a) $h(k) = k/m$ | b) $h(k) = k \bmod m$ |
| c) $h(k) = m/k$ | d) $h(k) = m \bmod k$ |
- 4) Which of the following is a disadvantage of linear search?
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- 5) In the following scenarios, when will you use selection sort?
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|        |       |
|--------|-------|
| a) 28  | b) 64 |
| c) 256 | d) 56 |



- 8) What will be the value of top, if there is size of stack STACK\_SIZE is 5?  
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b) 6  
c) 4  
d) None
- 9) Stack is called as \_\_\_\_\_.  
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- 13) In recursion the condition after which the function will stop calling itself is \_\_\_\_\_.  
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a) Graphs  
b) Stacks  
c) Linked list  
d) Queues

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Data Structures and Algorithms**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) Write and explain an algorithm to evaluate a postfix expression.
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- c) Differentiate between Singly linked list and Circular linked list.
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**Q.3 Attempt any two.** **12**

- a) Write a 'C' program to implement following operations on a stack
  - 1) Push
  - 2) Pop
  - 3) Display
- b) Define Doubly linked list and state its advantages and disadvantages
- c) Write a 'C' program to implement following operations on a simple queue.
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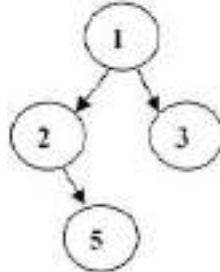
**Section – II**

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**Q.5 Answer any two questions.**

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Data Structures and Algorithms**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

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- 1) Which of the following is a disadvantage of linear search?
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|      |         |
|------|---------|
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|----------------------|-----------------------|
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- 7) Identify the data structure which allows deletions at both ends of the list but insertion at only one end.
 

|                             |                              |
|-----------------------------|------------------------------|
| a) Input restricted dequeue | b) Output restricted dequeue |
| c) Priority queues          | d) Stack                     |

- 8) A \_\_\_\_\_ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.
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c)  $h(k) = m/k$                               d)  $h(k) = m \bmod k$

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Data Structures and Algorithms**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any four.** **16**

- a) Write and explain an algorithm to evaluate a postfix expression.
- b) Write a 'C' program to find the fibonacci sequence using recursive functions
- c) Differentiate between Singly linked list and Circular linked list.
- d) Draw the recursive flowchart. Write the general algorithm for recursion.
- e) Define queue. Explain the different types of queues with suitable diagram.

**Q.3 Attempt any two.** **12**

- a) Write a 'C' program to implement following operations on a stack
  - 1) Push
  - 2) Pop
  - 3) Display
- b) Define Doubly linked list and state its advantages and disadvantages
- c) Write a 'C' program to implement following operations on a simple queue.
  - 1) Enqueue
  - 2) Dequeue
  - 3) Display

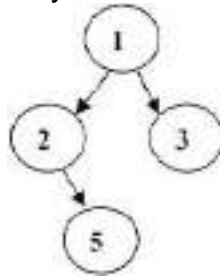
**Section – II**

**Q.4 Answer any four questions.** **16**

- a) Define the following terms of a graph
  - 1) Loop
  - 2) Weighted graph
  - 3) Isolated node
  - 4) Simple graph
- b) Write a C program to implement insertion sort method
- c) Create a binary search tree from the following keys:  
55, 32, 62, 38, 35, 51, 22, 59, 95, 13, 98
- d) Explain the binary search method to search an element in an array with an example.
- e) Define hashing. Explain the following hash functions with example.
  - 1) Division Method
  - 2) Digit Analysis

**Q.5 Answer any two questions.**

- a) What are the different methods to represent a graph? Explain any one method with example for representation of a graph
- b) What is hash collision? Explain closed addressing technique in detail
- c) Explain the different tree traversal methods with example. Find all the three traversal order for following binary search tree.



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Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- Page 13 of 16



- 8) Which of the following properties does a simple graph not hold?
- a) Must be connected
  - b) Must be unweighted
  - c) Must have no loops
  - d) Must have no multiple edges
- 9) What is the maximum possible number of edges in a directed graph with no self loops having 8 vertices?
- a) 28
  - b) 64
  - c) 256
  - d) 56
- 10) What will be the value of top, if there is size of stack STACK\_SIZE is 5?
- a) 5
  - b) 6
  - c) 4
  - d) None
- 11) Stack is called as \_\_\_\_.
- a) Last in first out
  - b) First in last out
  - c) Last in last out
  - d) First in first out
- 12) Identify the data structure which allows deletions at both ends of the list but insertion at only one end.
- a) Input restricted dequeue
  - b) Output restricted dequeue
  - c) Priority queues
  - d) Stack
- 13) A \_\_\_\_\_ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.
- a) Queue linked list
  - b) Stack linked list
  - c) Both of them
  - d) Neither of them
- 14) Recursion is similar to which of the following?
- a) Switch Case
  - b) Loop
  - c) If-else
  - d) None

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Data Structures and Algorithms**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- a) Write and explain an algorithm to evaluate a postfix expression.
- b) Write a 'C' program to find the fibonacci sequence using recursive functions
- c) Differentiate between Singly linked list and Circular linked list.
- d) Draw the recursive flowchart. Write the general algorithm for recursion.
- e) Define queue. Explain the different types of queues with suitable diagram.

**Q.3 Attempt any two.** **12**

- a) Write a 'C' program to implement following operations on a stack
  - 1) Push
  - 2) Pop
  - 3) Display
- b) Define Doubly linked list and state its advantages and disadvantages
- c) Write a 'C' program to implement following operations on a simple queue.
  - 1) Enqueue
  - 2) Dequeue
  - 3) Display

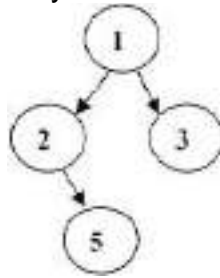
**Section – II**

**Q.4 Answer any four questions.** **16**

- a) Define the following terms of a graph
  - 1) Loop
  - 2) Weighted graph
  - 3) Isolated node
  - 4) Simple graph
- b) Write a C program to implement insertion sort method
- c) Create a binary search tree from the following keys:  
55, 32, 62, 38, 35, 51, 22, 59, 95, 13, 98
- d) Explain the binary search method to search an element in an array with an example.
- e) Define hashing. Explain the following hash functions with example.
  - 1) Division Method
  - 2) Digit Analysis

**Q.5 Answer any two questions.**

- a) What are the different methods to represent a graph? Explain any one method with example for representation of a graph
- b) What is hash collision? Explain closed addressing technique in detail
- c) Explain the different tree traversal methods with example. Find all the three traversal order for following binary search tree.



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A practical integrator has an additional \_\_\_\_\_ than ideal integrator.
  - a) resistor
  - b) capacitor
  - c) resistor and capacitor
  - d) two resistors
- 2) Output voltage swing indicates the values of \_\_\_\_\_ voltage output of the op amp.
  - a) saturation
  - b) supply
  - c) slew rate
  - d) all of these
- 3) A typical narrow band reject filter consists of two \_\_\_\_\_.
  - a) sections
  - b) T network
  - c) op amps
  - d) all of these
- 4) Transient response of an op amp is characterized by \_\_\_\_\_.
  - a) steady state, overshoot
  - b) overshoot, rise time
  - c) steady state, rise time
  - d) steady state, slew rate
- 5) Make odd man out: input offset current, input offset voltage, thermal drift, CMRR \_\_\_\_\_.
  - a) input offset current
  - b) input offset voltage
  - c) thermal drift
  - d) CMRR
- 6) For a Wein Bridge oscillator, the gain required for sustained oscillations is \_\_\_\_\_.
  - a) 1
  - b) 1.59
  - c) 2
  - d) 3
- 7) Take odd man out: square wave generator, free running multivibrator, astable multivibrator, bistable multivibrator \_\_\_\_\_.
  - a) square wave generator
  - b) free running multivibrator
  - c) astable multivibrator
  - d) bistable multivibrator
- 8) \_\_\_\_\_ is the slowest of all ADCs.
  - a) Flash
  - b) Successive approximation
  - c) Single slope
  - d) Dual slope

- 9) A temperature of milk tank need to be controlled. Which of below is required?
- a) ADC
  - b) sample and hold
  - c) transducer
  - d) all of these
- 10) A clamper is also called as \_\_\_\_\_.  
a) reference voltage circuit      b) dc inserter  
c) peak clipper      d) all of these
- 11) A high frequency and low frequency op mp equivalent circuits differs with \_\_\_\_\_.  
a) input resistance      b) gain  
c) output resistance      d) equivalent capacitance
- 12) A notch filter is a \_\_\_\_\_ filter.  
a) wide band stop      b) wide band pass  
c) narrow band stop      d) narrow band pass
- 13) \_\_\_\_\_ is a an open loop application of op amp.  
a) window detector      b) voltage follower  
c) I to V converter      d) V to I converter
- 14) When signals need to travel over long distance in noisy environment, one can use \_\_\_\_\_ amplifier.  
a) differential      b) log  
c) all pass      d) unity gain

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer the following questions. (Any Two)** **12**

- Derive an equation for closed loop voltage gain ( $A_F$ ) for non inverting amplifier for ideal & exact case. Also derive equation for closed loop voltage gain and loop gain ( $A\beta$ )
- Prove - when negative feedback is applied to a non inverting amplifier, its input resistance increases.
- Derive an expression for a closed loop gain of an op amp as a function of frequency.

**Q.3 Solve Any Four** **16**

- Draw and explain completely compensated inverting amplifier.
- Derive an expression for output of an integrator.
- What is loading effect? How op amp can be used to avoid it?
- $V_1, V_2, V_3$  &  $V_o$  are analog voltages. Show how op amp can be used to obtain  $V_o$  where  $V_o = V_1 + V_2 + V_3$
- Compare ideal and practical op amp.

**Section – II**

**Q.4 Solve Any Two** **12**

- Design a circuit: input is 8 bit binary number, output is proportional voltage between 0V to 5V.
- Design a circuit which through different color LEDs give indication about voltage range of an unknown input voltage. Assume suitable voltage ranges.
- Design a circuit which samples and holds an input waveform.

**Q.5 Solve Any Four** **16**

- Show how op amp can be used for notch filter.
- Discuss advantages and disadvantages of active filters over passive filters.
- Evaluate any four specifications of ADC.
- Discuss Schmitt trigger and its applications.
- What are oscillator types? Discuss with the context of components used, frequency, applications and types of waveforms.

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is the slowest of all ADCs.
  - a) Flash
  - b) Successive approximation
  - c) Single slope
  - d) Dual slope
- 2) A temperature of milk tank need to be controlled. Which of below is required?
  - a) ADC
  - b) sample and hold
  - c) transducer
  - d) all of these
- 3) A clamper is also called as \_\_\_\_\_.
  - a) reference voltage circuit
  - b) dc inserter
  - c) peak clipper
  - d) all of these
- 4) A high frequency and low frequency op mp equivalent circuits differs with \_\_\_\_\_.
  - a) input resistance
  - b) gain
  - c) output resistance
  - d) equivalent capacitance
- 5) A notch filter is a \_\_\_\_\_ filter.
  - a) wide band stop
  - b) wide band pass
  - c) narrow band stop
  - d) narrow band pass
- 6) \_\_\_\_\_ is a an open loop application of op amp.
  - a) window detector
  - b) voltage follower
  - c) I to V converter
  - d) V to I converter
- 7) When signals need to travel over long distance in noisy environment, one can use \_\_\_\_\_ amplifier.
  - a) differential
  - b) log
  - c) all pass
  - d) unity gain
- 8) A practical integrator has an additional \_\_\_\_\_ than ideal integrator.
  - a) resistor
  - b) capacitor
  - c) resistor and capacitor
  - d) two resistors
- 9) Output voltage swing indicates the values of \_\_\_\_\_ voltage output of the op amp.
  - a) saturation
  - b) supply
  - c) slew rate
  - d) all of these





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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
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**Section – I**

**Q.2 Answer the following questions. (Any Two)** **12**

- a) Derive an equation for closed loop voltage gain ( $A_F$ ) for non inverting amplifier for ideal & exact case. Also derive equation for closed loop voltage gain and loop gain ( $A\beta$ )
- b) Prove - when negative feedback is applied to a non inverting amplifier, its input resistance increases.
- c) Derive an expression for a closed loop gain of an op amp as a function of frequency.

**Q.3 Solve Any Four** **16**

- a) Draw and explain completely compensated inverting amplifier.
- b) Derive an expression for output of an integrator.
- c) What is loading effect? How op amp can be used to avoid it?
- d)  $V_1, V_2, V_3$  &  $V_o$  are analog voltages. Show how op amp can be used to obtain  $V_o$  where  $V_o = V_1 + V_2 + V_3$
- e) Compare ideal and practical op amp.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) Design a circuit: input is 8 bit binary number, output is proportional voltage between 0V to 5V.
- b) Design a circuit which through different color LEDs give indication about voltage range of an unknown input voltage. Assume suitable voltage ranges.
- c) Design a circuit which samples and holds an input waveform.

**Q.5 Solve Any Four** **16**

- a) Show how op amp can be used for notch filter.
- b) Discuss advantages and disadvantages of active filters over passive filters.
- c) Evaluate any four specifications of ADC.
- d) Discuss Schmitt trigger and its applications.
- e) What are oscillator types? Discuss with the context of components used, frequency, applications and types of waveforms.

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

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### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) A high frequency and low frequency op mp equivalent circuits differs with \_\_\_\_\_.  
a) input resistance  
b) gain  
c) output resistance  
d) equivalent capacitance
- 2) A notch filter is a \_\_\_\_\_ filter.  
a) wide band stop  
b) wide band pass  
c) narrow band stop  
d) narrow band pass
- 3) \_\_\_\_\_ is a an open loop application of op amp.  
a) window detector  
b) voltage follower  
c) I to V converter  
d) V to I converter
- 4) When signals need to travel over long distance in noisy environment, one can use \_\_\_\_\_ amplifier.  
a) differential  
b) log  
c) all pass  
d) unity gain
- 5) A practical integrator has an additional \_\_\_\_\_ than ideal integrator.  
a) resistor  
b) capacitor  
c) resistor and capacitor  
d) two resistors
- 6) Output voltage swing indicates the values of \_\_\_\_\_ voltage output of the op amp.  
a) saturation  
b) supply  
c) slew rate  
d) all of these
- 7) A typical narrow band reject filter consists of two \_\_\_\_\_.  
a) sections  
b) T network  
c) op amps  
d) all of these
- 8) Transient response of an op amp is characterized by \_\_\_\_\_.  
a) steady state, overshoot  
b) overshoot, rise time  
c) steady state, rise time  
d) steady state, slew rate

- 9) Make odd man out: input offset current, input offset voltage, thermal drift, CMRR \_\_\_\_\_.  
a) input offset current                      b) input offset voltage  
c) thermal drift                                d) CMRR
- 10) For a Wein Bridge oscillator, the gain required for sustained oscillations is \_\_\_\_\_.  
a) 1                                                b) 1.59  
c) 2                                                d) 3
- 11) Take odd man out: square wave generator, free running multivibrator, astable multivibrator, bistable multivibrator \_\_\_\_\_.  
a) square wave generator                      b) free running multivibrator  
c) astable multivibrator                        d) bistable multivibrator
- 12) \_\_\_\_\_ is the slowest of all ADCs.  
a) Flash                                            b) Successive approximation  
c) Single slope                                   d) Dual slope
- 13) A temperature of milk tank need to be controlled. Which of below is required?  
a) ADC                                              b) sample and hold  
c) transducer                                    d) all of these
- 14) A clamper is also called as \_\_\_\_\_.  
a) reference voltage circuit                      b) dc inserter  
c) peak clipper                                    d) all of these

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer the following questions. (Any Two)** **12**

- a) Derive an equation for closed loop voltage gain ( $A_F$ ) for non inverting amplifier for ideal & exact case. Also derive equation for closed loop voltage gain and loop gain ( $A\beta$ )
- b) Prove - when negative feedback is applied to a non inverting amplifier, its input resistance increases.
- c) Derive an expression for a closed loop gain of an op amp as a function of frequency.

**Q.3 Solve Any Four** **16**

- a) Draw and explain completely compensated inverting amplifier.
- b) Derive an expression for output of an integrator.
- c) What is loading effect? How op amp can be used to avoid it?
- d)  $V_1, V_2, V_3$  &  $V_o$  are analog voltages. Show how op amp can be used to obtain  $V_o$  where  $V_o = V_1 + V_2 + V_3$
- e) Compare ideal and practical op amp.

**Section – II**

**Q.4 Solve Any Two** **12**

- a) Design a circuit: input is 8 bit binary number, output is proportional voltage between 0V to 5V.
- b) Design a circuit which through different color LEDs give indication about voltage range of an unknown input voltage. Assume suitable voltage ranges.
- c) Design a circuit which samples and holds an input waveform.

**Q.5 Solve Any Four** **16**

- a) Show how op amp can be used for notch filter.
- b) Discuss advantages and disadvantages of active filters over passive filters.
- c) Evaluate any four specifications of ADC.
- d) Discuss Schmitt trigger and its applications.
- e) What are oscillator types? Discuss with the context of components used, frequency, applications and types of waveforms.

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Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks: 14

14

- Page 10 of 12

- 9) When signals need to travel over long distance in noisy environment, one can use \_\_\_\_\_ amplifier.
- |                 |               |
|-----------------|---------------|
| a) differential | b) log        |
| c) all pass     | d) unity gain |
- 10) A practical integrator has an additional \_\_\_\_\_ than ideal integrator.
- |                           |                  |
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| a) resistor               | b) capacitor     |
| c) resistor and capacitor | d) two resistors |
- 11) Output voltage swing indicates the values of \_\_\_\_\_ voltage output of the op amp.
- |               |                 |
|---------------|-----------------|
| a) saturation | b) supply       |
| c) slew rate  | d) all of these |
- 12) A typical narrow band reject filter consists of two \_\_\_\_\_.
- |             |                 |
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| a) sections | b) T network    |
| c) op amps  | d) all of these |
- 13) Transient response of an op amp is characterized by \_\_\_\_\_.
- |                            |                            |
|----------------------------|----------------------------|
| a) steady state, overshoot | b) overshoot, rise time    |
| c) steady state, rise time | d) steady state, slew rate |
- 14) Make odd man out: input offset current, input offset voltage, thermal drift, CMRR \_\_\_\_\_.
- |                         |                         |
|-------------------------|-------------------------|
| a) input offset current | b) input offset voltage |
| c) thermal drift        | d) CMRR                 |

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer the following questions. (Any Two)** **12**

- Derive an equation for closed loop voltage gain ( $A_F$ ) for non inverting amplifier for ideal & exact case. Also derive equation for closed loop voltage gain and loop gain ( $A\beta$ )
- Prove - when negative feedback is applied to a non inverting amplifier, its input resistance increases.
- Derive an expression for a closed loop gain of an op amp as a function of frequency.

**Q.3 Solve Any Four** **16**

- Draw and explain completely compensated inverting amplifier.
- Derive an expression for output of an integrator.
- What is loading effect? How op amp can be used to avoid it?
- $V_1, V_2, V_3$  &  $V_o$  are analog voltages. Show how op amp can be used to obtain  $V_o$  where  $V_o = V_1 + V_2 + V_3$
- Compare ideal and practical op amp.

**Section – II**

**Q.4 Solve Any Two** **12**

- Design a circuit: input is 8 bit binary number, output is proportional voltage between 0V to 5V.
- Design a circuit which through different color LEDs give indication about voltage range of an unknown input voltage. Assume suitable voltage ranges.
- Design a circuit which samples and holds an input waveform.

**Q.5 Solve Any Four** **16**

- Show how op amp can be used for notch filter.
- Discuss advantages and disadvantages of active filters over passive filters.
- Evaluate any four specifications of ADC.
- Discuss Schmitt trigger and its applications.
- What are oscillator types? Discuss with the context of components used, frequency, applications and types of waveforms.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- 1) In a low level amplitude modulation system, the amplifier following the modulated stage must be \_\_\_\_\_.  
a) Linear device  
b) Non Linear device  
c) harmonics device  
d) Class C amplifier
- 2) Thermal noise voltage in a resistor R is given by \_\_\_\_\_.  
a)  $\sqrt{4RkTB}$   
b)  $kTB$   
c)  $TBk^2$   
d) None
- 3) In an amplitude modulated waveform the amplitude of side bands is \_\_\_\_\_.  
a) Independent of the carrier amplitude  
b) Independent of the modulation index  
c) carrier amplitude x modulation index  
d) 1/2 carrier amplitude x modulation index
- 4) Noise power at the resistor is affected by the value of the resistor as \_\_\_\_\_.  
a) Directly proportional to the value of the resistor  
b) Inversely proportional to the value of the resistor  
c) Unaffected by the value of the resistor  
d) Becomes half as the resistance value is doubled
- 5) The relation between carrier power and total power in an AM wave is \_\_\_\_\_.  
a)  $P_C = P_T \left(1 + \frac{m^2}{4}\right)$   
b)  $P_C = P_T \left(1 + \frac{m^2}{2}\right)$   
c)  $P_T = P_C \left(1 + \frac{m^2}{4}\right)$   
d)  $P_T = P_C \left(1 + \frac{m^2}{2}\right)$
- 6) In superhetrodyne receiver the frequency of local oscillator is \_\_\_\_\_.  
a) higher than the incoming signal frequency  
b) lower than the incoming signal frequency  
c) equal to the incoming signal frequency  
d) none of above



- 7) In a radio receiver with simple AGC \_\_\_\_\_.  
a) the highest AGC voltage is produced between stations  
b) An increase signal strength produces more AGC  
c) audio stage gain is normally controlled by the AGC  
d) the faster the ACG time constant, the more accurate the output
- 8) In PM, the frequency deviation is proportional to \_\_\_\_\_.  
a) only modulating frequency  
b) both amplitude and frequency  
c) only amplitude of modulating signal  
d) antenna height
- 9) Which of the following statement is not valid for Armstrong modulation modulation system?  
a) the system is basically PM not FM  
b) AFC is not needed as a crystal oscillator is used  
c) frequency multiplication must be used  
d) equalization is unnecessary
- 10) Broadcasting antenna are generally \_\_\_\_\_.  
a) omni directional antenna                      b) vertical type  
c) horizontal type                                      d) any of these
- 11) During day time, the ionosphere consists of \_\_\_\_\_.  
a) D, E, F layers                                      b) D, E, F<sub>1</sub> layers  
c) D, E, F<sub>2</sub> layers                                      d) D, E, F<sub>1</sub>, F<sub>2</sub> layers
- 12) The ionosphere plays a significant role in radio wave propagation at \_\_\_\_\_.  
a) high frequency                                      b) ultra high frequency  
c) microwaves frequencies                      d) optical frequencies
- 13) In Pulse time modulation (PTM), \_\_\_\_\_.  
a) Amplitude of the carrier is constant  
b) Position or width of the carrier varies with modulating signal  
c) Pulse width modulation and pulse position modulation are the types of PTM  
d) All of the above
- 14) The sampling technique having the minimum noise interference is \_\_\_\_\_.  
a) Instantaneous sampling                      b) Natural sampling  
c) Flat top sampling                                      d) All of the above

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Four) 16**

- Why modulation is required?
- What are the different types of communication channels?
- Classify noise and give the example of each.
- Draw and explain superhetrodyne receiver.
- Define Bandwidth. The resonant frequency of RF amplifier of a receiver is a 1 MHz and its bandwidth is 10 KHz. What is the Q Factor?

**Q.3 Answer the following questions. (Any Two) 12**

- The output voltage of a transmitter is given by  $400(1+0.4 \sin 6280 t) \sin 3.14 \times 10^7 t$ . this voltage is fed to a load of  $600 \Omega$  resistance Determine:
  - carrier frequency
  - Modulating frequency
  - Carrier power
  - Total power output
  - Peak power output
- Comparison between DSB, SSB, ISB, and VSB with different parameters.
- Derive an expression for noise equivalent resistance due to cascading of many amplifiers.

**Section – II**

**Q.4 Answer the following questions. (Any Four) 16**

- The carrier swing of a frequency modulated signal is 70KHz and the modulating signal is a 7 KHz sine wave determine the modulation index of the FM signal.
- Explain pre-emphasis and de emphasis in brief.
- Define Nyquist Rate and its significant.
- Define characteristics of antenna.
- Explain Sky wave propagation.

**Q.5 Answer the following questions. (Any Two) 12**

- With suitable circuit diagram explain a frequency modulation of a crystal oscillator with a varactor diode.
- State and prove Sampling Theorem. Discuss the different types of Sampling.
- Illustrate with a neat diagram PAM Generation and Regeneration technique.

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Set **Q****S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022****ELECTRONICS ENGINEERING****Analog Communication**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) In PM, the frequency deviation is proportional to \_\_\_\_\_.  
 a) only modulating frequency  
 b) both amplitude and frequency  
 c) only amplitude of modulating signal  
 d) antenna height
- 2) Which of the following statement is not valid for Armstrong modulation modulation system?  
 a) the system is basically PM not FM  
 b) AFC is not needed as a crystal oscillator is used  
 c) frequency multiplication must be used  
 d) equalization is unnecessary
- 3) Broadcasting antenna are generally \_\_\_\_\_.  
 a) omni directional antenna      b) vertical type  
 c) horizontal type      d) any of these
- 4) During day time, the ionosphere consists of \_\_\_\_\_.  
 a) D, E, F layers      b) D, E, F<sub>1</sub> layers  
 c) D, E, F<sub>2</sub> layers      d) D, E, F<sub>1</sub>, F<sub>2</sub> layers
- 5) The ionosphere plays a significant role in radio wave propagation at \_\_\_\_\_.  
 a) high frequency      b) ultra high frequency  
 c) microwaves frequencies      d) optical frequencies
- 6) In Pulse time modulation (PTM), \_\_\_\_\_.  
 a) Amplitude of the carrier is constant  
 b) Position or width of the carrier varies with modulating signal  
 c) Pulse width modulation and pulse position modulation are the types of PTM  
 d) All of the above
- 7) The sampling technique having the minimum noise interference is \_\_\_\_\_.  
 a) Instantaneous sampling      b) Natural sampling  
 c) Flat top sampling      d) All of the above

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Four) 16**

- Why modulation is required?
- What are the different types of communication channels?
- Classify noise and give the example of each.
- Draw and explain superhetrodyne receiver.
- Define Bandwidth. The resonant frequency of RF amplifier of a receiver is a 1 MHz and its bandwidth is 10 KHz. What is the Q Factor?

**Q.3 Answer the following questions. (Any Two) 12**

- The output voltage of a transmitter is given by  $400(1+0.4 \sin 6280 t) \sin 3.14 \times 10^7 t$ . this voltage is fed to a load of  $600 \Omega$  resistance  
 Determine:
  - carrier frequency
  - Modulating frequency
  - Carrier power
  - Total power output
  - Peak power output
- Comparison between DSB, SSB, ISB, and VSB with different parameters.
- Derive an expression for noise equivalent resistance due to cascading of many amplifiers.

**Section – II**

**Q.4 Answer the following questions. (Any Four) 16**

- The carrier swing of a frequency modulated signal is 70KHz and the modulating signal is a 7 KHz sine wave determine the modulation index of the FM signal.
- Explain pre-emphasis and de emphasis in brief.
- Define Nyquist Rate and its significant.
- Define characteristics of antenna.
- Explain Sky wave propagation.

**Q.5 Answer the following questions. (Any Two) 12**

- With suitable circuit diagram explain a frequency modulation of a crystal oscillator with a varactor diode.
- State and prove Sampling Theorem. Discuss the different types of Sampling.
- Illustrate with a neat diagram PAM Generation and Regeneration technique.

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- 8) Noise power at the resistor is affected by the value of the resistor as \_\_\_\_\_.  
 a) Directly proportional to the value of the resistor  
 b) Inversely proportional to the value of the resistor  
 c) Unaffected by the value of the resistor  
 d) Becomes half as the resistance value is doubled
- 9) The relation between carrier power and total power in an AM wave is \_\_\_\_\_.  
 a)  $P_C = P_T \left( 1 + \frac{m^2}{4} \right)$                       b)  $P_C = P_T \left( 1 + \frac{m^2}{2} \right)$   
 c)  $P_T = P_C \left( 1 + \frac{m^2}{4} \right)$                       d)  $P_T = P_C \left( 1 + \frac{m^2}{2} \right)$
- 10) In superhetrodyne receiver the frequency of local oscillator is \_\_\_\_\_.  
 a) higher than the incoming signal frequency  
 b) lower than the incoming signal frequency  
 c) equal to the incoming signal frequency  
 d) none of above
- 11) In a radio receiver with simple AGC \_\_\_\_\_.  
 a) the highest AGC voltage is produced between stations  
 b) An increase signal strength produces more AGC  
 c) audio stage gain is normally controlled by the AGC  
 d) the faster the ACG time constant, the more accurate the output
- 12) In PM, the frequency deviation is proportional to \_\_\_\_\_.  
 a) only modulating frequency  
 b) both amplitude and frequency  
 c) only amplitude of modulating signal  
 d) antenna height
- 13) Which of the following statement is not valid for Armstrong modulation modulation system?  
 a) the system is basically PM not FM  
 b) AFC is not needed as a crystal oscillator is used  
 c) frequency multiplication must be used  
 d) equalization is unnecessary
- 14) Broadcasting antenna are generally \_\_\_\_\_.  
 a) omni directional antenna                      b) vertical type  
 c) horizontal type                                      d) any of these

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Four) 16**

- Why modulation is required?
- What are the different types of communication channels?
- Classify noise and give the example of each.
- Draw and explain superhetrodyne receiver.
- Define Bandwidth. The resonant frequency of RF amplifier of a receiver is a 1 MHz and its bandwidth is 10 KHz. What is the Q Factor?

**Q.3 Answer the following questions. (Any Two) 12**

- The output voltage of a transmitter is given by  $400(1+0.4 \sin 6280 t) \sin 3.14 \times 10^7 t$ . this voltage is fed to a load of  $600 \Omega$  resistance  
 Determine:
  - carrier frequency
  - Modulating frequency
  - Carrier power
  - Total power output
  - Peak power output
- Comparison between DSB, SSB, ISB, and VSB with different parameters.
- Derive an expression for noise equivalent resistance due to cascading of many amplifiers.

**Section – II**

**Q.4 Answer the following questions. (Any Four) 16**

- The carrier swing of a frequency modulated signal is 70KHz and the modulating signal is a 7 KHz sine wave determine the modulation index of the FM signal.
- Explain pre-emphasis and de emphasis in brief.
- Define Nyquist Rate and its significant.
- Define characteristics of antenna.
- Explain Sky wave propagation.

**Q.5 Answer the following questions. (Any Two) 12**

- With suitable circuit diagram explain a frequency modulation of a crystal oscillator with a varactor diode.
- State and prove Sampling Theorem. Discuss the different types of Sampling.
- Illustrate with a neat diagram PAM Generation and Regeneration technique.



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In superhetrodyne receiver the frequency of local oscillator is \_\_\_\_\_.  
 a) higher than the incoming signal frequency  
 b) lower than the incoming signal frequency  
 c) equal to the incoming signal frequency  
 d) none of above
- 2) In a radio receiver with simple AGC \_\_\_\_\_.  
 a) the highest AGC voltage is produced between stations  
 b) An increase signal strength produces more AGC  
 c) audio stage gain is normally controlled by the AGC  
 d) the faster the ACG time constant, the more accurate the output
- 3) In PM, the frequency deviation is proportional to \_\_\_\_\_.  
 a) only modulating frequency  
 b) both amplitude and frequency  
 c) only amplitude of modulating signal  
 d) antenna height
- 4) Which of the following statement is not valid for Armstrong modulation modulation system?  
 a) the system is basically PM not FM  
 b) AFC is not needed as a crystal oscillator is used  
 c) frequency multiplication must be used  
 d) equalization is unnecessary
- 5) Broadcasting antenna are generally \_\_\_\_\_.  
 a) omni directional antenna                      b) vertical type  
 c) horizontal type                                      d) any of these
- 6) During day time, the ionosphere consists of \_\_\_\_\_.  
 a) D, E, F layers                                      b) D, E, F<sub>1</sub> layers  
 c) D, E, F<sub>2</sub> layers                                      d) D, E, F<sub>1</sub>, F<sub>2</sub> layers
- 7) The ionosphere plays a significant role in radio wave propagation at \_\_\_\_\_.  
 a) high frequency                                      b) ultra high frequency  
 c) microwaves frequencies                              d) optical frequencies

- 8) In Pulse time modulation (PTM), \_\_\_\_\_.  
 a) Amplitude of the carrier is constant  
 b) Position or width of the carrier varies with modulating signal  
 c) Pulse width modulation and pulse position modulation are the types of PTM  
 d) All of the above
- 9) The sampling technique having the minimum noise interference is \_\_\_\_\_.  
 a) Instantaneous sampling                      b) Natural sampling  
 c) Flat top sampling                              d) All of the above
- 10) In a low level amplitude modulation system, the amplifier following the modulated stage must be \_\_\_\_\_.  
 a) Linear device                                      b) Non Linear device  
 c) harmonics device                              d) Class C amplifier
- 11) Thermal noise voltage in a resistor R is given by \_\_\_\_\_.  
 a)  $\sqrt{4RkTB}$                                       b)  $kTB$   
 c)  $TBk^2$                                               d) None
- 12) In an amplitude modulated waveform the amplitude of side bands is \_\_\_\_\_.  
 a) Independent of the carrier amplitude  
 b) Independent of the modulation index  
 c) carrier amplitude x modulation index  
 d) 1/2 carrier amplitude x modulation index
- 13) Noise power at the resistor is affected by the value of the resistor as \_\_\_\_\_.  
 a) Directly proportional to the value of the resistor  
 b) Inversely proportional to the value of the resistor  
 c) Unaffected by the value of the resistor  
 d) Becomes half as the resistance value is doubled
- 14) The relation between carrier power and total power in an AM wave is \_\_\_\_\_.  
 a)  $P_C = P_T \left(1 + \frac{m^2}{4}\right)$                       b)  $P_C = P_T \left(1 + \frac{m^2}{2}\right)$   
 c)  $P_T = P_C \left(1 + \frac{m^2}{4}\right)$                       d)  $P_T = P_C \left(1 + \frac{m^2}{2}\right)$

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Four) 16**

- Why modulation is required?
- What are the different types of communication channels?
- Classify noise and give the example of each.
- Draw and explain superhetrodyne receiver.
- Define Bandwidth. The resonant frequency of RF amplifier of a receiver is a 1 MHz and its bandwidth is 10 KHz. What is the Q Factor?

**Q.3 Answer the following questions. (Any Two) 12**

- The output voltage of a transmitter is given by  $400(1+0.4 \sin 6280 t) \sin 3.14 \times 10^7 t$ . this voltage is fed to a load of  $600 \Omega$  resistance  
 Determine:
  - carrier frequency
  - Modulating frequency
  - Carrier power
  - Total power output
  - Peak power output
- Comparison between DSB, SSB, ISB, and VSB with different parameters.
- Derive an expression for noise equivalent resistance due to cascading of many amplifiers.

**Section – II**

**Q.4 Answer the following questions. (Any Four) 16**

- The carrier swing of a frequency modulated signal is 70KHz and the modulating signal is a 7 KHz sine wave determine the modulation index of the FM signal.
- Explain pre-emphasis and de emphasis in brief.
- Define Nyquist Rate and its significant.
- Define characteristics of antenna.
- Explain Sky wave propagation.

**Q.5 Answer the following questions. (Any Two) 12**

- With suitable circuit diagram explain a frequency modulation of a crystal oscillator with a varactor diode.
- State and prove Sampling Theorem. Discuss the different types of Sampling.
- Illustrate with a neat diagram PAM Generation and Regeneration technique.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?
 

|                          |                             |
|--------------------------|-----------------------------|
| a) Gaussian Distribution | b) Poisson Distribution     |
| c) Rayleigh Distribution | d) Exponential Distribution |
- 2) A variable that can assume any value between two given points is called \_\_\_\_\_.
 

|                               |                              |
|-------------------------------|------------------------------|
| a) Continuous random variable | b) Discrete random variable  |
| c) Irregular random variable  | d) Uncertain random variable |
- 3) \_\_\_\_\_ is an incredibly powerful tool for analysing data.
 

|                      |                        |
|----------------------|------------------------|
| a) Linear regression | b) Logistic regression |
| c) Gradient Descent  | d) Greedy algorithms   |
- 4) Analysis of variance in short form is?
 

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| a) ANOV  | b) AVA  |
| c) ANOVA | d) ANVA |
- 5) The matrix which follows the conditions  $m=n$  is called?
 

|                  |                       |
|------------------|-----------------------|
| a) Square matrix | b) Rectangular matrix |
| c) Scalar matrix | d) Diagonal matrix    |
- 6) If the order of the matrix is  $m \times n$ , then how many elements will there be in the matrix?
 

|           |             |
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| a) $mn$   | b) $m^2n^2$ |
| c) $mn^2$ | d) $2mn$    |
- 7) What is the probability of an impossible event?
 

|                      |                |
|----------------------|----------------|
| a) 1                 | b) 0           |
| c) Insufficient data | d) Not defined |
- 8) PCA reduce dimensionality of the data using feature extraction.
 

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| a) True | b) False |
|---------|----------|
- 9) Analysis of ML algorithm needs \_\_\_\_\_.
 

|                                |                                  |
|--------------------------------|----------------------------------|
| a) Statistical learning theory | b) Computational learning theory |
| c) Both A and B                | d) None of the above             |

- 10) Among the following identify the one in which dimensionality reduction reduces \_\_\_\_\_.
  - a) Performance
  - b) Entropy
  - c) Stochastic
  - d) Co linearity
- 11) Choose a disadvantage of decision trees among the following.
  - a) Decision trees are robust to outliers
  - b) Factor analysis
  - c) Decision trees are prone to overfit
  - d) All of above
- 12) Which of the following are common classes of problems in machine learning?
  - a) Regression
  - b) Classification
  - c) Clustering
  - d) All of above
- 13) Under which condition SVD and PCA produce the same projection result?
  - a) When data has zero median
  - b) When data has zero mean
  - c) Both are always same
  - d) None of these
- 14) Decision tree cannot be used for clustering.
  - a) True
  - b) False

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Differentiate between discrete probability and continuous probability.
  - Describe linear regression in detail.
  - Solve following using Substitute method.  
 $2x-3y=-2$        $4x+y=24$
  - Explain problem formulation in regression.
  - Explain Bayes theorem in detail.
- Q.3 Answer the following questions. (Any Two) 12**
- Explain various rules in probability with proper example.
  - Describe eigen values and eigenvectors in detail.
  - Define dependent event. Explain dependent event with example.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- Explain steps in PCA.
  - Explain dimensionality reduction with benefits and disadvantages.
  - Differentiate between under fitting and over fitting.
  - What is generalization? Explain generalization in detail.
  - Define machine learning. Describe various learning models in detail.
- Q.5 Answer the following questions. (Any Two) 12**
- Explain the applications of machine learning.
  - Explain under fitting and over fitting in detail.
  - Explain decision theory in machine learning.

Set Q

Max. Marks: 70

- 9) A variable that can assume any value between two given points is called \_\_\_\_\_.
- a) Continuous random variable      b) Discrete random variable  
c) Irregular random variable      d) Uncertain random variable
- 10) \_\_\_\_\_ is an incredibly powerful tool for analysing data.
- a) Linear regression      b) Logistic regression  
c) Gradient Descent      d) Greedy algorithms
- 11) Analysis of variance in short form is?
- a) ANOV      b) AVA  
c) ANOVA      d) ANVA
- 12) The matrix which follows the conditions  $m=n$  is called?
- a) Square matrix      b) Rectangular matrix  
c) Scalar matrix      d) Diagonal matrix
- 13) If the order of the matrix is  $m \times n$ , then how many elements will there be in the matrix?
- a)  $mn$       b)  $m^2n^2$   
c)  $mn^2$       d)  $2mn$
- 14) What is the probability of an impossible event?
- a) 1      b) 0  
c) Insufficient data      d) Not defined



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Differentiate between discrete probability and continuous probability.
  - Describe linear regression in detail.
  - Solve following using Substitute method.  
 $2x-3y=-2$        $4x+y=24$
  - Explain problem formulation in regression.
  - Explain Bayes theorem in detail.
- Q.3 Answer the following questions. (Any Two) 12**
- Explain various rules in probability with proper example.
  - Describe eigen values and eigenvectors in detail.
  - Define dependent event. Explain dependent event with example.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- Explain steps in PCA.
  - Explain dimensionality reduction with benefits and disadvantages.
  - Differentiate between under fitting and over fitting.
  - What is generalization? Explain generalization in detail.
  - Define machine learning. Describe various learning models in detail.
- Q.5 Answer the following questions. (Any Two) 12**
- Explain the applications of machine learning.
  - Explain under fitting and over fitting in detail.
  - Explain decision theory in machine learning.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Choose a disadvantage of decision trees among the following.
  - a) Decision trees are robust to outliers
  - b) Factor analysis
  - c) Decision trees are prone to overfit
  - d) All of above
- 2) Which of the following are common classes of problems in machine learning?
  - a) Regression
  - b) Classification
  - c) Clustering
  - d) All of above
- 3) Under which condition SVD and PCA produce the same projection result?
  - a) When data has zero median
  - b) When data has zero mean
  - c) Both are always same
  - d) None of these
- 4) Decision tree cannot be used for clustering.
  - a) True
  - b) False
- 5) Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?
  - a) Gaussian Distribution
  - b) Poisson Distribution
  - c) Rayleigh Distribution
  - d) Exponential Distribution
- 6) A variable that can assume any value between two given points is called \_\_\_\_\_.
  - a) Continuous random variable
  - b) Discrete random variable
  - c) Irregular random variable
  - d) Uncertain random variable
- 7) \_\_\_\_\_ is an incredibly powerful tool for analysing data.
  - a) Linear regression
  - b) Logistic regression
  - c) Gradient Descent
  - d) Greedy algorithms
- 8) Analysis of variance in short form is?
  - a) ANOV
  - b) AVA
  - c) ANOVA
  - d) ANVA
- 9) The matrix which follows the conditions  $m=n$  is called?
  - a) Square matrix
  - b) Rectangular matrix
  - c) Scalar matrix
  - d) Diagonal matrix

- 10)** If the order of the matrix is  $m \times n$ , then how many elements will there be in the matrix?
- |           |             |
|-----------|-------------|
| a) $mn$   | b) $m^2n^2$ |
| c) $mn^2$ | d) $2mn$    |
- 11)** What is the probability of an impossible event?
- |                      |                |
|----------------------|----------------|
| a) 1                 | b) 0           |
| c) Insufficient data | d) Not defined |
- 12)** PCA reduce dimensionality of the data using feature extraction.
- |         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|
- 13)** Analysis of ML algorithm needs \_\_\_\_.
- |                                |                                  |
|--------------------------------|----------------------------------|
| a) Statistical learning theory | b) Computational learning theory |
| c) Both A and B                | d) None of the above             |
- 14)** Among the following identify the one in which dimensionality reduction reduces \_\_\_\_.
- |                |                 |
|----------------|-----------------|
| a) Performance | b) Entropy      |
| c) Stochastic  | d) Co linearity |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Differentiate between discrete probability and continuous probability.
  - Describe linear regression in detail.
  - Solve following using Substitute method.  
 $2x-3y=-2$        $4x+y=24$
  - Explain problem formulation in regression.
  - Explain Bayes theorem in detail.
- Q.3 Answer the following questions. (Any Two) 12**
- Explain various rules in probability with proper example.
  - Describe eigen values and eigenvectors in detail.
  - Define dependent event. Explain dependent event with example.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- Explain steps in PCA.
  - Explain dimensionality reduction with benefits and disadvantages.
  - Differentiate between under fitting and over fitting.
  - What is generalization? Explain generalization in detail.
  - Define machine learning. Describe various learning models in detail.
- Q.5 Answer the following questions. (Any Two) 12**
- Explain the applications of machine learning.
  - Explain under fitting and over fitting in detail.
  - Explain decision theory in machine learning.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If the order of the matrix is  $m \times n$ , then how many elements will there be in the matrix?
 

|           |             |
|-----------|-------------|
| a) $mn$   | b) $m^2n^2$ |
| c) $mn^2$ | d) $2mn$    |
- 2) What is the probability of an impossible event?
 

|                      |                |
|----------------------|----------------|
| a) 1                 | b) 0           |
| c) Insufficient data | d) Not defined |
- 3) PCA reduce dimensionality of the data using feature extraction.
 

|         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|
- 4) Analysis of ML algorithm needs \_\_\_\_\_.
 

|                                |                                  |
|--------------------------------|----------------------------------|
| a) Statistical learning theory | b) Computational learning theory |
| c) Both A and B                | d) None of the above             |
- 5) Among the following identify the one in which dimensionality reduction reduces \_\_\_\_\_.
 

|                |                 |
|----------------|-----------------|
| a) Performance | b) Entropy      |
| c) Stochastic  | d) Co linearity |
- 6) Choose a disadvantage of decision trees among the following.
 

|                                          |
|------------------------------------------|
| a) Decision trees are robust to outliers |
| b) Factor analysis                       |
| c) Decision trees are prone to overfit   |
| d) All of above                          |
- 7) Which of the following are common classes of problems in machine learning?
 

|               |                   |
|---------------|-------------------|
| a) Regression | b) Classification |
| c) Clustering | d) All of above   |
- 8) Under which condition SVD and PCA produce the same projection result?
 

|                              |                            |
|------------------------------|----------------------------|
| a) When data has zero median | b) When data has zero mean |
| c) Both are always same      | d) None of these           |

- 9) Decision tree cannot be used for clustering.  
a) True                                      b) False
- 10) Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?  
a) Gaussian Distribution                  b) Poisson Distribution  
c) Rayleigh Distribution                 d) Exponential Distribution
- 11) A variable that can assume any value between two given points is called \_\_\_\_\_.  
a) Continuous random variable          b) Discrete random variable  
c) Irregular random variable            d) Uncertain random variable
- 12) \_\_\_\_\_ is an incredibly powerful tool for analysing data.  
a) Linear regression                        b) Logistic regression  
c) Gradient Descent                        d) Greedy algorithms
- 13) Analysis of variance in short form is?  
a) ANOV                                        b) AVA  
c) ANOVA                                       d) ANVA
- 14) The matrix which follows the conditions  $m=n$  is called?  
a) Square matrix                              b) Rectangular matrix  
c) Scalar matrix                               d) Diagonal matrix

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if required.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- a) Differentiate between discrete probability and continuous probability.
  - b) Describe linear regression in detail.
  - c) Solve following using Substitute method.  
 $2x-3y=-2$        $4x+y=24$
  - d) Explain problem formulation in regression.
  - e) Explain Bayes theorem in detail.
- Q.3 Answer the following questions. (Any Two) 12**
- a) Explain various rules in probability with proper example.
  - b) Describe eigen values and eigenvectors in detail.
  - c) Define dependent event. Explain dependent event with example.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- a) Explain steps in PCA.
  - b) Explain dimensionality reduction with benefits and disadvantages.
  - c) Differentiate between under fitting and over fitting.
  - d) What is generalization? Explain generalization in detail.
  - e) Define machine learning. Describe various learning models in detail.
- Q.5 Answer the following questions. (Any Two) 12**
- a) Explain the applications of machine learning.
  - b) Explain under fitting and over fitting in detail.
  - c) Explain decision theory in machine learning.

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which type of data can be stored in the database?
  - a) Image oriented data
  - b) Text, files containing data
  - c) Data in the form of audio or video
  - d) All of the above
- 2) What does an RDBMS consist of?
 

|                          |                         |
|--------------------------|-------------------------|
| a) Collection of Records | b) Collection of Keys   |
| c) Collection of Tables  | d) Collection of Fields |
- 3) The DBMS acts as an interface between \_\_\_\_\_ and \_\_\_\_\_ of an enterprise-class system.
  - a) Data and the DBMS
  - b) Application and SQL
  - c) Database application and the database
  - d) The user and the software
- 4) What is the function of the following command? Delete from r where P;
  - a) Clears entries from relation
  - b) Deletes relation
  - c) Deletes particular tuple from relation
  - d) All of the mentioned
- 5) Which of the following is the full form of DDL?
 

|                             |                             |
|-----------------------------|-----------------------------|
| a) Data definition language | b) Data derivation language |
| c) Dynamic data language    | d) Detailed data language   |
- 6) Which of the following is known as minimal super key?
 

|                |                  |
|----------------|------------------|
| a) Primary key | b) Candidate key |
| c) Foreign key | d) None          |
- 7) Which clause is used to retrieve a unique element from the table?
 

|                   |                      |
|-------------------|----------------------|
| a) SELECT UNIQUE  | b) SELECT DISTINCT   |
| c) Both A) and B) | d) None of the above |



- 8) What is ACID properties of Transactions?
- a) Atomicity, Consistency, Isolation, Database
  - b) Atomicity, Consistency, Isolation, Durability
  - c) Atomicity, Consistency, Inconsistent, Durability
  - d) Automatically, Concurrency. Isolation, Durability
- 9) A table is in 3NF if it is in 2NF and if it has no \_\_\_\_\_.  
a) Functional Dependencies                      b) Transitive Dependencies  
c) Trivial Functional Dependency              d) Multivalued Dependencies
- 10) Redundancy is reduced in a database table by using the \_\_\_\_\_ form.  
a) Abnormal                                          b) Normal  
c) Special                                            d) None
- 11) Which of the following is a type of Normal Form?  
a) ACNF                                              b) BCNF  
c) CCNF                                              d) DCNF
- 12) Some database columns can be used to create \_\_\_\_\_.  
a) Indices                                            b) Files  
c) Indexes                                            d) Records
- 13) Which of the following systems is responsible for ensuring isolation?  
a) Recovery system                                b) Atomic system  
c) Concurrency control system                d) Compiler system
- 14) In order to undo the work of transaction after last commit which one should be used?  
a) View                                              b) Commit  
c) Rollback                                           d) Flashback

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Set **P**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three** **12**
- List four significant features of file processing system.
  - Explain any four relational algebra operations with example.
  - Define the following terms Entity, Attributes, Entity Sets, Cardinality and its types.
  - Discuss various DDL commands in SQL.
- Q.3 Attempt any two.** **16**
- Draw ER diagram for below scenario: A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
  - In SQL, explain the terms with syntax and example. SELECT, DISTINCT, WHERE, ORDERBY
  - List significant differences between a file-processing system and DBMS.

**Section - II**

- Q.4 Attempt any three** **12**
- Define functional dependency and need of normalization.
  - Explain the terms: Transaction, ACID Property
  - Explain the following terms with example; primary indexing and clustering indexing.
  - Discuss timestamp-based protocol.
- Q.5 Attempt any two** **16**
- Discuss types of normalization in detail with example.
  - Explain conflict serializability with example.
  - Consider following schedules involving two transactions:  
 S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)  
 S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
    - If given schedule is conflict serializable convert it into Conflict Serializable schedule.
    - If given schedule is not conflict serializable convert it into View Serializable Schedule.

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is ACID properties of Transactions?
  - a) Atomicity, Consistency, Isolation, Database
  - b) Atomicity, Consistency, Isolation, Durability
  - c) Atomicity, Consistency, Inconsistent, Durability
  - d) Automatically, Concurrency. Isolation, Durability
- 2) A table is in 3NF if it is in 2NF and if it has no \_\_\_\_\_.
  - a) Functional Dependencies
  - b) Transitive Dependencies
  - c) Trivial Functional Dependency
  - d) Multivalued Dependencies
- 3) Redundancy is reduced in a database table by using the \_\_\_\_\_ form.
  - a) Abnormal
  - b) Normal
  - c) Special
  - d) None
- 4) Which of the following is a type of Normal Form?
  - a) ACNF
  - b) BCNF
  - c) CCNF
  - d) DCNF
- 5) Some database columns can be used to create \_\_\_\_\_.
  - a) Indices
  - b) Files
  - c) Indexes
  - d) Records
- 6) Which of the following systems is responsible for ensuring isolation?
  - a) Recovery system
  - b) Atomic system
  - c) Concurrency control system
  - d) Compiler system
- 7) In order to undo the work of transaction after last commit which one should be used?
  - a) View
  - b) Commit
  - c) Rollback
  - d) Flashback
- 8) Which type of data can be stored in the database?
  - a) Image oriented data
  - b) Text, files containing data
  - c) Data in the form of audio or video
  - d) All of the above

- 9) What does an RDBMS consist of?
- a) Collection of Records
  - b) Collection of Keys
  - c) Collection of Tables
  - d) Collection of Fields
- 10) The DBMS acts as an interface between \_\_\_\_\_ and \_\_\_\_\_ of an enterprise-class system.
- a) Data and the DBMS
  - b) Application and SQL
  - c) Database application and the database
  - d) The user and the software
- 11) What is the function of the following command? Delete from r where P;
- a) Clears entries from relation
  - b) Deletes relation
  - c) Deletes particular tuple from relation
  - d) All of the mentioned
- 12) Which of the following is the full form of DDL?
- a) Data definition language
  - b) Data derivation language
  - c) Dynamic data language
  - d) Detailed data language
- 13) Which of the following is known as minimal super key?
- a) Primary key
  - b) Candidate key
  - c) Foreign key
  - d) None
- 14) Which clause is used to retrieve a unique element from the table?
- a) SELECT UNIQUE
  - b) SELECT DISTINCT
  - c) Both A) and B)
  - d) None of the above

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three** **12**
- List four significant features of file processing system.
  - Explain any four relational algebra operations with example.
  - Define the following terms Entity, Attributes, Entity Sets, Cardinality and its types.
  - Discuss various DDL commands in SQL.
- Q.3 Attempt any two.** **16**
- Draw ER diagram for below scenario: A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
  - In SQL, explain the terms with syntax and example. SELECT, DISTINCT, WHERE, ORDERBY
  - List significant differences between a file-processing system and DBMS.

**Section - II**

- Q.4 Attempt any three** **12**
- Define functional dependency and need of normalization.
  - Explain the terms: Transaction, ACID Property
  - Explain the following terms with example; primary indexing and clustering indexing.
  - Discuss timestamp-based protocol.
- Q.5 Attempt any two** **16**
- Discuss types of normalization in detail with example.
  - Explain conflict serializability with example.
  - Consider following schedules involving two transactions:  
 S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)  
 S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
    - If given schedule is conflict serializable convert it into Conflict Serializable schedule.
    - If given schedule is not conflict serializable convert it into View Serializable Schedule.

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is a type of Normal Form?
 

|         |         |
|---------|---------|
| a) ACNF | b) BCNF |
| c) CCNF | d) DCNF |
- 2) Some database columns can be used to create \_\_\_\_\_.
 

|            |            |
|------------|------------|
| a) Indices | b) Files   |
| c) Indexes | d) Records |
- 3) Which of the following systems is responsible for ensuring isolation?
 

|                               |                    |
|-------------------------------|--------------------|
| a) Recovery system            | b) Atomic system   |
| c) Concurrency control system | d) Compiler system |
- 4) In order to undo the work of transaction after last commit which one should be used?
 

|             |              |
|-------------|--------------|
| a) View     | b) Commit    |
| c) Rollback | d) Flashback |
- 5) Which type of data can be stored in the database?
 

|                                       |
|---------------------------------------|
| a) Image oriented data                |
| b) Text, files containing data        |
| c) Data in the form of audio or video |
| d) All of the above                   |
- 6) What does an RDBMS consist of?
 

|                          |                         |
|--------------------------|-------------------------|
| a) Collection of Records | b) Collection of Keys   |
| c) Collection of Tables  | d) Collection of Fields |
- 7) The DBMS acts as an interface between \_\_\_\_\_ and \_\_\_\_\_ of an enterprise-class system.
 

|                                          |
|------------------------------------------|
| a) Data and the DBMS                     |
| b) Application and SQL                   |
| c) Database application and the database |
| d) The user and the software             |

- 8) What is the function of the following command? Delete from r where P;  
a) Clears entries from relation  
b) Deletes relation  
c) Deletes particular tuple from relation  
d) All of the mentioned
- 9) Which of the following is the full form of DDL?  
a) Data definition language                      b) Data derivation language  
c) Dynamic data language                      d) Detailed data language
- 10) Which of the following is known as minimal super key?  
a) Primary key                                      b) Candidate key  
c) Foreign key                                      d) None
- 11) Which clause is used to retrieve a unique element from the table?  
a) SELECT UNIQUE                                  b) SELECT DISTINCT  
c) Both A) and B)                                  d) None of the above
- 12) What is ACID properties of Transactions?  
a) Atomicity, Consistency, Isolation, Database  
b) Atomicity, Consistency, Isolation, Durability  
c) Atomicity, Consistency, Inconsistent, Durability  
d) Automatically, Concurrency. Isolation, Durability
- 13) A table is in 3NF if it is in 2NF and if it has no \_\_\_\_\_.  
a) Functional Dependencies                      b) Transitive Dependencies  
c) Trivial Functional Dependency              d) Multivalued Dependencies
- 14) Redundancy is reduced in a database table by using the \_\_\_\_\_ form.  
a) Abnormal                                          b) Normal  
c) Special                                              d) None

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Set **R**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three** **12**
- List four significant features of file processing system.
  - Explain any four relational algebra operations with example.
  - Define the following terms Entity, Attributes, Entity Sets, Cardinality and its types.
  - Discuss various DDL commands in SQL.
- Q.3 Attempt any two.** **16**
- Draw ER diagram for below scenario: A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
  - In SQL, explain the terms with syntax and example. SELECT, DISTINCT, WHERE, ORDERBY
  - List significant differences between a file-processing system and DBMS.

**Section - II**

- Q.4 Attempt any three** **12**
- Define functional dependency and need of normalization.
  - Explain the terms: Transaction, ACID Property
  - Explain the following terms with example; primary indexing and clustering indexing.
  - Discuss timestamp-based protocol.
- Q.5 Attempt any two** **16**
- Discuss types of normalization in detail with example.
  - Explain conflict serializability with example.
  - Consider following schedules involving two transactions:  
 S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)  
 S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
    - If given schedule is conflict serializable convert it into Conflict Serializable schedule.
    - If given schedule is not conflict serializable convert it into View Serializable Schedule.



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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is known as minimal super key?
  - a) Primary key
  - b) Candidate key
  - c) Foreign key
  - d) None
- 2) Which clause is used to retrieve a unique element from the table?
  - a) SELECT UNIQUE
  - b) SELECT DISTINCT
  - c) Both A) and B)
  - d) None of the above
- 3) What is ACID properties of Transactions?
  - a) Atomicity, Consistency, Isolation, Database
  - b) Atomicity, Consistency, Isolation, Durability
  - c) Atomicity, Consistency, Inconsistent, Durability
  - d) Automatically, Concurrency. Isolation, Durability
- 4) A table is in 3NF if it is in 2NF and if it has no \_\_\_\_\_.
  - a) Functional Dependencies
  - b) Transitive Dependencies
  - c) Trivial Functional Dependency
  - d) Multivalued Dependencies
- 5) Redundancy is reduced in a database table by using the \_\_\_\_\_ form.
  - a) Abnormal
  - b) Normal
  - c) Special
  - d) None
- 6) Which of the following is a type of Normal Form?
  - a) ACNF
  - b) BCNF
  - c) CCNF
  - d) DCNF
- 7) Some database columns can be used to create \_\_\_\_\_.
  - a) Indices
  - b) Files
  - c) Indexes
  - d) Records
- 8) Which of the following systems is responsible for ensuring isolation?
  - a) Recovery system
  - b) Atomic system
  - c) Concurrency control system
  - d) Compiler system
- 9) In order to undo the work of transaction after last commit which one should be used?
  - a) View
  - b) Commit
  - c) Rollback
  - d) Flashback

- 10)** Which type of data can be stored in the database?
- a) Image oriented data
  - b) Text, files containing data
  - c) Data in the form of audio or video
  - d) All of the above
- 11)** What does an RDBMS consist of?
- a) Collection of Records
  - b) Collection of Keys
  - c) Collection of Tables
  - d) Collection of Fields
- 12)** The DBMS acts as an interface between \_\_\_\_\_ and \_\_\_\_\_ of an enterprise-class system.
- a) Data and the DBMS
  - b) Application and SQL
  - c) Database application and the database
  - d) The user and the software
- 13)** What is the function of the following command? Delete from r where P;
- a) Clears entries from relation
  - b) Deletes relation
  - c) Deletes particular tuple from relation
  - d) All of the mentioned
- 14)** Which of the following is the full form of DDL?
- a) Data definition language
  - b) Data derivation language
  - c) Dynamic data language
  - d) Detailed data language

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Set **S**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three** **12**
- List four significant features of file processing system.
  - Explain any four relational algebra operations with example.
  - Define the following terms Entity, Attributes, Entity Sets, Cardinality and its types.
  - Discuss various DDL commands in SQL.
- Q.3 Attempt any two.** **16**
- Draw ER diagram for below scenario: A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
  - In SQL, explain the terms with syntax and example. SELECT, DISTINCT, WHERE, ORDERBY
  - List significant differences between a file-processing system and DBMS.

**Section - II**

- Q.4 Attempt any three** **12**
- Define functional dependency and need of normalization.
  - Explain the terms: Transaction, ACID Property
  - Explain the following terms with example; primary indexing and clustering indexing.
  - Discuss timestamp-based protocol.
- Q.5 Attempt any two** **16**
- Discuss types of normalization in detail with example.
  - Explain conflict serializability with example.
  - Consider following schedules involving two transactions:  
 S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)  
 S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
    - If given schedule is conflict serializable convert it into Conflict Serializable schedule.
    - If given schedule is not conflict serializable convert it into View Serializable Schedule.

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No.**

- 8) The binary relation  $\{(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)\}$  on the set  $\{1, 2, 3\}$  is \_\_\_\_\_.  
 a) reflexive, symmetric and transitive  
 b) irreflexive, symmetric and transitive  
 c) neither reflexive, nor irreflexive but transitive  
 d) irreflexive and antisymmetric
- 9) Determine the partitions of the set  $\{3, 4, 5, 6, 7\}$  from the following subsets.  
 a)  $\{3,5\}, \{3,6,7\}, \{4,5,6\}$                       b)  $\{3\}, \{4,6\}, \{5\}, \{7\}$   
 c)  $\{3,4,6\}, \{7\}$                                       d)  $\{5,6\}, \{5,7\}$
- 10) For an inverse to exist it is necessary that a function should be \_\_\_\_\_.  
 a) injection                                              b) bijection  
 c) surjection                                            d) none of the mentioned
- 11) Hasse diagrams are drawn for  
 a) Boolean Algebra                                      b) POSET  
 c) Lattices                                                d) For all
- 12) A group  $(M, *)$  is said to be abelian if \_\_\_\_\_.  
 a)  $(x + y) = (y + x)$                                       b)  $(x^* y) = (y^* x)$   
 c)  $(x + y) = x$                                             d)  $(y^* x) = (x + y)$
- 13) A monoid is called a group if \_\_\_\_\_.  
 a)  $(a^* a) = a = (a + c)$                                       b)  $(a^* c) = (a + c)$   
 c)  $(a + c) = a$                                             d)  $(a^* c) = (c^* a) = e$
- 14) A cyclic group is always \_\_\_\_\_.  
 a) abelian group                                              b) monoid  
 c) semigroup                                                d) subgroup

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Set **P**

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Discrete Mathematical Structures**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three** **12**

- Explain in detail composition of binary relation with example.
- Given the relation  $R$  on set  $X = \{1, 2, \dots, 7\}$   
 $R = \{ \langle x, y \rangle \mid (x - y) \text{ is divisible by } 3 \}$ , show that  $R$  is equivalence relation.
- Define following terms  
 i) Contradiction ii) WFF
- What is Tautological implication? Show the following implication.  
 $\neg P \wedge (P \vee Q) \Rightarrow Q$

**Q.3 Attempt any two.** **16**

- What is binary relation? List and define the properties of binary relation with example.
- What is partial ordering? Explain in detail partial ordered set representation with Hasse diagram.  
 Let  $X = \{2, 3, 6, 12, 24, 36\}$  and relation  $\leq$  be such that  $x \leq y$  if  $x$  divides  $y$ .  
 Draw Hasse diagram of  $\langle X, \leq \rangle$ .
- Obtain the PDNF of I and PCNF of II following statement formulas  
 i)  $(P \wedge Q) \vee (\neg p \wedge R) \vee (Q \wedge R)$   
 ii)  $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$

**Section - II**

**Q.4 Attempt any three** **12**

- Define semigroup and explain the homomorphism of semigroup with example.
- Write note on the following  
 1) subalgebra  
 2) sub-lattice
- Define and explain in detail Inverse function.
- Define group with an example.

**Q.5 Attempt any two** **16**

- Define Algebraic System & State its Properties.
- Define and explain in detail Composition of functions.  
 Let  $X = \{1, 2, 3\}$  and  $f, g, h$ , and  $s$  be functions from  $X$  to  $X$  given by  
 $f = \{ \langle 1, 2 \rangle, \langle 2, 3 \rangle, \langle 3, 1 \rangle \}$ ,  $g = \{ \langle 1, 2 \rangle, \langle 2, 1 \rangle, \langle 3, 3 \rangle \}$ ,  $h = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 1 \rangle \}$ ,  $s = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 3 \rangle \}$  find fog, gof, fohog, sog, gos, sos and fos.
- Explain with example function and their types.

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| Set Q |
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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Discrete Mathematical Structures**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

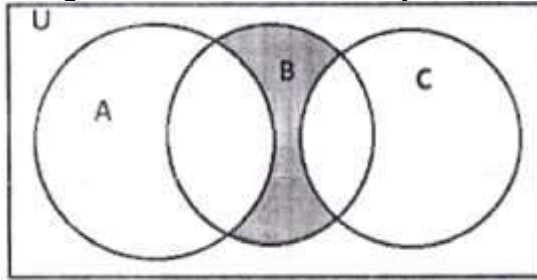
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The binary relation  $\{(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)\}$  on the set  $\{1, 2, 3\}$  is \_\_\_\_\_.  
 a) reflexive, symmetric and transitive  
 b) irreflexive, symmetric and transitive  
 c) neither reflexive, nor irreflexive but transitive  
 d) irreflexive and antisymmetric
- 2) Determine the partitions of the set  $\{3, 4, 5, 6, 7\}$  from the following subsets.  
 a)  $\{3,5\}, \{3,6,7\}, \{4,5,6\}$   
 b)  $\{3\}, \{4,6\}, \{5\}, \{7\}$   
 c)  $\{3,4,6\}, \{7\}$   
 d)  $\{5,6\}, \{5,7\}$
- 3) For an inverse to exist it is necessary that a function should be \_\_\_\_\_.  
 a) injection  
 b) bijection  
 c) surjection  
 d) none of the mentioned
- 4) Hasse diagrams are drawn for  
 a) Boolean Algebra  
 b) POSET  
 c) Lattices  
 d) For all
- 5) A group  $(M, *)$  is said to be abelian if \_\_\_\_\_.  
 a)  $(x + y) = (y + x)$   
 b)  $(x * y) = (y * x)$   
 c)  $(x + y) = x$   
 d)  $(y * x) = (x + y)$
- 6) A monoid is called a group if \_\_\_\_\_.  
 a)  $(a * a) = a = (a + c)$   
 b)  $(a * c) = (a + c)$   
 c)  $(a + c) = a$   
 d)  $(a * c) = (c * a) = e$
- 7) A cyclic group is always \_\_\_\_\_.  
 a) abelian group  
 b) monoid  
 c) semigroup  
 d) subgroup
- 8)  $A \rightarrow (A \vee q)$  is a \_\_\_\_\_.  
 a) Tautology  
 b) Contradiction  
 c) Contingency  
 d) None of the mentioned

- 9)  $\sim A \vee \sim B$  is logically equivalent to?  
 a)  $\sim A \rightarrow \sim B$  b)  $\sim A \wedge \sim B$   
 c)  $A \rightarrow \sim B$  d)  $B \vee A$
- 10) The contrapositive of  $p \rightarrow q$  is the proposition of \_\_\_\_\_.  
 a)  $\neg p \rightarrow \neg q$  b)  $\neg q \rightarrow \neg p$   
 c)  $q \rightarrow p$  d)  $\neg q \rightarrow p$
- 11) PCNF is also called \_\_\_\_\_.  
 a) sum of product canonical form b) product of sum canonical form  
 c) sum canonical form d) product canonical form
- 12) What is the Cartesian product of  $A = \{1, 2\}$  and  $B = \{a, b\}$ ?  
 a)  $\{ \langle 1, a \rangle, \langle 1, b \rangle, \langle 2, a \rangle, \langle 2, b \rangle \}$   
 b)  $\{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle a, a \rangle, \langle b, b \rangle \}$   
 c)  $\{ \langle 1, a \rangle, \langle 2, a \rangle, \langle 1, b \rangle, \langle 2, b \rangle \}$   
 d)  $\{ \langle 1, 1 \rangle, \langle a, a \rangle, \langle 2, a \rangle, \langle 1, b \rangle \}$
- 13) The shaded area of figure is best described by?



- a)  $A \setminus (\text{Complement of } A)$  b)  $B - (A \cap B) - (C \cap B)$   
 c)  $A \cap C \cap B$  d)  $B \setminus (\text{Complement of } B)$
- 14) If set  $C$  is  $\{1, 2, 3, 4\}$  and  $C - D = \Phi$  then set  $D$  can be \_\_\_\_\_.  
 a)  $\{1, 2, 4, 5\}$  b)  $\{1, 2, 3\}$   
 c)  $\{1, 2, 3, 4, 5\}$  d) None of the mentioned



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Set **Q**

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Discrete Mathematical Structures**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three** **12**

- Explain in detail composition of binary relation with example.
- Given the relation  $R$  on set  $X = \{1, 2, \dots, 7\}$   
 $R = \{ \langle x, y \rangle \mid (x - y) \text{ is divisible by } 3 \}$ , show that  $R$  is equivalence relation.
- Define following terms  
 i) Contradiction ii) WFF
- What is Tautological implication? Show the following implication.  
 $\neg P \wedge (P \vee Q) \Rightarrow Q$

**Q.3 Attempt any two.** **16**

- What is binary relation? List and define the properties of binary relation with example.
- What is partial ordering? Explain in detail partial ordered set representation with Hasse diagram.  
 Let  $X = \{2, 3, 6, 12, 24, 36\}$  and relation  $\leq$  be such that  $x \leq y$  if  $x$  divides  $y$ .  
 Draw Hasse diagram of  $\langle X, \leq \rangle$ .
- Obtain the PDNF of I and PCNF of II following statement formulas  
 i)  $(P \wedge Q) \vee (\neg p \wedge R) \vee (Q \wedge R)$   
 ii)  $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$

**Section - II**

**Q.4 Attempt any three** **12**

- Define semigroup and explain the homomorphism of semigroup with example.
- Write note on the following  
 1) subalgebra  
 2) sub-lattice
- Define and explain in detail Inverse function.
- Define group with an example.

**Q.5 Attempt any two** **16**

- Define Algebraic System & State its Properties.
- Define and explain in detail Composition of functions.  
 Let  $X = \{1, 2, 3\}$  and  $f, g, h$ , and  $s$  be functions from  $X$  to  $X$  given by  
 $f = \{ \langle 1, 2 \rangle, \langle 2, 3 \rangle, \langle 3, 1 \rangle \}$ ,  $g = \{ \langle 1, 2 \rangle, \langle 2, 1 \rangle, \langle 3, 3 \rangle \}$ ,  $h = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 1 \rangle \}$ ,  $s = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 3 \rangle \}$  find fog, gof, fohog, sog, gos, sos and fos.
- Explain with example function and their types.

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Set **R**

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Discrete Mathematical Structures**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Hasse diagrams are drawn for
 

|                    |            |
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| a) Boolean Algebra | b) POSET   |
| c) Lattices        | d) For all |
- 2) A group  $(M, *)$  is said to be abelian if \_\_\_\_\_.
 

|                        |                        |
|------------------------|------------------------|
| a) $(x + y) = (y + x)$ | b) $(x^* y) = (y^* x)$ |
| c) $(x + y) = x$       | d) $(y^* x) = (x + y)$ |
- 3) A monoid is called a group if \_\_\_\_\_.
 

|                            |                            |
|----------------------------|----------------------------|
| a) $(a^* a) = a = (a + c)$ | b) $(a^* c) = (a + c)$     |
| c) $(a + c) = a$           | d) $(a^* c) = (c^* a) = e$ |
- 4) A cyclic group is always \_\_\_\_\_.
 

|                  |             |
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| a) abelian group | b) monoid   |
| c) semigroup     | d) subgroup |
- 5)  $A \rightarrow (A \vee q)$  is a \_\_\_\_\_.
 

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| a) Tautology   | b) Contradiction         |
| c) Contingency | d) None of the mentioned |
- 6)  $\sim A \vee \sim B$  is logically equivalent to?
 

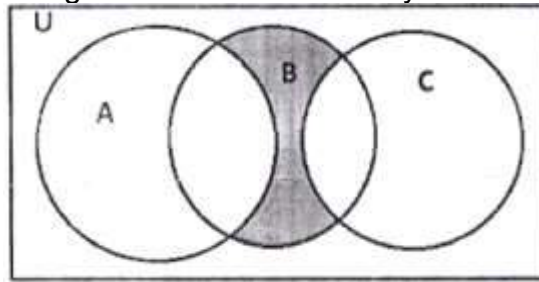
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| a) $\sim A \rightarrow \sim B$ | b) $\sim A \wedge \sim B$ |
| c) $A \rightarrow \sim B$      | d) $B \vee A$             |
- 7) The contrapositive of  $p \rightarrow q$  is the proposition of \_\_\_\_\_.
 

|                                |                                |
|--------------------------------|--------------------------------|
| a) $\neg p \rightarrow \neg q$ | b) $\neg q \rightarrow \neg p$ |
| c) $q \rightarrow p$           | d) $\neg q \rightarrow p$      |
- 8) PCNF is also called \_\_\_\_\_.
 

|                                  |                                  |
|----------------------------------|----------------------------------|
| a) sum of product canonical form | b) product of sum canonical form |
| c) sum canonical form            | d) product canonical form        |
- 9) What is the Cartesian product of  $A = \{1, 2\}$  and  $B = \{a, b\}$ ?
 

|                                                                                                   |
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| a) $\{ \langle 1, a \rangle, \langle 1, b \rangle, \langle 2, a \rangle, \langle 2, b \rangle \}$ |
| b) $\{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle a, a \rangle, \langle b, b \rangle \}$ |
| c) $\{ \langle 1, a \rangle, \langle 2, a \rangle, \langle 1, b \rangle, \langle 2, b \rangle \}$ |
| d) $\{ \langle 1, 1 \rangle, \langle a, a \rangle, \langle 2, a \rangle, \langle 1, b \rangle \}$ |

- 10) The shaded area of figure is best described by?



- a)  $A'$  (Complement of A)                      b)  $B - (A \cap B) - (C \cap B)$   
 c)  $A \cap C \cap B$                                   d)  $B'$  (Complement of B)
- 11) If set  $C$  is  $\{1, 2, 3, 4\}$  and  $C - D = \Phi$  then set  $D$  can be \_\_\_\_\_.  
 a)  $\{1, 2, 4, 5\}$                                       b)  $\{1, 2, 3\}$   
 c)  $\{1, 2, 3, 4, 5\}$                                   d) None of the mentioned
- 12) The binary relation  $\{(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)\}$  on the set  $\{1, 2, 3\}$  is \_\_\_\_\_.  
 a) reflexive, symmetric and transitive  
 b) irreflexive, symmetric and transitive  
 c) neither reflexive, nor irreflexive but transitive  
 d) irreflexive and antisymmetric
- 13) Determine the partitions of the set  $\{3, 4, 5, 6, 7\}$  from the following subsets.  
 a)  $\{3,5\}, \{3,6,7\}, \{4,5,6\}$                       b)  $\{3\}, \{4,6\}, \{5\}, \{7\}$   
 c)  $\{3,4,6\}, \{7\}$                                       d)  $\{5,6\}, \{5,7\}$
- 14) For an inverse to exist it is necessary that a function should be \_\_\_\_\_.  
 a) injection                                              b) bijection  
 c) surjection                                              d) none of the mentioned

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Set **R**

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Discrete Mathematical Structures**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three** **12**

- Explain in detail composition of binary relation with example.
- Given the relation  $R$  on set  $X = \{1, 2, \dots, 7\}$   
 $R = \{ \langle x, y \rangle \mid (x - y) \text{ is divisible by } 3 \}$ , show that  $R$  is equivalence relation.
- Define following terms  
 i) Contradiction ii) WFF
- What is Tautological implication? Show the following implication.  
 $\neg P \wedge (P \vee Q) \Rightarrow Q$

**Q.3 Attempt any two.** **16**

- What is binary relation? List and define the properties of binary relation with example.
- What is partial ordering? Explain in detail partial ordered set representation with Hasse diagram.  
 Let  $X = \{2, 3, 6, 12, 24, 36\}$  and relation  $\leq$  be such that  $x \leq y$  if  $x$  divides  $y$ .  
 Draw Hasse diagram of  $\langle X, \leq \rangle$ .
- Obtain the PDNF of I and PCNF of II following statement formulas  
 i)  $(P \wedge Q) \vee (\neg p \wedge R) \vee (Q \wedge R)$   
 ii)  $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$

**Section - II**

**Q.4 Attempt any three** **12**

- Define semigroup and explain the homomorphism of semigroup with example.
- Write note on the following  
 1) subalgebra  
 2) sub-lattice
- Define and explain in detail Inverse function.
- Define group with an example.

**Q.5 Attempt any two** **16**

- Define Algebraic System & State its Properties.
- Define and explain in detail Composition of functions.  
 Let  $X = \{1, 2, 3\}$  and  $f, g, h$ , and  $s$  be functions from  $X$  to  $X$  given by  
 $f = \{ \langle 1, 2 \rangle, \langle 2, 3 \rangle, \langle 3, 1 \rangle \}$ ,  $g = \{ \langle 1, 2 \rangle, \langle 2, 1 \rangle, \langle 3, 3 \rangle \}$ ,  $h = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 1 \rangle \}$ ,  $s = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 3 \rangle \}$  find fog, gof, fohog, sog, gos, sos and fos.
- Explain with example function and their types.

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Discrete Mathematical Structures**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

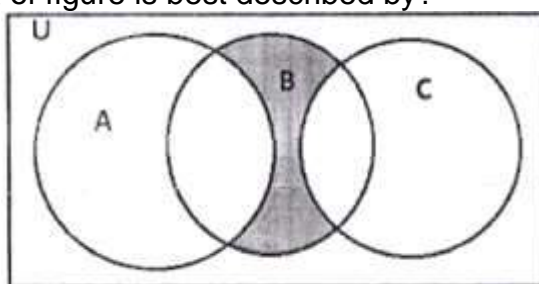
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The shaded area of figure is best described by?



- |                           |                                  |
|---------------------------|----------------------------------|
| a) $A'$ (Complement of A) | b) $B - (A \cap B) - (C \cap B)$ |
| c) $A \cap C \cap B$      | d) $B'$ (Complement of B)        |
- 2) If set  $C$  is  $\{1, 2, 3, 4\}$  and  $C - D = \Phi$  then set  $D$  can be \_\_\_\_\_.  
 a)  $\{1, 2, 4, 5\}$                       b)  $\{1, 2, 3\}$   
 c)  $\{1, 2, 3, 4, 5\}$                   d) None of the mentioned
- 3) The binary relation  $\{(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)\}$  on the set  $\{1, 2, 3\}$  is \_\_\_\_\_.  
 a) reflexive, symmetric and transitive  
 b) irreflexive, symmetric and transitive  
 c) neither reflexive, nor irreflexive but transitive  
 d) irreflexive and antisymmetric
- 4) Determine the partitions of the set  $\{3, 4, 5, 6, 7\}$  from the following subsets.  
 a)  $\{3,5\}, \{3,6,7\}, \{4,5,6\}$                       b)  $\{3\}, \{4,6\}, \{5\}, \{7\}$   
 c)  $\{3,4,6\}, \{7\}$                                   d)  $\{5,6\}, \{5,7\}$
- 5) For an inverse to exist it is necessary that a function should be \_\_\_\_\_.  
 a) injection                                          b) bijection  
 c) surjection                                        d) none of the mentioned
- 6) Hasse diagrams are drawn for  
 a) Boolean Algebra                                  b) POSET  
 c) Lattices                                            d) For all

- 7) A group  $(M, *)$  is said to be abelian if \_\_\_\_\_.  
 a)  $(x + y) = (y + x)$                       b)  $(x^* y) = (y^* x)$   
 c)  $(x + y) = x$                               d)  $(y^* x) = (x + y)$
- 8) A monoid is called a group if \_\_\_\_\_.  
 a)  $(a^* a) = a = (a + c)$                       b)  $(a^* c) = (a + c)$   
 c)  $(a + c) = a$                                   d)  $(a^* c) = (c^* a) = e$
- 9) A cyclic group is always \_\_\_\_\_.  
 a) abelian group                                  b) monoid  
 c) semigroup                                      d) subgroup
- 10)  $A \rightarrow (A \vee q)$  is a \_\_\_\_\_.  
 a) Tautology                                      b) Contradiction  
 c) Contingency                                  d) None of the mentioned
- 11)  $\sim A \vee \sim B$  is logically equivalent to?  
 a)  $\sim A \rightarrow \sim B$                                   b)  $\sim A \wedge \sim B$   
 c)  $A \rightarrow \sim B$                                       d)  $B \vee A$
- 12) The contrapositive of  $p \rightarrow q$  is the proposition of \_\_\_\_\_.  
 a)  $\neg p \rightarrow \neg q$                                   b)  $\neg q \rightarrow \neg p$   
 c)  $q \rightarrow p$                                           d)  $\neg q \rightarrow p$
- 13) PCNF is also called \_\_\_\_\_.  
 a) sum of product canonical form              b) product of sum canonical form  
 c) sum canonical form                              d) product canonical form
- 14) What is the Cartesian product of  $A = \{1, 2\}$  and  $B = \{a, b\}$ ?  
 a)  $\{< 1, a >, < 1, b >, < 2, a >, < 2, b >\}$   
 b)  $\{< 1, 1 >, < 2, 2 >, < a, a >, < b, b >\}$   
 c)  $\{< 1, a >, < 2, a >, < 1, b >, < 2, b >\}$   
 d)  $\{< 1, 1 >, < a, a >, < 2, a >, < 1, b >\}$

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Set **S**

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Discrete Mathematical Structures**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three** **12**

- Explain in detail composition of binary relation with example.
- Given the relation  $R$  on set  $X = \{1, 2, \dots, 7\}$   
 $R = \{ \langle x, y \rangle \mid (x - y) \text{ is divisible by } 3 \}$ , show that  $R$  is equivalence relation.
- Define following terms  
 i) Contradiction ii) WFF
- What is Tautological implication? Show the following implication.  
 $\neg P \wedge (P \vee Q) \Rightarrow Q$

**Q.3 Attempt any two.** **16**

- What is binary relation? List and define the properties of binary relation with example.
- What is partial ordering? Explain in detail partial ordered set representation with Hasse diagram.  
 Let  $X = \{2, 3, 6, 12, 24, 36\}$  and relation  $\leq$  be such that  $x \leq y$  if  $x$  divides  $y$ .  
 Draw Hasse diagram of  $\langle X, \leq \rangle$ .
- Obtain the PDNF of I and PCNF of II following statement formulas  
 i)  $(P \wedge Q) \vee (\neg p \wedge R) \vee (Q \wedge R)$   
 ii)  $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$

**Section - II**

**Q.4 Attempt any three** **12**

- Define semigroup and explain the homomorphism of semigroup with example.
- Write note on the following  
 1) subalgebra  
 2) sub-lattice
- Define and explain in detail Inverse function.
- Define group with an example.

**Q.5 Attempt any two** **16**

- Define Algebraic System & State its Properties.
- Define and explain in detail Composition of functions.  
 Let  $X = \{1, 2, 3\}$  and  $f, g, h$ , and  $s$  be functions from  $X$  to  $X$  given by  
 $f = \{ \langle 1, 2 \rangle, \langle 2, 3 \rangle, \langle 3, 1 \rangle \}$ ,  $g = \{ \langle 1, 2 \rangle, \langle 2, 1 \rangle, \langle 3, 3 \rangle \}$ ,  $h = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 1 \rangle \}$ ,  $s = \{ \langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 3 \rangle \}$  find fog, gof, fohog, sog, gos, sos and fos.
- Explain with example function and their types.

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| Set | P |
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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data structures**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which one of the following is an application of Stack Data Structure?  
 a) Managing function calls  
 b) The stock span problem  
 c) Arithmetic expression evaluation  
 d) All of the above
- 2) A hash table of length 10 uses open addressing with hash function  $h(k)=k \bmod 10$ , and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.

|   |    |
|---|----|
| 0 |    |
| 1 |    |
| 2 | 42 |
| 3 | 23 |
| 4 | 34 |
| 5 | 52 |
| 6 | 46 |
| 7 | 33 |
| 8 |    |
| 9 |    |

Which one of the following choices gives a possible order in which the key values could have been inserted in the table?

- a) 46, 42, 34, 52, 23, 33      b) 34, 42, 23, 52, 33, 46  
 c) 46, 34, 42, 23, 52, 33      d) 42, 46, 33, 23, 34, 52
- 3) Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?
- a) 7 5 1 0 3 2 4 6 8 9      b) 0 2 4 3 1 6 5 9 8 7  
 c) 0 1 2 3 4 5 6 7 8 9      d) 9 8 6 4 2 3 0 1 5 7



- 4) B+ Trees are considered BALANCED because
  - a) the lengths of the paths from the root to all leaf nodes are all equal.
  - b) the lengths of the paths from the root to all leaf nodes differ from each other by at most 1.
  - c) the number of children of any two non-leaf sibling nodes differ by at most 1.
  - d) the number of records in any two leaf nodes differ by at most 1
- 5) An advantage of chained hash table (external hashing) over the open addressing scheme is
  - a) Worst case complexity of search operations is less
  - b) Space used is less
  - c) Deletion is easier
  - d) None of the above
- 6) In \_\_\_\_\_ searching technique records must be in sorted order.
  - a) Hashing
  - b) Binary search
  - c) Linear search
  - d) Tree search
- 7) Two main measures for the efficiency of an algorithm are \_\_\_\_\_.
  - a) Processor and memory
  - b) Complexity and capacity
  - c) Time and space
  - d) Data and space
- 8) Quick sort running time depends on the selection of
  - a) size of array
  - b) pivot element
  - c) sequence of values
  - d) none of the above
- 9) Dijkstra algorithm is used for finding \_\_\_\_\_.
  - a) Cycle in the graph
  - b) Topological sort
  - c) shortest path
  - d) Tree in a graph
- 10) Which one of the following data structures are preferred in database-system implementation?
  - a) AVL tree
  - b) B tree
  - c) B+ tree
  - d) Splay tree
- 11) Which of the following is the prefix form of  $A+B*C$ ?
  - a)  $A+(BC^*)$
  - b)  $+AB^*C$
  - c)  $ABC+^*$
  - d)  $+A^*BC$
- 12) If the elements '1', '2', '3' and '4' are added in a stack, so what would be the order for the removal?
  - a) 1234
  - b) 2134
  - c) 4321
  - d) None of the above
- 13) Which of the following is the time complexity to search an element in the linked list?
  - a)  $O(1)$
  - b)  $O(n)$
  - c)  $O(\log n)$
  - d)  $O(n \log n)$
- 14) How can we define a AVL tree?
  - a) A tree which is binary search tree and height balanced tree
  - b) A tree which is a binary search tree but unbalanced tree.
  - c) A tree with utmost two children
  - d) A tree with utmost three children

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data structures**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four** **20**

- a) Perform Bubble sort (ascending) of following numbers. Show every iteration.  
 $A = \{15, 3, 21, 5, 11, 45, 15\}$
- b) Perform quick sort (ascending) of following numbers-show every iteration  
 18, 16, 4, 15, 16, 9, 7, 8, 3
- c) Write a short note on the collision resolution technique of Linear Probing for the following elements 15,22,35,33,41,36,57,9
- d) Define queue. Explain operations of queue using array?
- e) Elaborate about Singly Linked List.
  - i) Node Structure
  - ii) Inserting a node at the end
  - iii) Deleting a node from Beginning

**Q.3 Attempt any one.** **08**

- a) How an infix expression is converted to postfix using stack? Convert following expression into postfix by providing proper explanation and showing the content of stack?  $(A + B) * C / D + E \wedge F / G$
- b) Explain Merge Sort along with its working for the following example 1, 6, 3, 2, 7, 5, 8, 4. Also write a pseudocode(or program) for merge and mergesort functions

**Section - II**

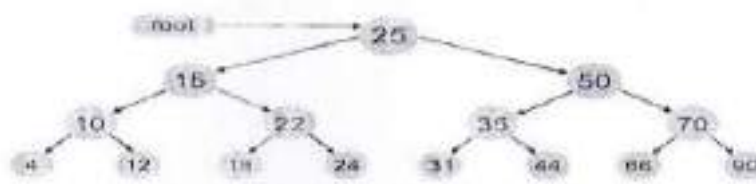
**Q.4 Attempt any four** **20**

- a) Define following terms
  - i) Height of the tree
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- b) Construct a Binary tree with following given orders. (Give proper explanation)  
 Preorder= ABDGHEICFJK  
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- d) Define following terminologies in Graph
- neighbours
  - degree of a node
  - regular graph
  - path
  - Cycle
- e) Explain Multiway Tree with a proper diagram. Also explain how multiway tree are a useful data structure with its applications

**Q.5 Attempt any one****08**

- a) With proper explanation find Inorder, Preorder and Post order Traversal of the following tree.



- b) Explain AVL Tree with all types of rotation and also construct AVL tree for the following example 21,26,30,9,4,14,28,18,15,10,2,3,7

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data structures**

Day & Date: Friday, 17-03-2023  
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Max. Marks: 70

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Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data structures**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
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**Section – I**

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**Section - II**

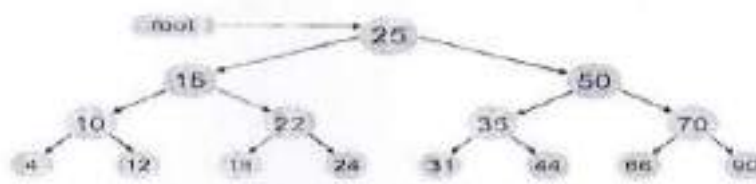
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**Seat  
No.**

Max. Marks: 70

Marks: 14

14

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|---|----|
| 0 |    |
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 c) B+ tree                                              d) Splay tree

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data structures**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
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**Section – I**

**Q.2 Attempt any four** **20**

- a) Perform Bubble sort (ascending) of following numbers. Show every iteration.  
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  - i) Node Structure
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  - iii) Deleting a node from Beginning

**Q.3 Attempt any one.** **08**

- a) How an infix expression is converted to postfix using stack? Convert following expression into postfix by providing proper explanation and showing the content of stack?  $(A + B) * C / D + E \wedge F / G$
- b) Explain Merge Sort along with its working for the following example 1, 6, 3, 2, 7, 5, 8, 4. Also write a pseudocode(or program) for merge and mergesort functions

**Section - II**

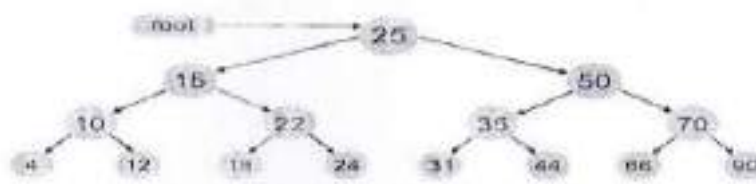
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  - degree of a node
  - regular graph
  - path
  - Cycle
- e) Explain Multiway Tree with a proper diagram. Also explain how multiway tree are a useful data structure with its applications

**Q.5 Attempt any one****08**

- a) With proper explanation find Inorder, Preorder and Post order Traversal of the following tree.



- b) Explain AVL Tree with all types of rotation and also construct AVL tree for the following example 21,26,30,9,4,14,28,18,15,10,2,3,7

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data structures**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In \_\_\_\_\_ searching technique records must be in sorted order.
  - a) Hashing
  - b) Binary search
  - c) Linear search
  - d) Tree search
- 2) Two main measures for the efficiency of an algorithm are \_\_\_\_\_.
  - a) Processor and memory
  - b) Complexity and capacity
  - c) Time and space
  - d) Data and space
- 3) Quick sort running time depends on the selection of
  - a) size of array
  - b) pivot element
  - c) sequence of values
  - d) none of the above
- 4) Dijkstra algorithm is used for finding \_\_\_\_\_.
  - a) Cycle in the graph
  - b) Topological sort
  - c) shortest path
  - d) Tree in a graph
- 5) Which one of the following data structures are preferred in database-system implementation?
  - a) AVL tree
  - b) B tree
  - c) B+ tree
  - d) Splay tree
- 6) Which of the following is the prefix form of  $A+B*C$ ?
  - a)  $A+(BC^*)$
  - b)  $+AB^*C$
  - c)  $ABC+^*$
  - d)  $+A^*BC$
- 7) If the elements '1', '2', '3' and '4' are added in a stack, so what would be the order for the removal?
  - a) 1234
  - b) 2134
  - c) 4321
  - d) None of the above
- 8) Which of the following is the time complexity to search an element in the linked list?
  - a)  $O(1)$
  - b)  $O(n)$
  - c)  $O(\log n)$
  - d)  $O(n \log n)$

- 9) How can we define a AVL tree?
- A tree which is binary search tree and height balanced tree
  - A tree which is a binary search tree but unbalanced tree.
  - A tree with utmost two children
  - A tree with utmost three children
- 10) Which one of the following is an application of Stack Data Structure?
- Managing function calls
  - The stock span problem
  - Arithmetic expression evaluation
  - All of the above
- 11) A hash table of length 10 uses open addressing with hash function  $h(k)=k \bmod 10$ , and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.

|   |    |
|---|----|
| 0 |    |
| 1 |    |
| 2 | 42 |
| 3 | 23 |
| 4 | 34 |
| 5 | 52 |
| 6 | 46 |
| 7 | 33 |
| 8 |    |
| 9 |    |

Which one of the following choices gives a possible order in which the key values could have been inserted in the table?

- 46, 42, 34, 52, 23, 33
  - 34, 42, 23, 52, 33, 46
  - 46, 34, 42, 23, 52, 33
  - 42, 46, 33, 23, 34, 52
- 12) Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?
- 7 5 1 0 3 2 4 6 8 9
  - 0 2 4 3 1 6 5 9 8 7
  - 0 1 2 3 4 5 6 7 8 9
  - 9 8 6 4 2 3 0 1 5 7
- 13) B+ Trees are considered BALANCED because
- the lengths of the paths from the root to all leaf nodes are all equal.
  - the lengths of the paths from the root to all leaf nodes differ from each other by at most 1.
  - the number of children of any two non-leaf sibling nodes differ by at most 1.
  - the number of records in any two leaf nodes differ by at most 1
- 14) An advantage of chained hash table (external hashing) over the open addressing scheme is
- Worst case complexity of search operations is less
  - Space used is less
  - Deletion is easier
  - None of the above

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| Set | S |
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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data structures**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four** **20**

- a) Perform Bubble sort (ascending) of following numbers. Show every iteration.  
 $A = \{15, 3, 21, 5, 11, 45, 15\}$
- b) Perform quick sort (ascending) of following numbers-show every iteration  
 18, 16, 4, 15, 16, 9, 7, 8, 3
- c) Write a short note on the collision resolution technique of Linear Probing for the following elements 15, 22, 35, 33, 41, 36, 57, 9
- d) Define queue. Explain operations of queue using array?
- e) Elaborate about Singly Linked List.
  - i) Node Structure
  - ii) Inserting a node at the end
  - iii) Deleting a node from Beginning

**Q.3 Attempt any one.** **08**

- a) How an infix expression is converted to postfix using stack? Convert following expression into postfix by providing proper explanation and showing the content of stack?  $(A + B) * C / D + E \wedge F / G$
- b) Explain Merge Sort along with its working for the following example 1, 6, 3, 2, 7, 5, 8, 4. Also write a pseudocode(or program) for merge and mergesort functions

**Section - II**

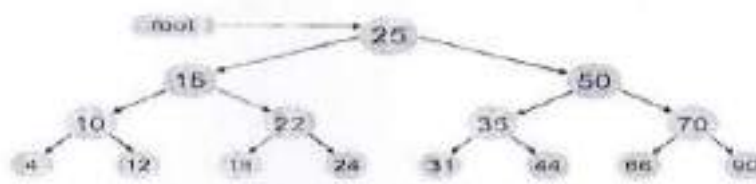
**Q.4 Attempt any four** **20**

- a) Define following terms
  - i) Height of the tree
  - ii) Level of the tree
  - iii) Full binary tree
  - iv) complete binary tree
  - v) perfect binary tree
- b) Construct a Binary tree with following given orders. (Give proper explanation)  
 Preorder= ABDGHEICFJK  
 InOrder= GDHBEIACJFK
- c) Define the graph And explain Adjacency List and Adjacency Matrix Graph Representation of graph

- d) Define following terminologies in Graph
- neighbours
  - degree of a node
  - regular graph
  - path
  - Cycle
- e) Explain Multiway Tree with a proper diagram. Also explain how multiway tree are a useful data structure with its applications

**Q.5 Attempt any one****08**

- a) With proper explanation find Inorder, Preorder and Post order Traversal of the following tree.



- b) Explain AVL Tree with all types of rotation and also construct AVL tree for the following example 21,26,30,9,4,14,28,18,15,10,2,3,7

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is correct for microprocessor Intel 8085?
 

|                         |                          |
|-------------------------|--------------------------|
| a) 8 bit microprocessor | b) 16 bit microprocessor |
| c) 4 bit microprocessor | d) 32 bit microprocessor |
- 2) Which of the following is used for storing flag registers?
 

|                    |                          |
|--------------------|--------------------------|
| a) Status register | b) Control register      |
| c) Buffer register | d) None of the mentioned |
- 3) 8086 can access up to?
 

|          |          |
|----------|----------|
| a) 512KB | b) 1Mb   |
| c) 2Mb   | d) 256KB |
- 4) The instruction, MOV AX, [BX] is an example of \_\_\_\_\_.
 

|                                      |
|--------------------------------------|
| a) direct addressing mode            |
| b) register addressing mode          |
| c) register relative addressing mode |
| d) register indirect addressing mode |
- 5) The instruction, "INC" increases the contents of the specified register or memory location by
 

|      |      |
|------|------|
| a) 2 | b) 0 |
| c) 1 | d) 3 |
- 6) The directive that marks the end of a logical segment is \_\_\_\_\_.
 

|               |                  |
|---------------|------------------|
| a) ENDS       | b) END           |
| c) ENDS & END | d) None of these |
- 7) NMI stands for \_\_\_\_\_.
 

|                           |                           |
|---------------------------|---------------------------|
| a) non maskable interrupt | b) non multiple interrupt |
| c) non movable interrupt  | d) none of the mentioned  |
- 8) Port C of 8255 can function independently as \_\_\_\_\_.
 

|                                 |                                |
|---------------------------------|--------------------------------|
| a) input port                   | b) output port                 |
| c) either input or output ports | d) both input and output ports |
- 9) The data bus buffer is controlled by \_\_\_\_\_.
 

|                          |                             |
|--------------------------|-----------------------------|
| a) control word register | b) read/write control logic |
| c) data bus              | d) none of the mentioned    |



- 10) Mode 0 is also called as \_\_\_\_\_.
  - a) Simple I/O mode
  - b) Strobed I/O mode 18
  - c) Bidirectional I/O mode
  - d) None of these
- 11) The unit that executes all the numeric processor instructions in 8087 is \_\_\_\_\_.
  - a) Control unit
  - b) ALU
  - c) Numeric extension unit
  - d) None of the mentioned
- 12) The flags that are used for controlling machine operation are called \_\_\_\_\_.
  - a) status flags
  - b) control flags
  - c) machine controlled flags
  - d) all of the mentioned
- 13) The CPU of 80286 contains \_\_\_\_\_.
  - a) 16-bit general purpose registers
  - b) 16-bit segment registers
  - c) status and control register
  - d) all of the mentioned
- 14) The strobed input/output mode is another name of \_\_\_\_\_.
  - a) mode 0
  - b) mode 1
  - c) mode 2
  - d) none

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Three) 12**

- a) Explain flag Registers of 8085.
- b) What are different types of Addressing Modes explain with example.
- c) Explain Directives in 8086.
- d) Explain PUSH, POP, OUT, HLT instruction.

**Q.3 Draw and explain architecture of 8086. 08**

**Q.4 Draw and explain minimum mode of 8086. 08**

**OR**

Write a assembly language program to perform addition subtraction of two 16 bit data.

**Section – II**

**Q.5 Answer the following question. (Any Three) 12**

- a) Differentiate between makeable and nonmaskable interrupt.
- b) Explain following.
  - 1) ISR
  - 2) IRR
  - 3) IMR
  - 4) Priority Resolver
- c) Write down features of 8255.
- d) What are different numeric data types.

**Q.6 Draw and explain block diagram of 8257 DMA controller. 08**

**Q.7 Explain following operating mode of 8257. 08**

- a) Rotating operating mode
- b) Fixed operating mode
- c) Auto load operating mode
- d) Extended write mode

**OR**

Draw and explain block diagram of 80286.

|                 |  |
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| <b>Seat No.</b> |  |
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- 10) 8086 can access up to?  
a) 512KB  
b) 1Mb  
c) 2Mb  
d) 256KB
- 11) The instruction, MOV AX, [BX] is an example of \_\_\_\_\_.  
a) direct addressing mode  
b) register addressing mode  
c) register relative addressing mode  
d) register indirect addressing mode
- 12) The instruction, "INC" increases the contents of the specified register or memory location by  
a) 2  
b) 0  
c) 1  
d) 3
- 13) The directive that marks the end of a logical segment is \_\_\_\_\_.  
a) ENDS  
b) END  
c) ENDS & END  
d) None of these
- 14) NMI stands for \_\_\_\_\_.  
a) non maskable interrupt  
b) non multiple interrupt  
c) non movable interrupt  
d) none of the mentioned

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Three) 12**

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- What are different types of Addressing Modes explain with example.
- Explain Directives in 8086.
- Explain PUSH, POP, OUT, HLT instruction.

**Q.3 Draw and explain architecture of 8086. 08**

**Q.4 Draw and explain minimum mode of 8086. 08**

**OR**

Write a assembly language program to perform addition subtraction of two 16 bit data.

**Section – II**

**Q.5 Answer the following question. (Any Three) 12**

- Differentiate between makeable and nonmaskable interrupt.
- Explain following.
  - ISR
  - IRR
  - IMR
  - Priority Resolver
- Write down features of 8255.
- What are different numeric data types.

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- Rotating operating mode
- Fixed operating mode
- Auto load operating mode
- Extended write mode

**OR**

Draw and explain block diagram of 80286.

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| <b>Seat No.</b> |  |
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- 9) The instruction, "INC" increases the contents of the specified register or memory location by
  - a) 2
  - b) 0
  - c) 1
  - d) 3
- 10) The directive that marks the end of a logical segment is \_\_\_\_\_.
  - a) ENDS
  - b) END
  - c) ENDS & END
  - d) None of these
- 11) NMI stands for \_\_\_\_\_.
  - a) non maskable interrupt
  - b) non multiple interrupt
  - c) non movable interrupt
  - d) none of the mentioned
- 12) Port C of 8255 can function independently as \_\_\_\_\_.
  - a) input port
  - b) output port
  - c) either input or output ports
  - d) both input and output ports
- 13) The data bus buffer is controlled by \_\_\_\_\_.
  - a) control word register
  - b) read/write control logic
  - c) data bus
  - d) none of the mentioned
- 14) Mode 0 is also called as \_\_\_\_\_.
  - a) Simple I/O mode
  - b) Strobed I/O mode 18
  - c) Bidirectional I/O mode
  - d) None of these

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day &amp; Date: Tuesday, 21-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Three) 12**

- Explain flag Registers of 8085.
- What are different types of Addressing Modes explain with example.
- Explain Directives in 8086.
- Explain PUSH, POP, OUT, HLT instruction.

**Q.3 Draw and explain architecture of 8086. 08**

**Q.4 Draw and explain minimum mode of 8086. 08**

**OR**

Write a assembly language program to perform addition subtraction of two 16 bit data.

**Section – II**

**Q.5 Answer the following question. (Any Three) 12**

- Differentiate between makeable and nonmaskable interrupt.
- Explain following.
  - ISR
  - IRR
  - IMR
  - Priority Resolver
- Write down features of 8255.
- What are different numeric data types.

**Q.6 Draw and explain block diagram of 8257 DMA controller. 08**

**Q.7 Explain following operating mode of 8257. 08**

- Rotating operating mode
- Fixed operating mode
- Auto load operating mode
- Extended write mode

**OR**

Draw and explain block diagram of 80286.



**Seat  
No.**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The directive that marks the end of a logical segment is \_\_\_\_\_.  
a) ENDS                                          b) END  
c) ENDS & END                                d) None of these
- 2) NMI stands for \_\_\_\_\_.  
a) non maskable interrupt                      b) non multiple interrupt  
c) non movable interrupt                      d) none of the mentioned
- 3) Port C of 8255 can function independently as \_\_\_\_\_.  
a) input port                                      b) output port  
c) either input or output ports                d) both input and output ports
- 4) The data bus buffer is controlled by \_\_\_\_\_.  
a) control word register                        b) read/write control logic  
c) data bus                                        d) none of the mentioned
- 5) Mode 0 is also called as \_\_\_\_\_.  
a) Simple I/O mode                              b) Strobed I/O mode 18  
c) Bidirectional I/O mode                      d) None of these
- 6) The unit that executes all the numeric processor instructions in 8087 is \_\_\_\_\_.  
a) Control unit                                    b) ALU  
c) Numeric extension unit                      d) None of the mentioned
- 7) The flags that are used for controlling machine operation are called \_\_\_\_\_.  
a) status flags                                    b) control flags  
c) machine controlled flags                    d) all of the mentioned
- 8) The CPU of 80286 contains \_\_\_\_\_.  
a) 16-bit general purpose registers  
b) 16-bit segment registers  
c) status and control register  
d) all of the mentioned
- 9) The strobed input/output mode is another name of \_\_\_\_\_.  
a) mode 0                                          b) mode 1  
c) mode 2                                          d) none

- 10)** Which of the following is correct for microprocessor Intel 8085?
- |                         |                          |
|-------------------------|--------------------------|
| a) 8 bit microprocessor | b) 16 bit microprocessor |
| c) 4 bit microprocessor | d) 32 bit microprocessor |
- 11)** Which of the following is used for storing flag registers?
- |                    |                          |
|--------------------|--------------------------|
| a) Status register | b) Control register      |
| c) Buffer register | d) None of the mentioned |
- 12)** 8086 can access up to?
- |          |          |
|----------|----------|
| a) 512KB | b) 1Mb   |
| c) 2Mb   | d) 256KB |
- 13)** The instruction, MOV AX, [BX] is an example of \_\_\_\_\_.  
a) direct addressing mode  
b) register addressing mode  
c) register relative addressing mode  
d) register indirect addressing mode
- 14)** The instruction, "INC" increases the contents of the specified register or memory location by
- |      |      |
|------|------|
| a) 2 | b) 0 |
| c) 1 | d) 3 |

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Three) 12**

- a) Explain flag Registers of 8085.
- b) What are different types of Addressing Modes explain with example.
- c) Explain Directives in 8086.
- d) Explain PUSH, POP, OUT, HLT instruction.

**Q.3 Draw and explain architecture of 8086. 08**

**Q.4 Draw and explain minimum mode of 8086. 08**

**OR**

Write a assembly language program to perform addition subtraction of two 16 bit data.

**Section – II**

**Q.5 Answer the following question. (Any Three) 12**

- a) Differentiate between maskable and nonmaskable interrupt.
- b) Explain following.
  - 1) ISR
  - 2) IRR
  - 3) IMR
  - 4) Priority Resolver
- c) Write down features of 8255.
- d) What are different numeric data types.

**Q.6 Draw and explain block diagram of 8257 DMA controller. 08**

**Q.7 Explain following operating mode of 8257. 08**

- a) Rotating operating mode
- b) Fixed operating mode
- c) Auto load operating mode
- d) Extended write mode

**OR**

Draw and explain block diagram of 80286.

|          |  |
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Set **P**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Graphics**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ is the features of Computer Graphics.
  - a) Creation and deletion of images by computer only
  - b) Deletion and manipulation of graphical images by computer
  - c) Creation and manipulation of graphics by computer
  - d) Creation of artificial images by computer only
- 2) The maximum number of points that can be displayed without overlap on a CRT is referred to as \_\_\_\_\_.
  - a) Resolution
  - b) Persistence
  - c) Attenuation
  - d) None of the above
- 3) The process of determining the suitable or appropriate pixels for representing image or graphic object is called \_\_\_\_\_.
  - a) Animation
  - b) Rasterization
  - c) Scan-Conversion
  - d) Quantization
- 4) Run length coding is used for \_\_\_\_\_.
  - a) Image smoothening
  - b) Image compression
  - c) Image coloring
  - d) Image dithering
- 5) The basic geometric transformations are \_\_\_\_\_.
  - a) Translation
  - b) Rotation
  - c) Scaling
  - d) All of the mentioned
- 6) Which of the following operation can be applied on a 3 D object to zoom it in or out about any axis from its original position?
  - a) Translation
  - b) Scaling
  - c) Rotation
  - d) Shearing
- 7) Clipping algorithm which follows "Divide and conquer" strategy is \_\_\_\_\_.
  - a) Sutherland - Cohen algorithm
  - b) Cyrus - Beck algorithm
  - c) Midpoint subdivision
  - d) None of the above
- 8) The centre region of the screen and the window can be represented as \_\_\_\_\_.
  - a) 0000
  - b) 1111
  - c) 0110
  - d) 1001

- 9) In the Cohen-Sutherland line clipping algorithm, if the codes of the two points P and Q are 0101 and 0001 then the line segment joining the points P and Q will be \_\_\_\_\_ the clipping window.
- |                    |                      |
|--------------------|----------------------|
| a) Totally outside | b) Partially outside |
| c) Totally inside  | d) None              |
- 10) Aliasing effect means \_\_\_\_\_.  
a) Staircase effect                      b) Shading effect  
c) Rendering effect                      d) Cueing effect
- 11) In Warnock algorithm, the polygon is called as surrounding, if it completely \_\_\_\_\_ the window.  
a) Outside                                  b) Contains  
c) Intersects                              d) None of above
- 12) The technique of using a minimum number of intensity levels to obtain increased visual resolution is called as \_\_\_\_\_.  
a) Dithering                                b) Halftoning  
c) Depth cueing                            d) Rendering
- 13) \_\_\_\_\_ control points are the points which decides the local shape of a curve.  
a) Local                                      b) Global  
c) Interpolation                            d) None
- 14) A curve that passes through all the known data points is known as curve is \_\_\_\_\_.  
a) fair to data                              b) fit to data  
c) both fair and fit to data              d) None of the above

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Graphics**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following question. (Any Four) 16**
- Distinguish between the Raster Scan display and Random Scan display.
  - Explain 2D Rotation.
  - Explain any four Computer graphics applications.
  - Scale the polygon with coordinates P(2,5), Q(7,10), C(10,2) by 2 units in both x and y direction.
  - Explain Run Length Encoding.
- Q.3 Answer the following question. (Any One) 06**
- Consider a line from (0,0) to (5,6). Use DDA algorithm to rasterize this line.
  - Write a Bresenham's Circle generation algorithm.
- Q.4 Attempt the following. 06**
- Beam Penetration Technique
  - Shadow Mask Technique

**Section – II**

- Q.5 Answer the following question. (Any Four) 16**
- Write a short note on segmented display file.
  - Explain Viewing transformation in detail.
  - Explain properties of Bezier curve.
  - Explain Z-Buffer algorithm.
  - Explain Painter's algorithm.
- Q.6 Answer the following question. (Any One) 06**
- Explain Warnock algorithm.
  - What is antialiasing? Explain different techniques of antialiasing.
- Q.7 Explain Cohen-Sutherland Line Clipping algorithm. 06**

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- 8) \_\_\_\_\_ is the features of Computer Graphics.
- a) Creation and deletion of images by computer only
  - b) Deletion and manipulation of graphical images by computer
  - c) Creation and manipulation of graphics by computer
  - d) Creation of artificial images by computer only
- 9) The maximum number of points that can be displayed without overlap on a CRT is referred to as \_\_\_\_\_.
- a) Resolution
  - b) Persistence
  - c) Attenuation
  - d) None of the above
- 10) The process of determining the suitable or appropriate pixels for representing image or graphic object is called \_\_\_\_\_.
- a) Animation
  - b) Rasterization
  - c) Scan-Conversion
  - d) Quantization
- 11) Run length coding is used for \_\_\_\_\_.
- a) Image smoothening
  - b) Image compression
  - c) Image coloring
  - d) Image dithering
- 12) The basic geometric transformations are \_\_\_\_\_.
- a) Translation
  - b) Rotation
  - c) Scaling
  - d) All of the mentioned
- 13) Which of the following operation can be applied on a 3 D object to zoom it in or out about any axis from its original position?
- a) Translation
  - b) Scaling
  - c) Rotation
  - d) Shearing
- 14) Clipping algorithm which follows "Divide and conquer" strategy is \_\_\_\_\_.
- a) Sutherland - Cohen algorithm
  - b) Cyrus - Beck algorithm
  - c) Midpoint subdivision
  - d) None of the above



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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Graphics**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following question. (Any Four) 16**
- Distinguish between the Raster Scan display and Random Scan display.
  - Explain 2D Rotation.
  - Explain any four Computer graphics applications.
  - Scale the polygon with coordinates P(2,5), Q(7,10), C(10,2) by 2 units in both x and y direction.
  - Explain Run Length Encoding.
- Q.3 Answer the following question. (Any One) 06**
- Consider a line from (0,0) to (5,6). Use DDA algorithm to rasterize this line.
  - Write a Bresenham's Circle generation algorithm.
- Q.4 Attempt the following. 06**
- Beam Penetration Technique
  - Shadow Mask Technique

**Section – II**

- Q.5 Answer the following question. (Any Four) 16**
- Write a short note on segmented display file.
  - Explain Viewing transformation in detail.
  - Explain properties of Bezier curve.
  - Explain Z-Buffer algorithm.
  - Explain Painter's algorithm.
- Q.6 Answer the following question. (Any One) 06**
- Explain Warnock algorithm.
  - What is antialiasing? Explain different techniques of antialiasing.
- Q.7 Explain Cohen-Sutherland Line Clipping algorithm. 06**

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Graphics**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In Warnock algorithm, the polygon is called as surrounding, if it completely \_\_\_\_\_ the window.
 

|               |                  |
|---------------|------------------|
| a) Outside    | b) Contains      |
| c) Intersects | d) None of above |
- 2) The technique of using a minimum number of intensity levels to obtain increased visual resolution is called as \_\_\_\_\_.
 

|                 |               |
|-----------------|---------------|
| a) Dithering    | b) Halftoning |
| c) Depth cueing | d) Rendering  |
- 3) \_\_\_\_\_ control points are the points which decides the local shape of a curve.
 

|                  |           |
|------------------|-----------|
| a) Local         | b) Global |
| c) Interpolation | d) None   |
- 4) A curve that passes through all the known data points is known as curve is \_\_\_\_\_.
 

|                              |                      |
|------------------------------|----------------------|
| a) fair to data              | b) fit to data       |
| c) both fair and fit to data | d) None of the above |
- 5) \_\_\_\_\_ is the features of Computer Graphics.
 

|                                                              |
|--------------------------------------------------------------|
| a) Creation and deletion of images by computer only          |
| b) Deletion and manipulation of graphical images by computer |
| c) Creation and manipulation of graphics by computer         |
| d) Creation of artificial images by computer only            |
- 6) The maximum number of points that can be displayed without overlap on a CRT is referred to as \_\_\_\_\_.
 

|                |                      |
|----------------|----------------------|
| a) Resolution  | b) Persistence       |
| c) Attenuation | d) None of the above |
- 7) The process of determining the suitable or appropriate pixels for representing image or graphic object is called \_\_\_\_\_.
 

|                    |                  |
|--------------------|------------------|
| a) Animation       | b) Rasterization |
| c) Scan-Conversion | d) Quantization  |

- 8) Run length coding is used for \_\_\_\_\_.  
a) Image smoothening                      b) Image compression  
c) Image coloring                          d) Image dithering
- 9) The basic geometric transformations are \_\_\_\_\_.  
a) Translation                              b) Rotation  
c) Scaling                                  d) All of the mentioned
- 10) Which of the following operation can be applied on a 3 D object to zoom it in or out about any axis from its original position?  
a) Translation                              b) Scaling  
c) Rotation                                  d) Shearing
- 11) Clipping algorithm which follows "Divide and conquer" strategy is \_\_\_\_\_.  
a) Sutherland - Cohen algorithm      b) Cyrus - Beck algorithm  
c) Midpoint subdivision                  d) None of the above
- 12) The centre region of the screen and the window can be represented as \_\_\_\_\_.  
a) 0000                                      b) 1111  
c) 0110                                      d) 1001
- 13) In the Cohen-Sutherland line clipping algorithm, if the codes of the two points P and Q are 0101 and 0001 then the line segment joining the points P and Q will be \_\_\_\_\_ the clipping window.  
a) Totally outside                          b) Partially outside  
c) Totally inside                            d) None
- 14) Aliasing effect means \_\_\_\_\_.  
a) Staircase effect                          b) Shading effect  
c) Rendering effect                        d) Cueing effect

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Graphics**

Day &amp; Date: Monday, 20-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following question. (Any Four) 16**
- Distinguish between the Raster Scan display and Random Scan display.
  - Explain 2D Rotation.
  - Explain any four Computer graphics applications.
  - Scale the polygon with coordinates P(2,5), Q(7,10), C(10,2) by 2 units in both x and y direction.
  - Explain Run Length Encoding.
- Q.3 Answer the following question. (Any One) 06**
- Consider a line from (0,0) to (5,6). Use DDA algorithm to rasterize this line.
  - Write a Bresenham's Circle generation algorithm.
- Q.4 Attempt the following. 06**
- Beam Penetration Technique
  - Shadow Mask Technique

**Section – II**

- Q.5 Answer the following question. (Any Four) 16**
- Write a short note on segmented display file.
  - Explain Viewing transformation in detail.
  - Explain properties of Bezier curve.
  - Explain Z-Buffer algorithm.
  - Explain Painter's algorithm.
- Q.6 Answer the following question. (Any One) 06**
- Explain Warnock algorithm.
  - What is antialiasing? Explain different techniques of antialiasing.
- Q.7 Explain Cohen-Sutherland Line Clipping algorithm. 06**

**Seat  
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| Set | S |
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Day & Date: Monday, 20-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

## 14

- Page 10 of 12

- 9) A curve that passes through all the known data points is known as curve is \_\_\_\_\_.
  - a) fair to data
  - b) fit to data
  - c) both fair and fit to data
  - d) None of the above
- 10) \_\_\_\_\_ is the features of Computer Graphics.
  - a) Creation and deletion of images by computer only
  - b) Deletion and manipulation of graphical images by computer
  - c) Creation and manipulation of graphics by computer
  - d) Creation of artificial images by computer only
- 11) The maximum number of points that can be displayed without overlap on a CRT is referred to as \_\_\_\_\_.
  - a) Resolution
  - b) Persistence
  - c) Attenuation
  - d) None of the above
- 12) The process of determining the suitable or appropriate pixels for representing image or graphic object is called \_\_\_\_\_.
  - a) Animation
  - b) Rasterization
  - c) Scan-Conversion
  - d) Quantization
- 13) Run length coding is used for \_\_\_\_\_.
  - a) Image smoothening
  - b) Image compression
  - c) Image coloring
  - d) Image dithering
- 14) The basic geometric transformations are \_\_\_\_\_.
  - a) Translation
  - b) Rotation
  - c) Scaling
  - d) All of the mentioned

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Graphics**

Day & Date: Monday, 20-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following question. (Any Four) 16**
- a) Distinguish between the Raster Scan display and Random Scan display.
  - b) Explain 2D Rotation.
  - c) Explain any four Computer graphics applications.
  - d) Scale the polygon with coordinates P(2,5), Q(7,10), C(10,2) by 2 units in both x and y direction.
  - e) Explain Run Length Encoding.
- Q.3 Answer the following question. (Any One) 06**
- a) Consider a line from (0,0) to (5,6). Use DDA algorithm to rasterize this line.
  - b) Write a Bresenham's Circle generation algorithm.
- Q.4 Attempt the following. 06**
- a) Beam Penetration Technique
  - b) Shadow Mask Technique

**Section – II**

- Q.5 Answer the following question. (Any Four) 16**
- a) Write a short note on segmented display file.
  - b) Explain Viewing transformation in detail.
  - c) Explain properties of Bezier curve.
  - d) Explain Z-Buffer algorithm.
  - e) Explain Painter's algorithm.
- Q.6 Answer the following question. (Any One) 06**
- a) Explain Warnock algorithm.
  - b) What is antialiasing? Explain different techniques of antialiasing.
- Q.7 Explain Cohen-Sutherland Line Clipping algorithm. 06**

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 1 of 16



- 7) Which of the following is not a Dirichlet's condition?  
 a)  $f(x)$  is periodic  
 b)  $f(x)$  is single valued  
 c)  $f(x)$  is even function  
 d)  $f(x)$  is infinite
- 8) If  $(x) = x^2$  is expanded as a cosine series in  $(0, \pi)$  then the constant term is \_\_\_\_\_.  
 a)  $\frac{\pi^2}{3}$   
 b)  $\frac{\pi^3}{3}$   
 c)  $\frac{2\pi^2}{3}$   
 d)  $\frac{3\pi^2}{2}$
- 9) Correlation analysis help us to \_\_\_\_\_ our activities.  
 a) Control  
 b) Plan  
 c) Predict  
 d) All of above
- 10) A discrete probability distribution function of a discrete random variable is given by,
- |         |     |      |      |      |      |                   |
|---------|-----|------|------|------|------|-------------------|
| $x:$    | 0   | 1    | 2    | 3    | 4    |                   |
| $P(x):$ | $k$ | $3k$ | $5k$ | $4k$ | $2k$ | then $k =$ _____. |
- a)  $1/3$   
 b)  $1/15$   
 c)  $1/5$   
 d)  $1$
- 11) Between 2 and 4 pm average number of phone calls coming to a switch board of a company is 2.5. Then the probability that during a minute there will be exactly 3 calls is \_\_\_\_\_.  
 a) 0.2138  
 b) 0.3120  
 c) 0.2183  
 d) 0.3821S
- 12) If  $b_{yx} = 5/18, b_{xy} = 8/5$ , then  $r =$  \_\_\_\_\_.  
 a)  $2/5$   
 b)  $2/3$   
 c)  $1/2$   
 d)  $3/2$
- 13) Idle time of queuing system is \_\_\_\_\_.  
 a)  $1 - \frac{\lambda}{\mu}$   
 b)  $\frac{\lambda}{\mu}$   
 c)  $\frac{\mu}{\lambda}$   
 d)  $1 - \frac{\mu}{\lambda}$
- 14) In a  $M/M/1/\infty$  system the probability that there will be no customer in the system is \_\_\_\_\_.  
 a)  $\rho$   
 b)  $\rho^2$   
 c)  $1 - \rho$   
 d)  $1 - \rho^2$

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Set **P**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – I**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.** **09**

- Solve  $(D^4 + 8D^2 + 16)y = \sin^2 x$ .
- Solve  $(D^2 - 2D + 1)y = x^2 e^{3x}$ .
- Find  $L \{t \sqrt{1 - \sin t}\}$ .
- Find the inverse Laplace transform of  $\frac{s+29}{(s+4)(s^2+9)}$
- Find  $Z\{k^2 a^{k-1}\}, k \geq 0$ .

**Q.3 Attempt any three of the following.** **09**

- Solve  $(D^3 - D^2 - 6D)y = x^2 + 1$ .
- Find Inverse Z-transform of  $\frac{1}{(z-5)^3}, |Z| > 5$
- Evaluate  $\int_0^\infty e^{-t} \left( \frac{1 - \cos t}{t} \right) dt$
- Find  $Z \left\{ \left( \frac{1}{3} \right)^{|k|} \right\}$
- Find  $L^{-1} \left\{ \log \left( 1 + \frac{a^2}{s^2} \right) \right\}$

**Q.4 Attempt any two of the following.** **10**

- Solve  $(D^2 + a^2)y = \sec ax$ .
- Using Laplace transform method solve  $y''(t) - y'(t) - 2y(t) = 20\sin 2t$ , ,  
with  $y(0) = 1$  and  $y'(0) = 2$ .
- Calculate inverse Z- Transform of  $F(z) = \frac{z^2}{\left(z - \frac{1}{4}\right)\left(z - \frac{1}{5}\right)}$ , if ROC is,
  - $\frac{1}{5} < |Z| < \frac{1}{4}$ ,
  - $|Z| < \frac{1}{5}$

**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Obtain Fourier series expansion of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$  in  $(-\pi, \pi)$
- Obtain half range cosine series of  $f(x) = e^{-x}$  in  $0 < x < \pi$

- c) Assuming that half of the population in a city is vegetarian so that the chance of an individual being vegetarian is  $1/2$  and assuming that 100 investigators take a sample of 10 individuals to see whether they are vegetarian, how many investigators would you expect to report that three people or less were vegetarian.
- d) Calculate i)  $k$  ii)  $p(x > 5)$  iii)  $p(0 \leq x \leq 5)$ , if a random variable  $x$  has the following probability distribution

|        |     |      |      |       |           |        |        |
|--------|-----|------|------|-------|-----------|--------|--------|
| $x$    | 1   | 2    | 3    | 4     | 5         | 6      | 7      |
| $p(x)$ | $k$ | $2k$ | $3k$ | $k^2$ | $k^2 + k$ | $2k^2$ | $4k^2$ |

- e) With the usual notation find the average waiting time per customer in the queue and in the system for  $M/M/1/\infty$  model, if  $\lambda = 9$  and  $\mu = 15$  per hour.

**Q.6 Attempt any three of the following.****09**

- a) In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 and 2.5. Assuming the distribution to be normal find the number of students getting marks (i) between 12 and 15 (ii) above 18 (iii) below 8.  
(Given: For S.N.V.  $z$  area between  $z = 0$  and  $z = 0.4$  is 0.1554, that between  $z = 0$  and  $z = 0.8$  is 0.2881, that between  $z = 0$  and  $z = 1.6$  is 0.4452, that between  $z = 0$  and  $z = 2.4$  is 0.4918.)
- b) A supermarket has two girls serving at the two counters. The customers arrive in Poisson fashion at the rate of 12 per hour. The service time for each customer is exponential with mean 6 minutes. Find  
1) the probability that an arriving customer has to wait.  
2) the average number of customers in the system.
- c) Obtain the Fourier expansion of,  $f(x) = 2x - x^2$  in  $(0,3)$ .
- d) Calculate the correlation co-efficient between  $x$  and  $y$ , if Nine students obtained the following percentage of marks in the college examination ( $x$ ) and in the University examination ( $y$ ).

|     |    |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|
| $x$ | 51 | 53 | 73 | 46 | 50 | 60 | 47 | 36 | 60 |
| $y$ | 49 | 72 | 74 | 44 | 58 | 66 | 50 | 30 | 55 |

- e) The following mistakes per page were observed in a book.

|                 |     |    |    |   |   |       |
|-----------------|-----|----|----|---|---|-------|
| No. of mistakes | 0   | 1  | 2  | 3 | 4 | Total |
| No. of pages    | 211 | 90 | 19 | 5 | 0 | 325   |

Fit a Poisson distribution.

**Q.7 Attempt any two****10**

- a) At what rate a retail shop owner having no assistant, must work in order to ensure that 90% of the customers will not have to wait more than 12 minutes? It is assumed that the customers arrive in Poisson process at an average rate of 18 per hour and the length of the service by the owner has an exponential distribution?
- b) Obtain the Fourier series of,  $f(x) = \left(\frac{\pi-x}{2}\right)^2$  in  $(0,2\pi)$  and hence deduce that  $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots$
- c) Calculate the equations of two lines of regression and calculate expected height of son when the height of father is 154 cms. Heights of fathers and sons are given below

|                       |     |     |     |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Ht. of Father ( $x$ ) | 150 | 152 | 155 | 157 | 160 | 161 | 164 | 166 |
| Ht. of Son ( $y$ )    | 154 | 156 | 158 | 159 | 160 | 162 | 161 | 164 |

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 5 of 16

- 7) In a  $M/M/1/\infty$  system the probability that there will be no customer in the system is \_\_\_\_\_.  
 a)  $\rho$  b)  $\rho^2$   
 c)  $1 - \rho$  d)  $1 - \rho^2$
- 8) The complementary function of the equation  $[(D + 1)^2(D + 4)]y = 2t$  is \_\_\_\_\_.  
 a)  $c_1 e^{-t} + c_2 e^{-4t} + c_3 e^t$  b)  $c_1 \cos t + c_2 \sin t + c_3 e^{-4t}$   
 c)  $(c_1 + c_2 t)e^t + c_3 e^{-4t}$  d)  $(c_1 + c_2 t)e^{-t} + c_3 e^{-4t}$
- 9) The general solution of  $(D^4 + 2D^2 + 1)y = 0$  is \_\_\_\_\_.  
 a)  $c_1 \cos x + c_2 \sin x + c_3 \cos x + c_4 \sin x$   
 b)  $(c_1 + c_2 x)e^x$   
 c)  $(c_1 + c_2 x) \cos x + (c_3 + c_4 x) \sin x$   
 d)  $(c_1 + c_2 x + c_3 x^2 + c_4 x^3)e^{-x}$
- 10) The value of the integral  $\int_0^\infty e^{-2t} \cos 3t dt$  is \_\_\_\_\_.  
 a)  $1/13$  b)  $2/13$   
 c)  $13^2$  d)  $13$
- 11)  $L^{-1} \left\{ \frac{1}{s^2 - 3^2} \right\} =$  \_\_\_\_\_.  
 a)  $\frac{1}{3} \sin 3t$  b)  $\frac{1}{3} \cos 3t$   
 c)  $\frac{1}{3} \cos h3t$  d)  $\frac{1}{3} \sin h3t$
- 12) If  $Z\{f(k)\} = F(z)$ , then  $Z\{a^k f(k)\} =$  \_\_\_\_\_.  
 a)  $F\left(\frac{z}{a}\right)$  b)  $F\left(\frac{a}{z}\right)$   
 c)  $\frac{1}{a} F\left(\frac{z}{a}\right)$  d)  $\frac{1}{a} F\left(\frac{a}{z}\right)$
- 13)  $Z^{-1} \left\{ \frac{z}{z+a} \right\}, |z| > a$  (with  $k \geq 0$ ) is \_\_\_\_\_.  
 a)  $a^k$  b)  $(-a)^k$   
 c)  $a^{k+1}$  d)  $a^{-k-1}$
- 14) Which of the following is not a Dirichlet's condition?  
 a)  $f(x)$  is periodic b)  $f(x)$  is single valued  
 c)  $f(x)$  is even function d)  $f(x)$  is infinite

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| Seat No. |  |
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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – I**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following. 09**

- Solve  $(D^4 + 8D^2 + 16)y = \sin^2 x$ .
- Solve  $(D^2 - 2D + 1)y = x^2 e^{3x}$ .
- Find  $L \{t \cdot \sqrt{1 - \sin t}\}$ .
- Find the inverse Laplace transform of  $\frac{s+29}{(s+4)(s^2+9)}$
- Find  $Z\{k^2 a^{k-1}\}, k \geq 0$ .

**Q.3 Attempt any three of the following. 09**

- Solve  $(D^3 - D^2 - 6D)y = x^2 + 1$ .
- Find Inverse Z-transform of  $\frac{1}{(z-5)^3}, |Z| > 5$
- Evaluate  $\int_0^\infty e^{-t} \left(\frac{1-\cos t}{t}\right) dt$
- Find  $Z \left\{ \left(\frac{1}{3}\right)^{|k|} \right\}$
- Find  $L^{-1} \left\{ \log \left( 1 + \frac{a^2}{s^2} \right) \right\}$

**Q.4 Attempt any two of the following. 10**

- Solve  $(D^2 + a^2)y = \sec ax$ .
- Using Laplace transform method solve  $y''(t) - y'(t) - 2y(t) = 20\sin 2t$ , , with  $y(0) = 1$  and  $y'(0) = 2$ .
- Calculate inverse Z- Transform of  $F(z) = \frac{z^2}{\left(z-\frac{1}{4}\right)\left(z-\frac{1}{5}\right)}$ , if ROC is,
  - $\frac{1}{5} < |Z| < \frac{1}{4}$ ,
  - $|Z| < \frac{1}{5}$

**Section – II**

**Q.5 Attempt any three of the following. 09**

- Obtain Fourier series expansion of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$  in  $(-\pi, \pi)$
- Obtain half range cosine series of  $f(x) = e^{-x}$  in  $0 < x < \pi$

- c) Assuming that half of the population in a city is vegetarian so that the chance of an individual being vegetarian is  $1/2$  and assuming that 100 investigators take a sample of 10 individuals to see whether they are vegetarian, how many investigators would you expect to report that three people or less were vegetarian.
- d) Calculate i)  $k$  ii)  $p(x > 5)$  iii)  $p(0 \leq x \leq 5)$ , if a random variable  $x$  has the following probability distribution

|        |     |      |      |       |           |        |        |
|--------|-----|------|------|-------|-----------|--------|--------|
| $x$    | 1   | 2    | 3    | 4     | 5         | 6      | 7      |
| $p(x)$ | $k$ | $2k$ | $3k$ | $k^2$ | $k^2 + k$ | $2k^2$ | $4k^2$ |

- e) With the usual notation find the average waiting time per customer in the queue and in the system for  $M/M/1/\infty$  model, if  $\lambda = 9$  and  $\mu = 15$  per hour.

**Q.6 Attempt any three of the following.****09**

- a) In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 and 2.5. Assuming the distribution to be normal find the number of students getting marks (i) between 12 and 15 (ii) above 18 (iii) below 8.  
(Given: For S.N.V.  $z$  area between  $z = 0$  and  $z = 0.4$  is 0.1554, that between  $z = 0$  and  $z = 0.8$  is 0.2881, that between  $z = 0$  and  $z = 1.6$  is 0.4452, that between  $z = 0$  and  $z = 2.4$  is 0.4918.)
- b) A supermarket has two girls serving at the two counters. The customers arrive in Poisson fashion at the rate of 12 per hour. The service time for each customer is exponential with mean 6 minutes. Find  
1) the probability that an arriving customer has to wait.  
2) the average number of customers in the system.
- c) Obtain the Fourier expansion of,  $f(x) = 2x - x^2$  in  $(0,3)$ .
- d) Calculate the correlation co-efficient between  $x$  and  $y$ , if Nine students obtained the following percentage of marks in the college examination ( $x$ ) and in the University examination ( $y$ ).

|     |    |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|
| $x$ | 51 | 53 | 73 | 46 | 50 | 60 | 47 | 36 | 60 |
| $y$ | 49 | 72 | 74 | 44 | 58 | 66 | 50 | 30 | 55 |

- e) The following mistakes per page were observed in a book.

|                 |     |    |    |   |   |       |
|-----------------|-----|----|----|---|---|-------|
| No. of mistakes | 0   | 1  | 2  | 3 | 4 | Total |
| No. of pages    | 211 | 90 | 19 | 5 | 0 | 325   |

Fit a Poisson distribution.

**Q.7 Attempt any two****10**

- a) At what rate a retail shop owner having no assistant, must work in order to ensure that 90% of the customers will not have to wait more than 12 minutes? It is assumed that the customers arrive in Poisson process at an average rate of 18 per hour and the length of the service by the owner has an exponential distribution?
- b) Obtain the Fourier series of,  $f(x) = \left(\frac{\pi-x}{2}\right)^2$  in  $(0,2\pi)$  and hence deduce that  $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots$
- c) Calculate the equations of two lines of regression and calculate expected height of son when the height of father is 154 cms. Heights of fathers and sons are given below

|                       |     |     |     |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Ht. of Father ( $x$ ) | 150 | 152 | 155 | 157 | 160 | 161 | 164 | 166 |
| Ht. of Son ( $y$ )    | 154 | 156 | 158 | 159 | 160 | 162 | 161 | 164 |

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 9 of 16



- 7) The value of the integral  $\int_0^{\infty} e^{-2t} \cos 3t dt$  is \_\_\_\_\_.  
 a)  $1/13$  b)  $2/13$   
 c)  $13^2$  d)  $13$
- 8)  $L^{-1} \left\{ \frac{1}{s^2 - 3^2} \right\} =$  \_\_\_\_\_.  
 a)  $\frac{1}{3} \sin 3t$  b)  $\frac{1}{3} \cos 3t$   
 c)  $\frac{1}{3} \cos h3t$  d)  $\frac{1}{3} \sin h3t$
- 9) If  $Z\{f(k)\} = F(z)$ , then  $Z\{a^k f(k)\} =$  \_\_\_\_\_.  
 a)  $F\left(\frac{z}{a}\right)$  b)  $F\left(\frac{a}{z}\right)$   
 c)  $\frac{1}{a} F\left(\frac{z}{a}\right)$  d)  $\frac{1}{a} F\left(\frac{a}{z}\right)$
- 10)  $Z^{-1} \left\{ \frac{z}{z+a} \right\}, |z| > a$  (with  $k \geq 0$ ) is \_\_\_\_\_.  
 a)  $a^k$  b)  $(-a)^k$   
 c)  $a^{k+1}$  d)  $a^{-k-1}$
- 11) Which of the following is not a Dirichlet's condition?  
 a)  $f(x)$  is periodic b)  $f(x)$  is single valued  
 c)  $f(x)$  is even function d)  $f(x)$  is infinite
- 12) If  $(x) = x^2$  is expanded as a cosine series in  $(0, \pi)$  then the constant term is \_\_\_\_\_.  
 a)  $\frac{\pi^2}{3}$  b)  $\frac{\pi^3}{3}$   
 c)  $\frac{2\pi^2}{3}$  d)  $\frac{3\pi^2}{2}$
- 13) Correlation analysis help us to \_\_\_\_\_ our activities.  
 a) Control b) Plan  
 c) Predict d) All of above
- 14) A discrete probability distribution function of a discrete random variable is given by,
- |         |     |      |      |      |      |                   |
|---------|-----|------|------|------|------|-------------------|
| $x:$    | 0   | 1    | 2    | 3    | 4    |                   |
| $P(x):$ | $k$ | $3k$ | $5k$ | $4k$ | $2k$ | then $k =$ _____. |
- a)  $1/3$  b)  $1/15$   
 c)  $1/5$  d)  $1$

|          |  |
|----------|--|
| Seat No. |  |
|----------|--|

Set **R**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – I**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.** **09**

- Solve  $(D^4 + 8D^2 + 16)y = \sin^2 x$ .
- Solve  $(D^2 - 2D + 1)y = x^2 e^{3x}$ .
- Find  $L \{t \sqrt{1 - \sin t}\}$ .
- Find the inverse Laplace transform of  $\frac{s+29}{(s+4)(s^2+9)}$
- Find  $Z\{k^2 a^{k-1}\}, k \geq 0$ .

**Q.3 Attempt any three of the following.** **09**

- Solve  $(D^3 - D^2 - 6D)y = x^2 + 1$ .
- Find Inverse Z-transform of  $\frac{1}{(z-5)^3}, |z| > 5$
- Evaluate  $\int_0^\infty e^{-t} \left( \frac{1 - \cos t}{t} \right) dt$
- Find  $Z \left\{ \left( \frac{1}{3} \right)^{|k|} \right\}$
- Find  $L^{-1} \left\{ \log \left( 1 + \frac{a^2}{s^2} \right) \right\}$

**Q.4 Attempt any two of the following.** **10**

- Solve  $(D^2 + a^2)y = \sec ax$ .
- Using Laplace transform method solve  $y''(t) - y'(t) - 2y(t) = 20\sin 2t$ , ,  
with  $y(0) = 1$  and  $y'(0) = 2$ .
- Calculate inverse Z- Transform of  $F(z) = \frac{z^2}{\left(z - \frac{1}{4}\right)\left(z - \frac{1}{5}\right)}$ , if ROC is,
  - $\frac{1}{5} < |z| < \frac{1}{4}$ ,
  - $|z| < \frac{1}{5}$

**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Obtain Fourier series expansion of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$  in  $(-\pi, \pi)$
- Obtain half range cosine series of  $f(x) = e^{-x}$  in  $0 < x < \pi$

- c) Assuming that half of the population in a city is vegetarian so that the chance of an individual being vegetarian is  $1/2$  and assuming that 100 investigators take a sample of 10 individuals to see whether they are vegetarian, how many investigators would you expect to report that three people or less were vegetarian.
- d) Calculate i)  $k$  ii)  $p(x > 5)$  iii)  $p(0 \leq x \leq 5)$ , if a random variable  $x$  has the following probability distribution
- |        |     |      |      |       |           |        |        |
|--------|-----|------|------|-------|-----------|--------|--------|
| $x$    | 1   | 2    | 3    | 4     | 5         | 6      | 7      |
| $p(x)$ | $k$ | $2k$ | $3k$ | $k^2$ | $k^2 + k$ | $2k^2$ | $4k^2$ |
- e) With the usual notation find the average waiting time per customer in the queue and in the system for  $M/M/1/\infty$  model, if  $\lambda = 9$  and  $\mu = 15$  per hour.

**Q.6 Attempt any three of the following.****09**

- a) In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 and 2.5. Assuming the distribution to be normal find the number of students getting marks (i) between 12 and 15 (ii) above 18 (iii) below 8.  
(Given: For S.N.V.  $z$  area between  $z = 0$  and  $z = 0.4$  is 0.1554, that between  $z = 0$  and  $z = 0.8$  is 0.2881, that between  $z = 0$  and  $z = 1.6$  is 0.4452, that between  $z = 0$  and  $z = 2.4$  is 0.4918.)
- b) A supermarket has two girls serving at the two counters. The customers arrive in Poisson fashion at the rate of 12 per hour. The service time for each customer is exponential with mean 6 minutes. Find  
1) the probability that an arriving customer has to wait.  
2) the average number of customers in the system.
- c) Obtain the Fourier expansion of,  $f(x) = 2x - x^2$  in  $(0,3)$ .
- d) Calculate the correlation co-efficient between  $x$  and  $y$ , if Nine students obtained the following percentage of marks in the college examination ( $x$ ) and in the University examination ( $y$ ).

|     |    |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|
| $x$ | 51 | 53 | 73 | 46 | 50 | 60 | 47 | 36 | 60 |
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| No. of mistakes | 0   | 1  | 2  | 3 | 4 | Total |
| No. of pages    | 211 | 90 | 19 | 5 | 0 | 325   |

Fit a Poisson distribution.

**Q.7 Attempt any two****10**

- a) At what rate a retail shop owner having no assistant, must work in order to ensure that 90% of the customers will not have to wait more than 12 minutes? It is assumed that the customers arrive in Poisson process at an average rate of 18 per hour and the length of the service by the owner has an exponential distribution?
- b) Obtain the Fourier series of,  $f(x) = \left(\frac{\pi-x}{2}\right)^2$  in  $(0,2\pi)$  and hence deduce that  $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots$
- c) Calculate the equations of two lines of regression and calculate expected height of son when the height of father is 154 cms. Heights of fathers and sons are given below

|                       |     |     |     |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Ht. of Father ( $x$ ) | 150 | 152 | 155 | 157 | 160 | 161 | 164 | 166 |
| Ht. of Son ( $y$ )    | 154 | 156 | 158 | 159 | 160 | 162 | 161 | 164 |

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 13 of 16

- 8) Idle time of queuing system is \_\_\_\_\_.  
 a)  $1 - \frac{\lambda}{\mu}$  b)  $\frac{\lambda}{\mu}$   
 c)  $\frac{\mu}{\lambda}$  d)  $1 - \frac{\mu}{\lambda}$
- 9) In a  $M/M/1/\infty$  system the probability that there will be no customer in the system is \_\_\_\_\_.  
 a)  $\rho$  b)  $\rho^2$   
 c)  $1 - \rho$  d)  $1 - \rho^2$
- 10) The complementary function of the equation  $[(D + 1)^2(D + 4)]y = 2t$  is \_\_\_\_\_.  
 a)  $c_1 e^{-t} + c_2 e^{-4t} + c_3 e^t$  b)  $c_1 \cos t + c_2 \sin t + c_3 e^{-4t}$   
 c)  $(c_1 + c_2 t)e^t + c_3 e^{-4t}$  d)  $(c_1 + c_2 t)e^{-t} + c_3 e^{-4t}$
- 11) The general solution of  $(D^4 + 2D^2 + 1)y = 0$  is \_\_\_\_\_.  
 a)  $c_1 \cos x + c_2 \sin x + c_3 \cos x + c_4 \sin x$   
 b)  $(c_1 + c_2 x)e^x$   
 c)  $(c_1 + c_2 x) \cos x + (c_3 + c_4 x) \sin x$   
 d)  $(c_1 + c_2 x + c_3 x^2 + c_4 x^3)e^{-x}$
- 12) The value of the integral  $\int_0^\infty e^{-2t} \cos 3t dt$  is \_\_\_\_\_.  
 a)  $1/13$  b)  $2/13$   
 c)  $13^2$  d)  $13$
- 13)  $L^{-1} \left\{ \frac{1}{s^2 - 3^2} \right\} =$  \_\_\_\_\_.  
 a)  $\frac{1}{3} \sin 3t$  b)  $\frac{1}{3} \cos 3t$   
 c)  $\frac{1}{3} \cos h3t$  d)  $\frac{1}{3} \sin h3t$
- 14) If  $Z\{f(k)\} = F(z)$ , then  $Z\{a^k f(k)\} =$  \_\_\_\_\_.  
 a)  $F\left(\frac{z}{a}\right)$  b)  $F\left(\frac{a}{z}\right)$   
 c)  $\frac{1}{a} F\left(\frac{z}{a}\right)$  d)  $\frac{1}{a} F\left(\frac{a}{z}\right)$

|          |  |
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Set **S**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – I**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.** **09**

- Solve  $(D^4 + 8D^2 + 16)y = \sin^2 x$ .
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- Find  $L \{t \sqrt{1 - \sin t}\}$ .
- Find the inverse Laplace transform of  $\frac{s+29}{(s+4)(s^2+9)}$
- Find  $Z\{k^2 a^{k-1}\}, k \geq 0$ .

**Q.3 Attempt any three of the following.** **09**

- Solve  $(D^3 - D^2 - 6D)y = x^2 + 1$ .
- Find Inverse Z-transform of  $\frac{1}{(z-5)^3}, |Z| > 5$
- Evaluate  $\int_0^\infty e^{-t} \left( \frac{1 - \cos t}{t} \right) dt$
- Find  $Z \left\{ \left( \frac{1}{3} \right)^{|k|} \right\}$
- Find  $L^{-1} \left\{ \log \left( 1 + \frac{a^2}{s^2} \right) \right\}$

**Q.4 Attempt any two of the following.** **10**

- Solve  $(D^2 + a^2)y = \sec ax$ .
- Using Laplace transform method solve  $y''(t) - y'(t) - 2y(t) = 20\sin 2t$ , ,  
with  $y(0) = 1$  and  $y'(0) = 2$ .
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**Section – II**

**Q.5 Attempt any three of the following.** **09**

- Obtain Fourier series expansion of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$  in  $(-\pi, \pi)$
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- e) With the usual notation find the average waiting time per customer in the queue and in the system for  $M/M/1/\infty$  model, if  $\lambda = 9$  and  $\mu = 15$  per hour.

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- a) In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 and 2.5. Assuming the distribution to be normal find the number of students getting marks (i) between 12 and 15 (ii) above 18 (iii) below 8.  
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- e) The following mistakes per page were observed in a book.

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|-----------------|-----|----|----|---|---|-------|
| No. of mistakes | 0   | 1  | 2  | 3 | 4 | Total |
| No. of pages    | 211 | 90 | 19 | 5 | 0 | 325   |

Fit a Poisson distribution.

**Q.7 Attempt any two****10**

- a) At what rate a retail shop owner having no assistant, must work in order to ensure that 90% of the customers will not have to wait more than 12 minutes? It is assumed that the customers arrive in Poisson process at an average rate of 18 per hour and the length of the service by the owner has an exponential distribution?
- b) Obtain the Fourier series of,  $f(x) = \left(\frac{\pi-x}{2}\right)^2$  in  $(0,2\pi)$  and hence deduce that  $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots$
- c) Calculate the equations of two lines of regression and calculate expected height of son when the height of father is 154 cms. Heights of fathers and sons are given below

|                       |     |     |     |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Ht. of Father ( $x$ ) | 150 | 152 | 155 | 157 | 160 | 161 | 164 | 166 |
| Ht. of Son ( $y$ )    | 154 | 156 | 158 | 159 | 160 | 162 | 161 | 164 |

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 1 of 16



- 9) The push down automata indicate the acceptance of input string in terms of \_\_\_\_\_.  
a) Final state  
b) Empty stack  
c) Both (a) and (b)  
d) None of these
- 10) Which type of symbols contain in the stack of PDA?  
a) Variable  
b) Terminal  
c) Both (a) and (b)  
d) None of these
- 11) Inability of FA is \_\_\_\_\_.  
a) Writing  
b) Finite memory  
c) Sequential memory  
d) all a, b, and c
- 12) The symbol  $Z_0$  in formal definition of PDA is used for \_\_\_\_\_.  
a) Stack symbol  
b) Input symbol  
c) Both (a) and (b)  
d) None of these
- 13) A grammar  $G = (V, T, P, S)$  is \_\_\_\_\_ if every production taken one of the two forms:  
 $B \rightarrow aC$   
 $B \rightarrow a$   
a) Ambiguous  
b) Regular  
c) Non Regular  
d) None of the mentioned
- 14) Which of the following strings is not generated by the following grammar?  
 $S \rightarrow SaSbS|e$   
a) aabb  
b) abab  
c) aababb  
d) aaabb

|          |  |
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| Seat No. |  |
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Set **P**

**S.Y. (B.Tech) (Sem – II) (New) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

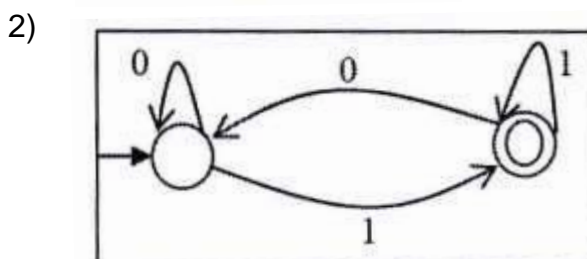
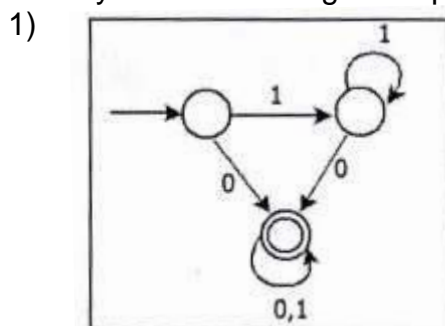
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any three**

**12**

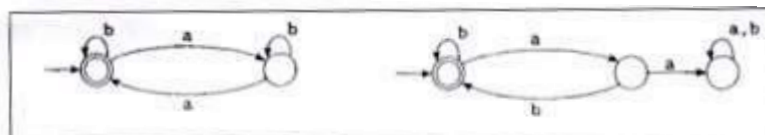
a) Identify the set of strings accepted by given following DFA.



b) Construct regular expression corresponding to each of the following subset of  $\{0, 1\}^*$

- The language of all strings containing exactly two 0's
- The language C identifiers.

c) Associate given M1 and M2 be the FAs are pictured for L1, L2 resp. to represent a machine accepting following language  $L1 \cup L2$ ,  $L1 - L2$



d) Write a context free grammar equivalent for  $(011+1)^*(01)^*$

**Q.3 Solve any One**

**08**

a) Convert the following grammar into Chomsky normal form

$S \rightarrow AACD$

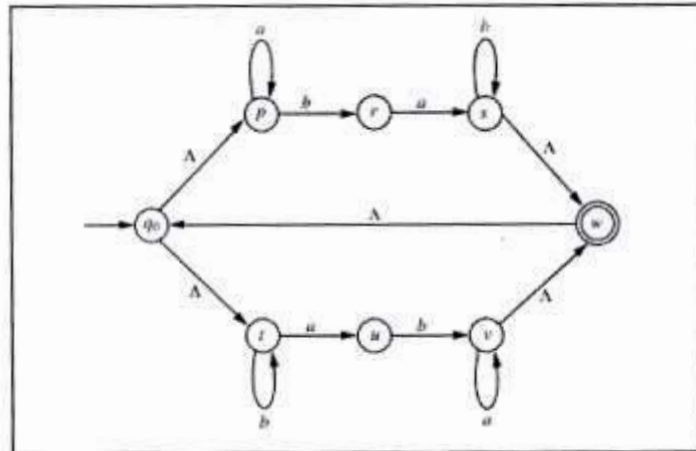
$A \rightarrow aAb|^{\wedge}$

$C \rightarrow aC|a$

$D \rightarrow aDa|bDb|^{\wedge}$

b) Check whether following string is accepted by given NFA-<sup>^</sup>

- 1) aa
- 2) bab
- 3) ab
- 4) abab



Q.4 Draw NFA-<sup>^</sup> for the following Regular expression

$$a^*b^*+(ba)^*$$

08

### Section – II

Q.5 Solve any three

12

- a) State and explain pumping lemma for CFL.
- b) What is PDA? Explain with an example.
- c) Obtain a TM to accept the language  
 $L = \{w | w \leftarrow (0 + 1)^* \text{ containing substring } 001\}$
- d) Show that  $L = \{a^n b^n | n \geq 1\}$  is not regular.

Q.6 Solve any One

08

- a) Obtain a PDA to accept the language  
 $L(M) = \{w | w \leftarrow (a + b)^* \text{ and } n_a(w) = n_b(w)\}$  by final state
- b) Explain Different types of variation in TM.

Q.7 State and explain the block diagram of TM and construct a TM to accept the language.

08

$$L(M) = \{a^n b^n c^n | n \geq 1\}$$

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 5 of 16

- 9) The language  $L = \{ a^n b^n a^n : n \geq 1 \}$  is recognized by \_\_\_\_\_.
  - a) TM
  - b) 2PDA
  - c) Post Machine
  - d) All of the above
- 10) The set of all strings over the alphabet  $S = \{a, b\}$  (including  $\epsilon$ ) is denoted by \_\_\_\_\_.
  - a)  $(a + b)^*$
  - b)  $(a + b) +$
  - c)  $a + b +$
  - d)  $a^* b^*$
- 11) UTM influenced the concept of \_\_\_\_\_.
  - a) Computability
  - b) Interpretive implementation of programming language
  - c) Program and data is in same memory
  - d) All of above
- 12) The entity which generate Language is termed as:
  - a) Automata
  - b) Tokens
  - c) Grammar
  - d) Data
- 13) There are \_\_\_\_\_ tuples in finite state machine.
  - a) 4
  - b) 5
  - c) 6
  - d) unlimited
- 14) PDA can be represented with the help of \_\_\_\_\_.
  - a) Instantaneous description
  - b) Transition diagram
  - c) Transition table
  - d) All of these

|          |  |
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Set **Q**

**S.Y. (B.Tech) (Sem – II) (New) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

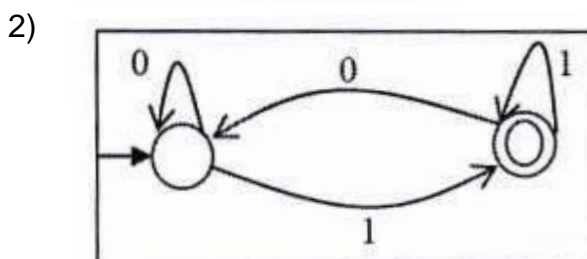
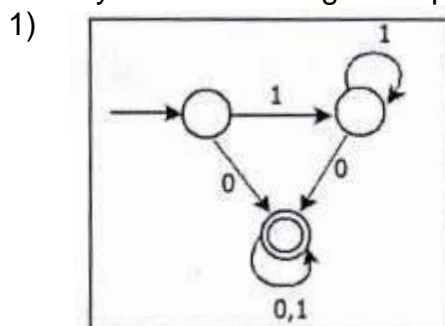
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any three**

**12**

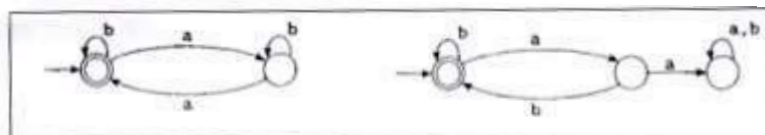
a) Identify the set of strings accepted by given following DFA.



b) Construct regular expression corresponding to each of the following subset of  $\{0, 1\}^*$

- The language of all strings containing exactly two 0's
- The language C identifiers.

c) Associate given M1 and M2 be the FAs are pictured for L1, L2 resp. to represent a machine accepting following language  $L1 \cup L2$ ,  $L1 - L2$



d) Write a context free grammar equivalent for  $(011+1)^*(01)^*$

**Q.3 Solve any One**

**08**

a) Convert the following grammar into Chomsky normal form

$S \rightarrow AACD$

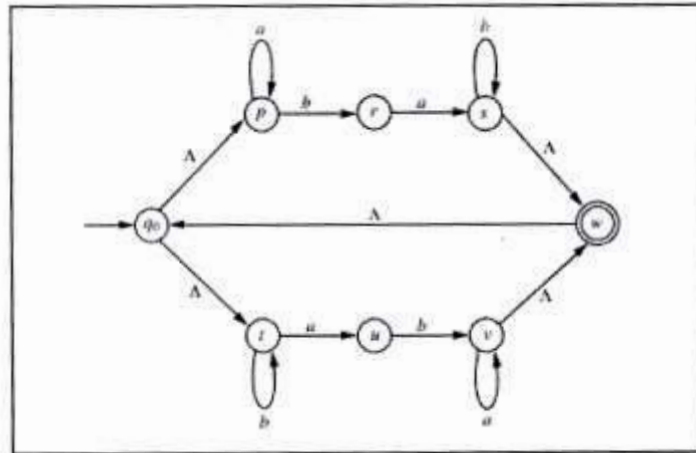
$A \rightarrow aAb|^{\wedge}$

$C \rightarrow aC|a$

$D \rightarrow aDa|bDb|^{\wedge}$

b) Check whether following string is accepted by given NFA- $\epsilon$

- 1) aa
- 2) bab
- 3) ab
- 4) abab



Q.4 Draw NFA- $\epsilon$  for the following Regular expression

$$a^*b^*(ba)^*$$

08

### Section – II

Q.5 Solve any three

12

- a) State and explain pumping lemma for CFL.
- b) What is PDA? Explain with an example.
- c) Obtain a TM to accept the language  
 $L = \{w | w \leftarrow (0 + 1)^* \text{ containing substring } 001\}$
- d) Show that  $L = \{a^n b^n | n \geq 1\}$  is not regular.

Q.6 Solve any One

08

- a) Obtain a PDA to accept the language  
 $L(M) = \{w | w \leftarrow (a + b)^* \text{ and } n_a(w) = n_b(w)\}$  by final state
- b) Explain Different types of variation in TM.

Q.7 State and explain the block diagram of TM and construct a TM to accept the language.

08

$$L(M) = \{a^n b^n c^n | n \geq 1\}$$





- 8) UTM influenced the concept of \_\_\_\_\_.  
a) Computability  
b) Interpretive implementation of programming language  
c) Program and data is in same memory  
d) All of above
- 9) The entity which generate Language is termed as:  
a) Automata  
b) Tokens  
c) Grammar  
d) Data
- 10) There are \_\_\_\_\_ tuples in finite state machine.  
a) 4  
b) 5  
c) 6  
d) unlimited
- 11) PDA can be represented with the help of \_\_\_\_\_.  
a) Instantaneous description  
b) Transition diagram  
c) Transition table  
d) All of these
- 12) A push down automata is different than finite automata by \_\_\_\_\_.  
a) Its memory (stack)  
b) Number of states  
c) Both (a) and (b)  
d) None of these
- 13) The push down automata indicate the acceptance of input string in terms of \_\_\_\_\_.  
a) Final state  
b) Empty stack  
c) Both (a) and (b)  
d) None of these
- 14) Which type of symbols contain in the stack of PDA?  
a) Variable  
b) Terminal  
c) Both (a) and (b)  
d) None of these

Seat  
No.

**S.Y. (B.Tech) (Sem – II) (New) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

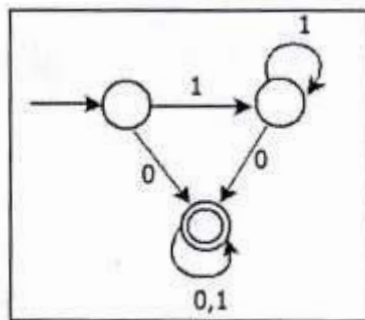
Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

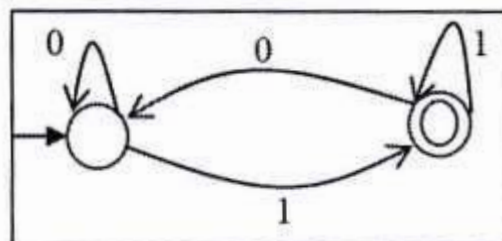
**Section – I****Q.2 Solve any three****12**

a) Identify the set of strings accepted by given following DFA.

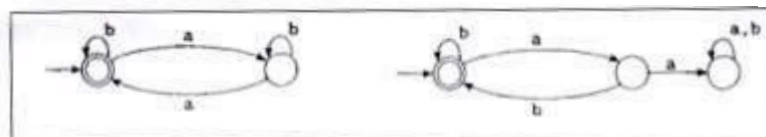
1)



2)

b) Construct regular expression corresponding to each of the following subset of  $\{0, 1\}^*$ 

- The language of all strings containing exactly two 0's
- The language C identifiers.

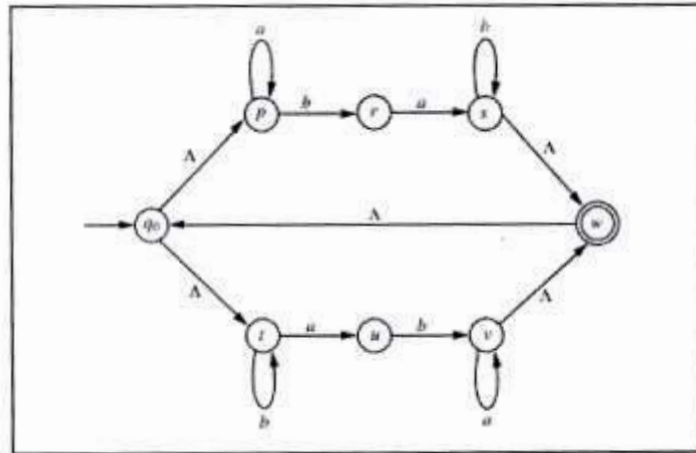
c) Associate given M1 and M2 be the FAs are pictured for L1, L2 resp. to represent a machine accepting following language  $L1 \cup L2$ ,  $L1 - L2$ d) Write a context free grammar equivalent for  $(011+1)^*(01)^*$ **Q.3 Solve any One****08**

a) Convert the following grammar into Chomsky normal form

 $S \rightarrow AACD$  $A \rightarrow aAb|^{\wedge}$  $C \rightarrow aC|a$  $D \rightarrow aDa|bDb|^{\wedge}$

b) Check whether following string is accepted by given NFA-<sup>^</sup>

- 1) aa
- 2) bab
- 3) ab
- 4) abab



**Q.4** Draw NFA-<sup>^</sup> for the following Regular expression

$$a^*b^*+(ba)^*$$

**08**

### Section – II

**Q.5** Solve any three

**12**

- a) State and explain pumping lemma for CFL.
- b) What is PDA? Explain with an example.
- c) Obtain a TM to accept the language  
 $L = \{w | w \leftarrow (0 + 1)^* \text{ containing substring } 001\}$
- d) Show that  $L = \{a^n b^n | n \geq 1\}$  is not regular.

**Q.6** Solve any One

**08**

- a) Obtain a PDA to accept the language  
 $L(M) = \{w | w \leftarrow (a + b)^* \text{ and } n_a(w) = n_b(w)\}$  by final state
- b) Explain Different types of variation in TM.

**Q.7** State and explain the block diagram of TM and construct a TM to accept the language.

**08**

$$L(M) = \{a^n b^n c^n | n \geq 1\}$$

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**S.Y. (B.Tech) (Sem – II) (New) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) There are \_\_\_\_\_ tuples in finite state machine.
  - a) 4
  - b) 5
  - c) 6
  - d) unlimited
- 2) PDA can be represented with the help of \_\_\_\_\_.
  - a) Instantaneous description
  - b) Transition diagram
  - c) Transition table
  - d) All of these
- 3) A push down automata is different than finite automata by \_\_\_\_\_.
  - a) Its memory (stack)
  - b) Number of states
  - c) Both (a) and (b)
  - d) None of these
- 4) The push down automata indicate the acceptance of input string in terms of \_\_\_\_\_.
  - a) Final state
  - b) Empty stack
  - c) Both (a) and (b)
  - d) None of these
- 5) Which type of symbols contain in the stack of PDA?
  - a) Variable
  - b) Terminal
  - c) Both (a) and (b)
  - d) None of these
- 6) Inability of FA is \_\_\_\_\_.
  - a) Writing
  - b) Finite memory
  - c) Sequential memory
  - d) all a, b, and c
- 7) The symbol  $Z_0$  in formal definition of PDA is used for \_\_\_\_\_.
  - a) Stack symbol
  - b) Input symbol
  - c) Both (a) and (b)
  - d) None of these
- 8) A grammar  $G = (V, T, P, S)$  is \_\_\_\_\_ if every production taken one of the two forms:
 

$B \rightarrow aC$

$B \rightarrow a$

  - a) Ambiguous
  - b) Regular
  - c) Non Regular
  - d) None of the mentioned

- 9) Which of the following strings is not generated by the following grammar?  
 $S \rightarrow SaSbS|e$
- |           |          |
|-----------|----------|
| a) aabb   | b) abab  |
| c) aababb | d) aaabb |
- 10) A PDA behaves like a FSM when it has number of auxiliary memory \_\_\_\_.
- |              |                 |
|--------------|-----------------|
| a) 0         | b) Exactly 2    |
| c) 2 or more | d) Both a and b |
- 11) The language  $L = \{ a^n b^n a^n : n \geq 1 \}$  is recognized by \_\_\_\_.
- |                 |                     |
|-----------------|---------------------|
| a) TM           | b) 2PDA             |
| c) Post Machine | d) All of the above |
- 12) The set of all strings over the alphabet  $S = \{a, b\}$  (including  $\epsilon$ ) is denoted by \_\_\_\_.
- |                |                |
|----------------|----------------|
| a) $(a + b)^*$ | b) $(a + b) +$ |
| c) $a + b +$   | d) $a^*b^*$    |
- 13) UTM influenced the concept of \_\_\_\_.
- |                                                        |
|--------------------------------------------------------|
| a) Computability                                       |
| b) Interpretive implementation of programming language |
| c) Program and data is in same memory                  |
| d) All of above                                        |
- 14) The entity which generate Language is termed as:
- |             |           |
|-------------|-----------|
| a) Automata | b) Tokens |
| c) Grammar  | d) Data   |

Seat  
No.

**S.Y. (B.Tech) (Sem – II) (New) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

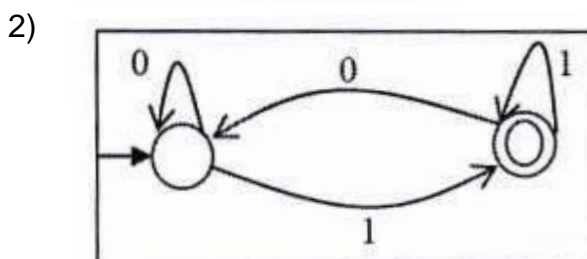
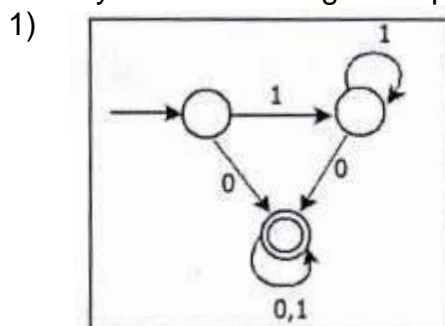
Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

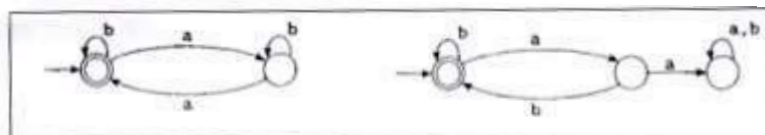
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I****Q.2 Solve any three****12**

a) Identify the set of strings accepted by given following DFA.

b) Construct regular expression corresponding to each of the following subset of  $\{0, 1\}^*$ 

- The language of all strings containing exactly two 0's
- The language C identifiers.

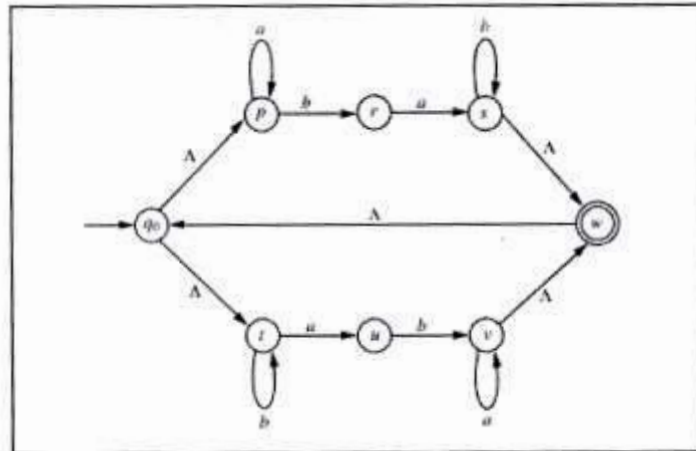
c) Associate given M1 and M2 be the FAs are pictured for L1, L2 resp. to represent a machine accepting following language  $L1 \cup L2$ ,  $L1 - L2$ d) Write a context free grammar equivalent for  $(011+1)^*(01)^*$ **Q.3 Solve any One****08**

a) Convert the following grammar into Chomsky normal form

 $S \rightarrow AACD$  $A \rightarrow aAb|^{\wedge}$  $C \rightarrow aC|a$  $D \rightarrow aDa|bDb|^{\wedge}$

b) Check whether following string is accepted by given NFA-<sup>^</sup>

- 1) aa
- 2) bab
- 3) ab
- 4) abab



Q.4 Draw NFA-<sup>^</sup> for the following Regular expression

$$a^*b^*+(ba)^*$$

08

### Section – II

Q.5 Solve any three

12

- a) State and explain pumping lemma for CFL.
- b) What is PDA? Explain with an example.
- c) Obtain a TM to accept the language  
 $L = \{w | w \leftarrow (0 + 1)^* \text{ containing substring } 001\}$
- d) Show that  $L = \{a^n b^n | n \geq 1\}$  is not regular.

Q.6 Solve any One

08

- a) Obtain a PDA to accept the language  
 $L(M) = \{w | w \leftarrow (a + b)^* \text{ and } n_a(w) = n_b(w)\}$  by final state
- b) Explain Different types of variation in TM.

Q.7 State and explain the block diagram of TM and construct a TM to accept the language.

08

$$L(M) = \{a^n b^n c^n | n \geq 1\}$$

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| <b>Seat No.</b> |  |
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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**Duration: 30 Minutes**

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- Page 1 of 12



- 10) \_\_\_\_\_ is a technique whereby multiple instructions are overlapped in execution.
- a) Assembly line
  - b) Pipelining
  - c) Collision line
  - d) Control line
- 11) The given set of instructions `add $s0, $t0, $t1; sub $t2, $s0, $t3;` shows the \_\_\_\_\_.
- a) Structural hazards
  - b) Data hazards
  - c) Forwarding bypassing
  - d) Pipeline stall
- 12) An \_\_\_\_\_ between instruction i and instruction j occurs when instruction j writes register or memory location that instruction i reads.
- a) Anti-dependence
  - b) Output dependence
  - c) Register renaming
  - d) None
- 13) The eliminating stage of WAR and WAW hazards, is often called \_\_\_\_\_.
- a) Execution
  - b) Anti-dependence
  - c) Data hazards
  - d) Dispatch
- 14) The term shared memory refers to the fact that the \_\_\_\_\_ is shared.
- a) Program space
  - b) Instruction space
  - c) Address space
  - d) Thread space

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| Seat No. |  |
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Set **P**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Answer any three:** **12**
- Explain with Suitable diagram the Von Neumann Architecture.
  - List the pseudo operations for the ARC assembly language.
  - Write a note on Cache memory.
  - Write a note on Generations of Computers.
- Q.3 Answer the following:** **16**
- Explain the System Bus model.
  - With an example explain Assembly language programs.
  - Explain ISA in detail.
  - Write a short note on.
    - Shared variable Model
    - Functional and Logic Model

**Section – II**

- Q.4 Answer any three:** **12**
- Compare Programmed I/O and Interrupt Driven I/O.
  - Explain major hurdles of Pipeline.
  - What is instruction level Parallelism?
  - Explain snooping protocol.
- Q.5 Answer the following:** **16**
- What are the types of I/O channels? Explain with suitable example.
  - Explain MESI protocol.
  - Explain the concept of overcoming data hazards with dynamic scheduling.
  - With neat diagram explain Centralized Shared Memory Architecture.

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| <b>Seat No.</b> |  |
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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

**Duration: 30 Minutes**

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- Page 4 of 12

- 9) \_\_\_\_\_ generation of computer started with using discrete transistor as basic components.
- |                    |                    |
|--------------------|--------------------|
| a) 1 <sup>st</sup> | b) 2 <sup>nd</sup> |
| c) 3 <sup>rd</sup> | d) 4 <sup>th</sup> |
- 10) The data path is made up of a collection of registers known as \_\_\_\_\_.
- |                  |                    |
|------------------|--------------------|
| a) Data file     | b) Collection file |
| c) Register file | d) Data path file  |
- 11) A cache memory is faster than main memory \_\_\_\_\_.
- |         |          |
|---------|----------|
| a) True | b) False |
|---------|----------|
- 12) The computer architecture aimed at reducing the time of execution of instructions is \_\_\_\_\_.
- |         |         |
|---------|---------|
| a) CISC | b) RISC |
| c) ISA  | d) ANNA |
- 13) ULSI stands for \_\_\_\_\_.
- |                                  |                                  |
|----------------------------------|----------------------------------|
| a) Ultra large scale integration | b) Under lower scale integration |
| c) Ultra lower scale integration | d) Under large scale integration |
- 14) The ENIAC consists of \_\_\_\_\_ vacuum.
- |           |             |
|-----------|-------------|
| a) 17,000 | b) 19,000   |
| c) 18,000 | d) 1,80,000 |

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Set 

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Answer any three:** **12**
- Explain with Suitable diagram the Von Neumann Architecture.
  - List the pseudo operations for the ARC assembly language.
  - Write a note on Cache memory.
  - Write a note on Generations of Computers.
- Q.3 Answer the following:** **16**
- Explain the System Bus model.
  - With an example explain Assembly language programs.
  - Explain ISA in detail.
  - Write a short note on.
    - Shared variable Model
    - Functional and Logic Model

**Section – II**

- Q.4 Answer any three:** **12**
- Compare Programmed I/O and Interrupt Driven I/O.
  - Explain major hurdles of Pipeline.
  - What is instruction level Parallelism?
  - Explain snooping protocol.
- Q.5 Answer the following:** **16**
- What are the types of I/O channels? Explain with suitable example.
  - Explain MESI protocol.
  - Explain the concept of overcoming data hazards with dynamic scheduling.
  - With neat diagram explain Centralized Shared Memory Architecture.

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Set **R**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) The given set of instructions add \$s0, \$t0, \$t1; sub \$t2, \$s0, \$t3; shows the \_\_\_\_\_.  
 a) Structural hazards                      b) Data hazards  
 c) Forwarding bypassing                  d) Pipeline stall
- 2) An \_\_\_\_\_ between instruction i and instruction j occurs when instruction j writes register or memory location that instruction i reads.  
 a) Anti-dependence                      b) Output dependence  
 c) Register renaming                      d) None
- 3) The eliminating stage of WAR and WAW hazards, is often called \_\_\_\_\_.  
 a) Execution                                  b) Anti-dependence  
 c) Data hazards                                d) Dispatch
- 4) The term shared memory refers to the fact that the \_\_\_\_\_ is shared.  
 a) Program space                              b) Instruction space  
 c) Address space                                d) Thread space
- 5) The ALU and control unit are frequently referred to collectively as \_\_\_\_\_.  
 a) CPU                                              b) MPU  
 c) Combo                                              d) DPU
- 6) \_\_\_\_\_ generation of computer started with using discrete transistor as basic components.  
 a) 1<sup>st</sup>                                                      b) 2<sup>nd</sup>  
 c) 3<sup>rd</sup>                                                      d) 4<sup>th</sup>
- 7) The data path is made up of a collection of registers known as \_\_\_\_\_.  
 a) Data file                                              b) Collection file  
 c) Register file                                              d) Data path file
- 8) A cache memory is faster than main memory \_\_\_\_\_.  
 a) True                                                      b) False
- 9) The computer architecture aimed at reducing the time of execution of instructions is \_\_\_\_\_.  
 a) CISC                                                      b) RISC  
 c) ISA                                                      d) ANNA

- 10)** ULSI stands for \_\_\_\_\_.  
a) Ultra large scale integration      b) Under lower scale integration  
c) Ultra lower scale integration      d) Under large scale integration
- 11)** The ENIAC consists of \_\_\_\_\_ vacuum.  
a) 17,000      b) 19,000  
c) 18,000      d) 1,80,000
- 12)** \_\_\_\_\_ Suitable for communicating with equipment.  
a) Human readable      b) Machine readable  
c) Communication      d) None
- 13)** The \_\_\_\_\_ contains I/O protocols that are mapped onto the transport layer.  
a) Physical layer      b) The cable and connector  
c) Common transport layer      d) Application layer
- 14)** \_\_\_\_\_ is a technique whereby multiple instructions are overlapped in execution.  
a) Assembly line      b) Pipelining  
c) Collision line      d) Control line

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Answer any three:** **12**
- a) Explain with Suitable diagram the Von Neumann Architecture.
  - b) List the pseudo operations for the ARC assembly language.
  - c) Write a note on Cache memory.
  - d) Write a note on Generations of Computers.
- Q.3 Answer the following:** **16**
- a) Explain the System Bus model.
  - b) With an example explain Assembly language programs.
  - c) Explain ISA in detail.
  - d) Write a short note on.
    - 1) Shared variable Model
    - 2) Functional and Logic Model

**Section – II**

- Q.4 Answer any three:** **12**
- a) Compare Programmed I/O and Interrupt Driven I/O.
  - b) Explain major hurdles of Pipeline.
  - c) What is instruction level Parallelism?
  - d) Explain snooping protocol.
- Q.5 Answer the following:** **16**
- a) What are the types of I/O channels? Explain with suitable example.
  - b) Explain MESI protocol.
  - c) Explain the concept of overcoming data hazards with dynamic scheduling.
  - d) With neat diagram explain Centralized Shared Memory Architecture.



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) ULSI stands for \_\_\_\_\_.  
 a) Ultra large scale integration      b) Under lower scale integration  
 c) Ultra lower scale integration      d) Under large scale integration
- 2) The ENIAC consists of \_\_\_\_\_ vacuum.  
 a) 17,000      b) 19,000  
 c) 18,000      d) 1,80,000
- 3) \_\_\_\_\_ Suitable for communicating with equipment.  
 a) Human readable      b) Machine readable  
 c) Communication      d) None
- 4) The \_\_\_\_\_ contains I/O protocols that are mapped onto the transport layer.  
 a) Physical layer      b) The cable and connector  
 c) Common transport layer      d) Application layer
- 5) \_\_\_\_\_ is a technique whereby multiple instructions are overlapped in execution.  
 a) Assembly line      b) Pipelining  
 c) Collision line      d) Control line
- 6) The given set of instructions add \$s0, \$t0, \$t1; sub \$t2, \$s0, \$t3; shows the \_\_\_\_\_.  
 a) Structural hazards      b) Data hazards  
 c) Forwarding bypassing      d) Pipeline stall
- 7) An \_\_\_\_\_ between instruction i and instruction j occurs when instruction j writes register or memory location that instruction i reads.  
 a) Anti-dependence      b) Output dependence  
 c) Register renaming      d) None
- 8) The eliminating stage of WAR and WAW hazards, is often called \_\_\_\_\_.  
 a) Execution      b) Anti-dependence  
 c) Data hazards      d) Dispatch

- 9) The term shared memory refers to the fact that the \_\_\_\_\_ is shared.
- a) Program space
  - b) Instruction space
  - c) Address space
  - d) Thread space
- 10) The ALU and control unit are frequently referred to collectively as \_\_\_\_\_.
- a) CPU
  - b) MPU
  - c) Combo
  - d) DPU
- 11) \_\_\_\_\_ generation of computer started with using discrete transistor as basic components.
- a) 1<sup>st</sup>
  - b) 2<sup>nd</sup>
  - c) 3<sup>rd</sup>
  - d) 4<sup>th</sup>
- 12) The data path is made up of a collection of registers known as \_\_\_\_\_.
- a) Data file
  - b) Collection file
  - c) Register file
  - d) Data path file
- 13) A cache memory is faster than main memory \_\_\_\_\_.
- a) True
  - b) False
- 14) The computer architecture aimed at reducing the time of execution of instructions is \_\_\_\_\_.
- a) CISC
  - b) RISC
  - c) ISA
  - d) ANNA

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Organization and Architecture**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Answer any three:** **12**
- a) Explain with Suitable diagram the Von Neumann Architecture.
  - b) List the pseudo operations for the ARC assembly language.
  - c) Write a note on Cache memory.
  - d) Write a note on Generations of Computers.
- Q.3 Answer the following:** **16**
- a) Explain the System Bus model.
  - b) With an example explain Assembly language programs.
  - c) Explain ISA in detail.
  - d) Write a short note on.
    - 1) Shared variable Model
    - 2) Functional and Logic Model

**Section – II**

- Q.4 Answer any three:** **12**
- a) Compare Programmed I/O and Interrupt Driven I/O.
  - b) Explain major hurdles of Pipeline.
  - c) What is instruction level Parallelism?
  - d) Explain snooping protocol.
- Q.5 Answer the following:** **16**
- a) What are the types of I/O channels? Explain with suitable example.
  - b) Explain MESI protocol.
  - c) Explain the concept of overcoming data hazards with dynamic scheduling.
  - d) With neat diagram explain Centralized Shared Memory Architecture.

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Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks: 14

14

- Page 1 of 12

- 10)** \_\_\_\_\_ allows you to connect and login to a remote computer.
- a) Telnet
  - b) FTP
  - c) HTTP
  - d) SMTP
- 11)** How many levels of addressing is provided in TCP/IP protocol?
- a) One
  - b) Two
  - c) Three
  - d) Four
- 12)** Secure shell (SSH) network protocol is used for \_\_\_\_\_.
- a) secure data communication
  - b) remote command-line login
  - c) remote command execution
  - d) all of the mentioned
- 13)** TCP sliding windows are \_\_\_\_\_ oriented.
- a) packet
  - b) segment
  - c) byte
  - d) none of the above
- 14)** A DNS client is called \_\_\_\_\_.
- a) DNS updater
  - b) DNS resolver
  - c) DNS handler
  - d) None of the mentioned

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**
- Differentiate between OSI model and TCP/IP protocol suite.
  - Explain multiple streams and multihoming services of SCTP.
  - Explain TCP Timers in detail.
  - Explain Socket System calls.
  - What is TCP? Explain features of TCP.
- Q.3 Solve any two.** **16**
- Explain TCP State Transition Diagram.
  - Describe with diagram the connectionless iterative server.
  - Sketch and explain the format of TCP segment header. List the services provided by TCP.

**Section – II**

- Q.4 Attempt any three.** **12**
- Explain the resolution in DNS.
  - What is SSH? Explain the concept of port forwarding.
  - Write a short note on POP3.
  - What is DHCP? Describe the DHCP operation when client and server are on the same network.
  - Write a short note on TFTP.
- Q.5 Attempt any two:** **16**
- Draw and explain DHCP packet format in detail.
  - Explain the E-mail architecture with its four scenarios.
  - Draw the diagram of SSH packet format and briefly describe its fields.

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Set **Q**

**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) FTP uses two well-known TCP ports: port 20 is used for the \_\_\_\_\_ connection.
  - a) Control
  - b) Data
  - c) Error
  - d) All above
- 2) The datagram socket is used by \_\_\_\_\_ processes.
  - a) UDP
  - b) TCP
  - c) SCTP
  - d) None of these
- 3) \_\_\_\_\_ allows you to connect and login to a remote computer.
  - a) Telnet
  - b) FTP
  - c) HTTP
  - d) SMTP
- 4) How many levels of addressing is provided in TCP/IP protocol?
  - a) One
  - b) Two
  - c) Three
  - d) Four
- 5) Secure shell (SSH) network protocol is used for \_\_\_\_\_.
  - a) secure data communication
  - b) remote command-line login
  - c) remote command execution
  - d) all of the mentioned
- 6) TCP sliding windows are \_\_\_\_\_ oriented.
  - a) packet
  - b) segment
  - c) byte
  - d) none of the above
- 7) A DNS client is called \_\_\_\_\_.
  - a) DNS updater
  - b) DNS resolver
  - c) DNS handler
  - d) None of the mentioned
- 8) Remote login can involve \_\_\_\_\_.
  - a) NVT
  - b) TELNET
  - c) TCP/IP
  - d) All of the above
- 9) DNS has two types of message: \_\_\_\_\_ and \_\_\_\_\_.
  - a) Request and reply
  - b) Query and response
  - c) Question and answer
  - d) True and false

- 10) Which of the following is/are Message Transfer Agent?
  - a) POP
  - b) IMAP
  - c) SMTP
  - d) Both a) and b)
- 11) Which modes are available with the POP3 protocol for email access?
  - a) Keep mode
  - b) Delete mode
  - c) Both a) and b)
  - d) None of these
- 12) To distinguish between different data chunks belonging to the same stream, SCTP uses \_\_\_\_\_.
  - a) TSNs
  - b) SIs
  - c) SSNs
  - d) None of the above
- 13) In DNS, each node in the tree has a label, which is a string with a maximum of \_\_\_\_\_ characters.
  - a) 46
  - b) 63
  - c) 65
  - d) 16
- 14) SSH \_\_\_\_\_ mechanism is sometimes referred to as SSH tunneling.
  - a) Encapsulation
  - b) port forwarding
  - c) Multiplexing
  - d) Numbering



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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**
- Differentiate between OSI model and TCP/IP protocol suite.
  - Explain multiple streams and multihoming services of SCTP.
  - Explain TCP Timers in detail.
  - Explain Socket System calls.
  - What is TCP? Explain features of TCP.
- Q.3 Solve any two.** **16**
- Explain TCP State Transition Diagram.
  - Describe with diagram the connectionless iterative server.
  - Sketch and explain the format of TCP segment header. List the services provided by TCP.

**Section – II**

- Q.4 Attempt any three.** **12**
- Explain the resolution in DNS.
  - What is SSH? Explain the concept of port forwarding.
  - Write a short note on POP3.
  - What is DHCP? Describe the DHCP operation when client and server are on the same network.
  - Write a short note on TFTP.
- Q.5 Attempt any two:** **16**
- Draw and explain DHCP packet format in detail.
  - Explain the E-mail architecture with its four scenarios.
  - Draw the diagram of SSH packet format and briefly describe its fields.

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Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Duration: 30 Minutes

**Q.1 Choose the correct alternatives from the options.**

- 1) How many levels of addressing is provided in TCP/IP protocol?  
a) One  
b) Two  
c) Three  
d) Four
- 2) Secure shell (SSH) network protocol is used for \_\_\_\_\_.  
a) secure data communication  
b) remote command-line login  
c) remote command execution  
d) all of the mentioned
- 3) TCP sliding windows are \_\_\_\_\_ oriented.  
a) packet  
b) segment  
c) byte  
d) none of the above
- 4) A DNS client is called \_\_\_\_\_.  
a) DNS updater  
b) DNS resolver  
c) DNS handler  
d) None of the mentioned
- 5) Remote login can involve \_\_\_\_\_.  
a) NVT  
b) TELNET  
c) TCP/IP  
d) All of the above
- 6) DNS has two types of message: \_\_\_\_\_ and \_\_\_\_\_.  
a) Request and reply  
b) Query and response  
c) Question and answer  
d) True and false
- 7) Which of the following is/are Message Transfer Agent?  
a) POP  
b) IMAP  
c) SMTP  
d) Both a) and b)
- 8) Which modes are available with the POP3 protocol for email access?  
a) Keep mode  
b) Delete mode  
c) Both a) and b)  
d) None of these
- 9) To distinguish between different data chunks belonging to the same stream, SCTP uses \_\_\_\_\_.  
a) TSNs  
b) SIs  
c) SSNs  
d) None of the above

- 10)** In DNS, each node in the tree has a label, which is a string with a maximum of \_\_\_\_\_ characters.
- |       |       |
|-------|-------|
| a) 46 | b) 63 |
| c) 65 | d) 16 |
- 11)** SSH \_\_\_\_\_ mechanism is sometimes referred to as SSH tunneling.
- |                  |                    |
|------------------|--------------------|
| a) Encapsulation | b) port forwarding |
| c) Multiplexing  | d) Numbering       |
- 12)** FTP uses two well-known TCP ports: port 20 is used for the \_\_\_\_\_ connection.
- |            |              |
|------------|--------------|
| a) Control | b) Data      |
| c) Error   | d) All above |
- 13)** The datagram socket is used by \_\_\_\_\_ processes.
- |         |                  |
|---------|------------------|
| a) UDP  | b) TCP           |
| c) SCTP | d) None of these |
- 14)** \_\_\_\_\_ allows you to connect and login to a remote computer.
- |           |         |
|-----------|---------|
| a) Telnet | b) FTP  |
| c) HTTP   | d) SMTP |

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**
- Differentiate between OSI model and TCP/IP protocol suite.
  - Explain multiple streams and multihoming services of SCTP.
  - Explain TCP Timers in detail.
  - Explain Socket System calls.
  - What is TCP? Explain features of TCP.
- Q.3 Solve any two.** **16**
- Explain TCP State Transition Diagram.
  - Describe with diagram the connectionless iterative server.
  - Sketch and explain the format of TCP segment header. List the services provided by TCP.

**Section – II**

- Q.4 Attempt any three.** **12**
- Explain the resolution in DNS.
  - What is SSH? Explain the concept of port forwarding.
  - Write a short note on POP3.
  - What is DHCP? Describe the DHCP operation when client and server are on the same network.
  - Write a short note on TFTP.
- Q.5 Attempt any two:** **16**
- Draw and explain DHCP packet format in detail.
  - Explain the E-mail architecture with its four scenarios.
  - Draw the diagram of SSH packet format and briefly describe its fields.

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Set **S**

**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In DNS, each node in the tree has a label, which is a string with a maximum of \_\_\_\_\_ characters.
  - a) 46
  - b) 63
  - c) 65
  - d) 16
- 2) SSH \_\_\_\_\_ mechanism is sometimes referred to as SSH tunneling.
  - a) Encapsulation
  - b) port forwarding
  - c) Multiplexing
  - d) Numbering
- 3) FTP uses two well-known TCP ports: port 20 is used for the \_\_\_\_\_ connection.
  - a) Control
  - b) Data
  - c) Error
  - d) All above
- 4) The datagram socket is used by \_\_\_\_\_ processes.
  - a) UDP
  - b) TCP
  - c) SCTP
  - d) None of these
- 5) \_\_\_\_\_ allows you to connect and login to a remote computer.
  - a) Telnet
  - b) FTP
  - c) HTTP
  - d) SMTP
- 6) How many levels of addressing is provided in TCP/IP protocol?
  - a) One
  - b) Two
  - c) Three
  - d) Four
- 7) Secure shell (SSH) network protocol is used for \_\_\_\_\_.
  - a) secure data communication
  - b) remote command-line login
  - c) remote command execution
  - d) all of the mentioned
- 8) TCP sliding windows are \_\_\_\_\_ oriented.
  - a) packet
  - b) segment
  - c) byte
  - d) none of the above
- 9) A DNS client is called \_\_\_\_\_.
  - a) DNS updater
  - b) DNS resolver
  - c) DNS handler
  - d) None of the mentioned

- 10)** Remote login can involve \_\_\_\_\_
- a) NVT
  - b) TELNET
  - c) TCP/IP
  - d) All of the above
- 11)** DNS has two types of message: \_\_\_\_\_ and \_\_\_\_\_.
- a) Request and reply
  - b) Query and response
  - c) Question and answer
  - d) True and false
- 12)** Which of the following is/are Message Transfer Agent?
- a) POP
  - b) IMAP
  - c) SMTP
  - d) Both a) and b)
- 13)** Which modes are available with the POP3 protocol for email access?
- a) Keep mode
  - b) Delete mode
  - c) Both a) and b)
  - d) None of these
- 14)** To distinguish between different data chunks belonging to the same stream, SCTP uses \_\_\_\_\_.
- a) TSNs
  - b) SIs
  - c) SSNs
  - d) None of the above

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**
- a) Differentiate between OSI model and TCP/IP protocol suite.
  - b) Explain multiple streams and multihoming services of SCTP.
  - c) Explain TCP Timers in detail.
  - d) Explain Socket System calls.
  - e) What is TCP? Explain features of TCP.
- Q.3 Solve any two.** **16**
- a) Explain TCP State Transition Diagram.
  - b) Describe with diagram the connectionless iterative server.
  - c) Sketch and explain the format of TCP segment header. List the services provided by TCP.

**Section – II**

- Q.4 Attempt any three.** **12**
- a) Explain the resolution in DNS.
  - b) What is SSH? Explain the concept of port forwarding.
  - c) Write a short note on POP3.
  - d) What is DHCP? Describe the DHCP operation when client and server are on the same network.
  - e) Write a short note on TFTP.
- Q.5 Attempt any two:** **16**
- a) Draw and explain DHCP packet format in detail.
  - b) Explain the E-mail architecture with its four scenarios.
  - c) Draw the diagram of SSH packet format and briefly describe its fields.

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No.**

Max. Marks: 70

Marks: 14

14

- Page 1 of 20



- 7) Match the following and choose the correct option
- | Rule                       | No. of subintervals |
|----------------------------|---------------------|
| 1) Simpson's (1/3) rd rule | p) Any              |
| 2) Simpson's (3/8) th rule | q) Multiple of 6    |
| 3) Weddle's rule           | r) Multiple of 3    |
|                            | s) Multiple of 2    |
- a)  $1 - p, 2 - q, 3 - s$                       b)  $1 - r, 2 - s, 3 - q$   
c)  $1 - s, 2 - p, 3 - s$                       d)  $1 - s, 2 - r, 3 - q$
- 8) While solving an assignment problem an activity is assigned to a resource with zero opportunity cost the objective is to \_\_\_\_\_.  
a) Reduce the cost of assignment to zero  
b) Minimize total cost of an assignment  
c) Reduce the cost of that particular assignment to minimum  
d) none
- 9) Let  $A, B \in F(x)$  then A is said to be subset of B if for all  $x \in X$  \_\_\_\_\_.  
a)  $A(x) \geq B(x)$                                       b)  $A(x) \leq B(x)$   
c)  $A(x) > B(x)$                                       d) None
- 10) If A is a fuzzy set defined on  $X = [2, 4]$  by  $A(x) = \frac{x-2}{2}$  then  $\alpha_A =$  \_\_\_\_\_.  
a)  $[2, 4]$                                                       b)  $[2\alpha + 2, 4]$   
c) Both a and b                                              d) None
- 11) For the maximization LPP the simplex method is terminated when all the net evaluations are \_\_\_\_\_.  
a) Negative                                                      b) Non-negative  
c) Zero                                                              d) All of the above
- 12) A is a fuzzy set,  $A(x) = \bar{A}(x), x \in X$  then x is \_\_\_\_\_.  
a) special point                                                      b) middle point  
c) equilibrium point                                                      d) point of intersection
- 13) For fuzzy sets A, B  $|A| = 3$   $|B| = 10, |A \cap B| = 0.9$  then  $S(A, B) =$  \_\_\_\_\_.  
a) 0.09                                                              b) 0.9  
c) 0.3                                                              d) 0.99
- 14) Which of the following is not a fuzzy number?  
a)  $A + B$                                                               b)  $A - B$   
c)  $\text{MIN}(A, B)$                                                               d) None

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.**

**09**

- Find the Positive root of the equation  $x^3 - \log_{10} x - 12 = 0$  correct up to three decimal places by using False Position method.
- Solve the system of equations by using Gauss Elimination method.  
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$
- Find the value of  $\sqrt{24}$  by using Newton Raphson method. Correct up to four decimal places.
- State the Trapezoidal Rule and evaluate  $\int_0^6 \frac{1}{1+x^2} dx$
- Find first three approximations by using Gauss Jacobi method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = 3$

**Q.3 Attempt any three of the following.**

**09**

- Apply Gaussian Quadrature 2-point formula to evaluate  $\int_{-2}^2 e^{-x/2} dx$
- Discover the double root of the equation  $x^3 - 5x^2 + 8x - 4 = 0$ . Which is near to 1.8 by using Newton Raphson method.
- Find first five approximations of the Eigen values of the given matrix by using Power method  $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$
- Apply Simpson's three-eighth rule to evaluate  $\int_{0.2}^{1.4} (\sin x - \log x + e^x) dx$  by take  $h = 0.2$ .
- Solve the system of equations by using Gauss Jordan method  
 $2x - 3y - z = 5, 4x + 4y - 3z = 3, 2x - 3y + 2z = 2$

**Q.4 Attempt any two of the following.**

**10**

- Solve the system of equations by using L. U. Decomposition method  
 $2x + 3y + z = 9, x + 2y + 3z = 6, 3x + y + 2z = 8$
- Solve the system of non-linear equations  $x^2 + y = 11, y^2 + x = 7$  take initial approximations as  $x_0 = 3.5$  and  $y_0 = -1.8$
- Apply Romberg integration method to evaluate  $\int_0^{0.5} \frac{x}{\sin x} dx$

## Section – II

09

**Q.5 Attempt any three of the following.**

- a) Define membership function and fuzzy set  
 b) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find  $(A \cup B)'$ ,  $A \cup B'$ 

- c) Evaluate the following

- i)  $[1,3] + [5,8]$   
 ii)  $[1,3] - [5,8]$   
 iii)  $[1,3] \cdot [5,8]$   
 iv)  $[1,3]/[5,8]$

- d) Find the equilibrium point for  $C(x) = \frac{x}{x+1}$   
 e) Find I.B.F.S by using Hungarian method

| Warehouse<br>Factory | I  | II | III | IV |
|----------------------|----|----|-----|----|
| A                    | 15 | 14 | 12  | 16 |
| B                    | 23 | 22 | 25  | 24 |
| C                    | 31 | 34 | 32  | 33 |
| D                    | 21 | 32 | 44  | 53 |

09

**Q.6 Attempt any three of the following.**

- a) Determine whether the following fuzzy set is a fuzzy number

$$C(x) = x \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{otherwise}$$

- b) Prove that  $\alpha_{+(A \cap B)} = \alpha_{+A} \cap \alpha_{+B}$

- c) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find fuzzy set  $0.4_{A \cap B}$ 

- d) Solve the Assignment Problem

| Tasks | E  | F  | G  | H  |
|-------|----|----|----|----|
| A     | 18 | 26 | 17 | 11 |
| B     | 13 | 28 | 14 | 26 |
| C     | 38 | 19 | 18 | 15 |
| D     | 19 | 26 | 24 | 10 |

- e) Maximize  $Z = 3x_1 + 2x_2$ , subject to

$$x_1 + x_2 \leq 4, \quad x_1 - x_2 \leq 2, \quad x_1, x_2 \geq 0$$

**Q.7 Attempt any two**

- a)**
- State first decomposition theorem and find
- $f(A)$
- where

$$A(x) = \frac{0.7}{-5} + \frac{0.6}{-4} + \frac{1}{-3} + \frac{0.4}{-2} + \frac{0.45}{-1} + \frac{0.75}{0} + \frac{0.81}{1} + \frac{0.34}{2} + \frac{1}{3} + \frac{0.17}{4} + \frac{0.91}{5}$$

$$X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$F: x \rightarrow y \text{ defined by } f(x) = x^2$$

- b)**
- Find
- $A + B$
- for the following membership function:

$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$

$$= \frac{3-x}{2} \quad 1 < x < 3$$

$$= 0 \quad \text{otherwise}$$

$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$

$$= \frac{5-x}{2} \quad 3 < x \leq 5$$

$$= 0 \quad \text{otherwise}$$

- c)**
- Solve the Assignment Problem

Machine

| Job | A  | B  | C  | D  |
|-----|----|----|----|----|
| 1   | 18 | 24 | 28 | 32 |
| 2   | 8  | 13 | 17 | 19 |
| 3   | 10 | 15 | 19 | 22 |

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) While solving an assignment problem an activity is assigned to a resource with zero opportunity cost the objective is to \_\_\_\_\_.  
 a) Reduce the cost of assignment to zero  
 b) Minimize total cost of an assignment  
 c) Reduce the cost of that particular assignment to minimum  
 d) none
- 2) Let  $A, B \in F(x)$  then A is said to be subset of B if for all  $x \in X$  \_\_\_\_\_.  
 a)  $A(x) \geq B(x)$   
 b)  $A(x) \leq B(x)$   
 c)  $A(x) > B(x)$   
 d) None
- 3) If A is a fuzzy set defined on  $X = [2,4]$  by  $A(x) = \frac{x-2}{2}$  then  $\alpha_A =$  \_\_\_\_\_.  
 a)  $[2,4]$   
 b)  $[2\alpha + 2,4]$   
 c) Both a and b  
 d) None
- 4) For the maximization LPP the simplex method is terminated when all the net evaluations are \_\_\_\_\_.  
 a) Negative  
 b) Non-negative  
 c) Zero  
 d) All of the above
- 5) A is a fuzzy set,  $A(x) = \bar{A}(x), x \in X$  then x is \_\_\_\_\_.  
 a) special point  
 b) middle point  
 c) equilibrium point  
 d) point of intersection
- 6) For fuzzy sets A, B  $|A| = 3$   $|B| = 10$ ,  $|A \cap B| = 0.9$  then  $S(A, B) =$  \_\_\_\_\_.  
 a) 0.09  
 b) 0.9  
 c) 0.3  
 d) 0.99
- 7) Which of the following is not a fuzzy number?  
 a)  $A + B$   
 b)  $A - B$   
 c)  $\text{MIN}(A, B)$   
 d) None

- Page 7 of 20

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.**

**09**

- Find the Positive root of the equation  $x^3 - \log_{10} x - 12 = 0$  correct up to three decimal places by using False Position method.
- Solve the system of equations by using Gauss Elimination method.  
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$
- Find the value of  $\sqrt{24}$  by using Newton Raphson method. Correct up to four decimal places.
- State the Trapezoidal Rule and evaluate  $\int_0^6 \frac{1}{1+x^2} dx$
- Find first three approximations by using Gauss Jacobi method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = 3$

**Q.3 Attempt any three of the following.**

**09**

- Apply Gaussian Quadrature 2-point formula to evaluate  $\int_{-2}^2 e^{-x/2} dx$
- Discover the double root of the equation  $x^3 - 5x^2 + 8x - 4 = 0$ . Which is near to 1.8 by using Newton Raphson method.
- Find first five approximations of the Eigen values of the given matrix by using Power method  $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$
- Apply Simpson's three-eighth rule to evaluate  $\int_{0.2}^{1.4} (\sin x - \log x + e^x) dx$  by take  $h = 0.2$ .
- Solve the system of equations by using Gauss Jordan method  
 $2x - 3y - z = 5, 4x + 4y - 3z = 3, 2x - 3y + 2z = 2$

**Q.4 Attempt any two of the following.**

**10**

- Solve the system of equations by using L. U. Decomposition method  
 $2x + 3y + z = 9, x + 2y + 3z = 6, 3x + y + 2z = 8$
- Solve the system of non-linear equations  $x^2 + y = 11, y^2 + x = 7$  take initial approximations as  $x_0 = 3.5$  and  $y_0 = -1.8$
- Apply Romberg integration method to evaluate  $\int_0^{0.5} \frac{x}{\sin x} dx$

## Section – II

**Q.5 Attempt any three of the following.**

09

- a) Define membership function and fuzzy set  
 b) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find  $(A \cup B)'$ ,  $A \cup B'$ 

- c) Evaluate the following

- i)  $[1,3] + [5,8]$   
 ii)  $[1,3] - [5,8]$   
 iii)  $[1,3] \cdot [5,8]$   
 iv)  $[1,3]/[5,8]$

- d) Find the equilibrium point for  $C(x) = \frac{x}{x+1}$   
 e) Find I.B.F.S by using Hungarian method

| Warehouse<br>Factory | I  | II | III | IV |
|----------------------|----|----|-----|----|
| A                    | 15 | 14 | 12  | 16 |
| B                    | 23 | 22 | 25  | 24 |
| C                    | 31 | 34 | 32  | 33 |
| D                    | 21 | 32 | 44  | 53 |

**Q.6 Attempt any three of the following.**

09

- a) Determine whether the following fuzzy set is a fuzzy number

$$C(x) = x \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{otherwise}$$

- b) Prove that  $\alpha_{+(A \cap B)} = \alpha_{+A} \cap \alpha_{+B}$

- c) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find fuzzy set  $0.4_{A \cap B}$ 

- d) Solve the Assignment Problem

| Tasks | E  | F  | G  | H  |
|-------|----|----|----|----|
| A     | 18 | 26 | 17 | 11 |
| B     | 13 | 28 | 14 | 26 |
| C     | 38 | 19 | 18 | 15 |
| D     | 19 | 26 | 24 | 10 |

- e) Maximize  $Z = 3x_1 + 2x_2$ , subject to

$$x_1 + x_2 \leq 4, \quad x_1 - x_2 \leq 2, \quad x_1, x_2 \geq 0$$



**Q.7 Attempt any two**

- a)**
- State first decomposition theorem and find
- $f(A)$
- where

$$A(x) = \frac{0.7}{-5} + \frac{0.6}{-4} + \frac{1}{-3} + \frac{0.4}{-2} + \frac{0.45}{-1} + \frac{0.75}{0} + \frac{0.81}{1} + \frac{0.34}{2} + \frac{1}{3} + \frac{0.17}{4} + \frac{0.91}{5}$$

$$X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$F: x \rightarrow y \text{ defined by } f(x) = x^2$$

- b)**
- Find
- $A + B$
- for the following membership function:

$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$

$$= \frac{3-x}{2} \quad 1 < x < 3$$

$$= 0 \quad \text{otherwise}$$

$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$

$$= \frac{5-x}{2} \quad 3 < x \leq 5$$

$$= 0 \quad \text{otherwise}$$

- c)**
- Solve the Assignment Problem

Machine

| Job | A  | B  | C  | D  |
|-----|----|----|----|----|
| 1   | 18 | 24 | 28 | 32 |
| 2   | 8  | 13 | 17 | 19 |
| 3   | 10 | 15 | 19 | 22 |

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) For the maximization LPP the simplex method is terminated when all the net evaluations are \_\_\_\_\_.
  - a) Negative
  - b) Non-negative
  - c) Zero
  - d) All of the above
- 2)  $A$  is a fuzzy set,  $A(x) = \bar{A}(x), x \in X$  then  $x$  is \_\_\_\_\_.
  - a) special point
  - b) middle point
  - c) equilibrium point
  - d) point of intersection
- 3) For fuzzy sets  $A, B$   $|A| = 3$   $|B| = 10, |A \cap B| = 0.9$  then  $S(A, B) =$  \_\_\_\_\_.
  - a) 0.09
  - b) 0.9
  - c) 0.3
  - d) 0.99
- 4) Which of the following is not a fuzzy number?
  - a)  $A + B$
  - b)  $A - B$
  - c)  $\text{MIN}(A, B)$
  - d) None
- 5) The interval in which a real root of the equation  $x^3 - 2x - 5 = 0$  lies is \_\_\_\_\_.
  - a) (1,2)
  - b) (0,1)
  - c) (2,3)
  - d) (3,4)
- 6) The formula used for solving the equation using Regula Falsi method is
  - i)  $x = \frac{bf(a) - af(b)}{f(a) - f(b)}$
  - ii)  $x = \frac{af(b) - bf(a)}{f(a) - f(b)}$
  - a) Only i is Correct
  - b) Only ii is Correct
  - c) Both i, ii are Correct
  - d) Both i, ii are Incorrect
- 7) The coefficient matrix is transformed to \_\_\_\_\_ form in Gauss Elimination method.
  - a) Diagonal
  - b) Upper triangular
  - c) Lower triangular
  - d) None of a, b, c

- 8) Which of the following is not direct method?  
 a) Gauss – Elimination                      b) Gauss – Jordan  
 c) Gauss – Seidal                              d) Crout's method
- 9) To apply Simpson's one-third rule the number of sub-intervals must be \_\_\_\_\_.  
 a) Even                                              b) Odd  
 c) Multiple of 3                                  d) Multiple of 6
- 10) Which of the following is false?  
 a) Error in Trapezoidal rule is of order  $h^2$   
 b) Error in Weddle's rule is of order  $h^7$   
 c) Error in Simpson's  $3/8^{\text{th}}$  rule is of order  $h^5$   
 d) Error in Simpson's  $1/3^{\text{rd}}$  rule is of order  $h$
- 11) Match the following and choose the correct option
- | Rule                       | No. of subintervals    |
|----------------------------|------------------------|
| 1) Simpson's (1/3) rd rule | p) Any                 |
| 2) Simpson's (3/8) th rule | q) Multiple of 6       |
| 3) Weddle's rule           | r) Multiple of 3       |
|                            | s) Multiple of 2       |
| a) 1 – p, 2 – q, 3 – s     | b) 1 – r, 2 – s, 3 – q |
| c) 1 – s, 2 – p, 3 – s     | d) 1 – s, 2 – r, 3 – q |
- 12) While solving an assignment problem an activity is assigned to a resource with zero opportunity cost the objective is to \_\_\_\_\_.  
 a) Reduce the cost of assignment to zero  
 b) Minimize total cost of an assignment  
 c) Reduce the cost of that particular assignment to minimum  
 d) none
- 13) Let  $A, B \in F(X)$  then A is said to be subset of B if for all  $x \in X$  \_\_\_\_\_.  
 a)  $A(x) \geq B(x)$                                   b)  $A(x) \leq B(x)$   
 c)  $A(x) > B(x)$                                   d) None
- 14) If A is a fuzzy set defined on  $X = [2,4]$  by  $A(x) = \frac{x-2}{2}$  then  $\alpha_A =$  \_\_\_\_\_.  
 a)  $[2,4]$                                               b)  $[2\alpha + 2,4)$   
 c) Both a and b                                      d) None

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.**

09

- Find the Positive root of the equation  $x^3 - \log_{10} x - 12 = 0$  correct up to three decimal places by using False Position method.
- Solve the system of equations by using Gauss Elimination method.  
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$
- Find the value of  $\sqrt{24}$  by using Newton Raphson method. Correct up to four decimal places.
- State the Trapezoidal Rule and evaluate  $\int_0^6 \frac{1}{1+x^2} dx$
- Find first three approximations by using Gauss Jacobi method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = 3$

**Q.3 Attempt any three of the following.**

09

- Apply Gaussian Quadrature 2-point formula to evaluate  $\int_{-2}^2 e^{-x/2} dx$
- Discover the double root of the equation  $x^3 - 5x^2 + 8x - 4 = 0$ . Which is near to 1.8 by using Newton Raphson method.
- Find first five approximations of the Eigen values of the given matrix by using Power method  $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$
- Apply Simpson's three-eighth rule to evaluate  $\int_{0.2}^{1.4} (\sin x - \log x + e^x) dx$  by take  $h = 0.2$ .
- Solve the system of equations by using Gauss Jordan method  
 $2x - 3y - z = 5, 4x + 4y - 3z = 3, 2x - 3y + 2z = 2$

**Q.4 Attempt any two of the following.**

10

- Solve the system of equations by using L. U. Decomposition method  
 $2x + 3y + z = 9, x + 2y + 3z = 6, 3x + y + 2z = 8$
- Solve the system of non-linear equations  $x^2 + y = 11, y^2 + x = 7$  take initial approximations as  $x_0 = 3.5$  and  $y_0 = -1.8$
- Apply Romberg integration method to evaluate  $\int_0^{0.5} \frac{x}{\sin x} dx$

## Section – II

**Q.5 Attempt any three of the following.**

09

- a) Define membership function and fuzzy set  
 b) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find  $(A \cup B)'$ ,  $A \cup B'$ 

- c) Evaluate the following

- i)  $[1,3] + [5,8]$   
 ii)  $[1,3] - [5,8]$   
 iii)  $[1,3] \cdot [5,8]$   
 iv)  $[1,3]/[5,8]$

- d) Find the equilibrium point for  $C(x) = \frac{x}{x+1}$   
 e) Find I.B.F.S by using Hungarian method

| Warehouse<br>Factory | I  | II | III | IV |
|----------------------|----|----|-----|----|
| A                    | 15 | 14 | 12  | 16 |
| B                    | 23 | 22 | 25  | 24 |
| C                    | 31 | 34 | 32  | 33 |
| D                    | 21 | 32 | 44  | 53 |

**Q.6 Attempt any three of the following.**

09

- a) Determine whether the following fuzzy set is a fuzzy number

$$C(x) = x \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{otherwise}$$

- b) Prove that  $\alpha_{+(A \cap B)} = \alpha_{+A} \cap \alpha_{+B}$

- c) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find fuzzy set  $0.4_{A \cap B}$ 

- d) Solve the Assignment Problem

| Tasks | E  | F  | G  | H  |
|-------|----|----|----|----|
| A     | 18 | 26 | 17 | 11 |
| B     | 13 | 28 | 14 | 26 |
| C     | 38 | 19 | 18 | 15 |
| D     | 19 | 26 | 24 | 10 |

- e) Maximize  $Z = 3x_1 + 2x_2$ , subject to

$$x_1 + x_2 \leq 4, \quad x_1 - x_2 \leq 2, \quad x_1, x_2 \geq 0$$

**Q.7 Attempt any two**

- a)**
- State first decomposition theorem and find
- $f(A)$
- where

$$A(x) = \frac{0.7}{-5} + \frac{0.6}{-4} + \frac{1}{-3} + \frac{0.4}{-2} + \frac{0.45}{-1} + \frac{0.75}{0} + \frac{0.81}{1} + \frac{0.34}{2} + \frac{1}{3} + \frac{0.17}{4} + \frac{0.91}{5}$$

$$X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$F: x \rightarrow y \text{ defined by } f(x) = x^2$$

- b)**
- Find
- $A + B$
- for the following membership function:

$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$

$$= \frac{3-x}{2} \quad 1 < x < 3$$

$$= 0 \quad \text{otherwise}$$

$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$

$$= \frac{5-x}{2} \quad 3 < x \leq 5$$

$$= 0 \quad \text{otherwise}$$

- c)**
- Solve the Assignment Problem

Machine

| Job | A  | B  | C  | D  |
|-----|----|----|----|----|
| 1   | 18 | 24 | 28 | 32 |
| 2   | 8  | 13 | 17 | 19 |
| 3   | 10 | 15 | 19 | 22 |

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Set

S

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is false?
  - a) Error in Trapezoidal rule is of order  $h^2$
  - b) Error in Weddle's rule is of order  $h^7$
  - c) Error in Simpson's  $3/8^{\text{th}}$  rule is of order  $h^5$
  - d) Error in Simpson's  $1/3^{\text{rd}}$  rule is of order  $h$
- 2) Match the following and choose the correct option
 

| Rule                       | No. of subintervals |
|----------------------------|---------------------|
| 1) Simpson's (1/3) rd rule | p) Any              |
| 2) Simpson's (3/8) th rule | q) Multiple of 6    |
| 3) Weddle's rule           | r) Multiple of 3    |
|                            | s) Multiple of 2    |

  - a) 1 – p, 2 – q, 3 – s
  - b) 1 – r, 2 – s, 3 – q
  - c) 1 – s, 2 – p, 3 – s
  - d) 1 – s, 2 – r, 3 – q
- 3) While solving an assignment problem an activity is assigned to a resource with zero opportunity cost the objective is to \_\_\_\_\_.
  - a) Reduce the cost of assignment to zero
  - b) Minimize total cost of an assignment
  - c) Reduce the cost of that particular assignment to minimum
  - d) none
- 4) Let  $A, B \in F(X)$  then A is said to be subset of B if for all  $x \in X$  \_\_\_\_\_.
  - a)  $A(x) \geq B(x)$
  - b)  $A(x) \leq B(x)$
  - c)  $A(x) > B(x)$
  - d) None
- 5) If A is a fuzzy set defined on  $X = [2, 4]$  by  $A(x) = \frac{x-2}{2}$  then  $\alpha_A =$  \_\_\_\_\_.
  - a)  $[2, 4]$
  - b)  $[2\alpha + 2, 4]$
  - c) Both a and b
  - d) None





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Set **S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.**

**09**

- Find the Positive root of the equation  $x^3 - \log_{10} x - 12 = 0$  correct up to three decimal places by using False Position method.
- Solve the system of equations by using Gauss Elimination method.  
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$
- Find the value of  $\sqrt{24}$  by using Newton Raphson method. Correct up to four decimal places.
- State the Trapezoidal Rule and evaluate  $\int_0^6 \frac{1}{1+x^2} dx$
- Find first three approximations by using Gauss Jacobi method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = 3$

**Q.3 Attempt any three of the following.**

**09**

- Apply Gaussian Quadrature 2-point formula to evaluate  $\int_{-2}^2 e^{-x/2} dx$
- Discover the double root of the equation  $x^3 - 5x^2 + 8x - 4 = 0$ . Which is near to 1.8 by using Newton Raphson method.
- Find first five approximations of the Eigen values of the given matrix by using Power method  $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$
- Apply Simpson's three-eighth rule to evaluate  $\int_{0.2}^{1.4} (\sin x - \log x + e^x) dx$  by take  $h = 0.2$ .
- Solve the system of equations by using Gauss Jordan method  
 $2x - 3y - z = 5, 4x + 4y - 3z = 3, 2x - 3y + 2z = 2$

**Q.4 Attempt any two of the following.**

**10**

- Solve the system of equations by using L. U. Decomposition method  
 $2x + 3y + z = 9, x + 2y + 3z = 6, 3x + y + 2z = 8$
- Solve the system of non-linear equations  $x^2 + y = 11, y^2 + x = 7$  take initial approximations as  $x_0 = 3.5$  and  $y_0 = -1.8$
- Apply Romberg integration method to evaluate  $\int_0^{0.5} \frac{x}{\sin x} dx$

## Section – II

**Q.5 Attempt any three of the following.**

09

- a) Define membership function and fuzzy set  
 b) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find  $(A \cup B)'$ ,  $A \cup B'$ 

- c) Evaluate the following

- i)  $[1,3] + [5,8]$   
 ii)  $[1,3] - [5,8]$   
 iii)  $[1,3] \cdot [5,8]$   
 iv)  $[1,3]/[5,8]$

- d) Find the equilibrium point for  $C(x) = \frac{x}{x+1}$   
 e) Find I.B.F.S by using Hungarian method

| Warehouse<br>Factory | I  | II | III | IV |
|----------------------|----|----|-----|----|
| A                    | 15 | 14 | 12  | 16 |
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| C                    | 31 | 34 | 32  | 33 |
| D                    | 21 | 32 | 44  | 53 |

**Q.6 Attempt any three of the following.**

09

- a) Determine whether the following fuzzy set is a fuzzy number

$$C(x) = x \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{otherwise}$$

- b) Prove that  $\alpha_{+(A \cap B)} = \alpha_{+A} \cap \alpha_{+B}$

- c) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find fuzzy set  $0.4_{A \cap B}$ 

- d) Solve the Assignment Problem

| Tasks | E  | F  | G  | H  |
|-------|----|----|----|----|
| A     | 18 | 26 | 17 | 11 |
| B     | 13 | 28 | 14 | 26 |
| C     | 38 | 19 | 18 | 15 |
| D     | 19 | 26 | 24 | 10 |

- e) Maximize  $Z = 3x_1 + 2x_2$ , subject to

$$x_1 + x_2 \leq 4, \quad x_1 - x_2 \leq 2, \quad x_1, x_2 \geq 0$$

**Q.7 Attempt any two**

- a)**
- State first decomposition theorem and find
- $f(A)$
- where

$$A(x) = \frac{0.7}{-5} + \frac{0.6}{-4} + \frac{1}{-3} + \frac{0.4}{-2} + \frac{0.45}{-1} + \frac{0.75}{0} + \frac{0.81}{1} + \frac{0.34}{2} + \frac{1}{3} + \frac{0.17}{4} + \frac{0.91}{5}$$

$$X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$F: x \rightarrow y \text{ defined by } f(x) = x^2$$

- b)**
- Find
- $A + B$
- for the following membership function:

$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$

$$= \frac{3-x}{2} \quad 1 < x < 3$$

$$= 0 \quad \text{otherwise}$$

$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$

$$= \frac{5-x}{2} \quad 3 < x \leq 5$$

$$= 0 \quad \text{otherwise}$$

- c)**
- Solve the Assignment Problem

Machine

| Job | A  | B  | C  | D  |
|-----|----|----|----|----|
| 1   | 18 | 24 | 28 | 32 |
| 2   | 8  | 13 | 17 | 19 |
| 3   | 10 | 15 | 19 | 22 |

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 1 of 12

- 8) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.
- |                  |                |
|------------------|----------------|
| a) under fitting | b) overfitting |
| c) cost function | d) none        |
- 9) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text.
- |                |                                |
|----------------|--------------------------------|
| a) Data mining | b) Natural Language Processing |
| c) Statistics  | d) None                        |
- 10) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_\_.
- |                        |                   |
|------------------------|-------------------|
| a) mini-batch learning | b) learning model |
| c) linear regression   | d) None           |
- 11) \_\_\_\_\_ function performs the rendering and uses a grayscale color map.
- |               |             |
|---------------|-------------|
| a) plt.show() | b) show()   |
| c) imshow()   | d) imread() |
- 12) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
- |                  |                 |
|------------------|-----------------|
| a) connectionism | b) neuron       |
| c) deep learning | d) all of above |
- 13) \_\_\_\_\_ Model looks into the future analysis of data.
- |                |                  |
|----------------|------------------|
| a) Descriptive | b) Predictive    |
| c) Business    | d) None of above |
- 14) \_\_\_\_\_ method is used to avoid over fitting.
- |                                |                   |
|--------------------------------|-------------------|
| a) Bayesian                    | b) Regularization |
| c) Rule based machine learning | d) None           |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Make suitable assumptions (if necessary and state them clearly)  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**  
 a) Explain tying machine learning methods to outcome.  
 b) Define machine learning. Explain Lear verging the power of machine learning.  
 c) Write the differences between supervised and unsupervised learning.  
 d) Explain the application of machine learning.  
 e) Explain the term reinforcement learning.
- Q.3 Answer the following questions. (Any One) 06**  
 a) Explain learning as optimization.  
 b) How to determine the best learning model explain it?
- Q.4 What is cost function explain its different types? 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**  
 a) Write short note on Searching for the best hyper parameters.  
 b) Write a short note on applying feature engineering.  
 c) Explain the term variance.  
 d) Explain the descending error curve.  
 e) Explain the stacking model.
- Q.6 Answer the following questions. (Any One) 06**  
 a) Write short note on underfitting and overfitting.  
 b) Explain the discovering the Incredible perceptron.
- Q.7 Explain the use of cross validation. 06**

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- 9) \_\_\_\_\_ is focused on primarily on making inferences and understanding the characteristics of the variable.
- a) Data mining
  - b) Statistics
  - c) Artificial Intelligence
  - d) All
- 10) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
- a) scipy
  - b) numpy
  - c) none
  - d) sklearn
- 11) \_\_\_\_\_ ways improves machine learning model.
- a) error curve method
  - b) testing multiple model
  - c) SDLC Model
  - d) none
- 12) \_\_\_\_\_ Technique is used to group similar types of objects with similar parameter.
- a) Bayesian
  - b) Clustering
  - c) Association
  - d) None
- 13) Which of the following steps are required to apply machine learning technique to support business strategy?
- a) What is the business problem you are trying to solve
  - b) When are the hidden data resources that you can take advantage
  - c) How can you prepare to get your data
  - d) all
- 14) No matter what the information is, for a machine learning algorithm to correctly process it, it should always be transformed into a \_\_\_\_\_.
- a) number
  - b) text
  - c) images
  - d) all of above



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ function performs the rendering and uses a grayscale color map.
 

|               |             |
|---------------|-------------|
| a) plt.show() | b) show()   |
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|                  |                 |
|------------------|-----------------|
| a) connectionism | b) neuron       |
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- 3) \_\_\_\_\_ Model looks into the future analysis of data.
 

|                |                  |
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| a) Descriptive | b) Predictive    |
| c) Business    | d) None of above |
- 4) \_\_\_\_\_ method is used to avoid over fitting.
 

|                                |                   |
|--------------------------------|-------------------|
| a) Bayesian                    | b) Regularization |
| c) Rule based machine learning | d) None           |
- 5) Quantitative features are perfect for machine learning because they define values as \_\_\_\_\_.
 

|           |                 |
|-----------|-----------------|
| a) number | b) text         |
| c) images | d) all of above |
- 6) \_\_\_\_\_ is focused on primarily on making inferences and understanding the characteristics of the variable.
 

|                            |               |
|----------------------------|---------------|
| a) Data mining             | b) Statistics |
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- 7) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
 

|          |            |
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|                       |                           |
|-----------------------|---------------------------|
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  - d) None

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| Seat No. |  |
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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Make suitable assumptions (if necessary and state them clearly)  
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**Section – I**

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- Q.3 Answer the following questions. (Any One) 06**  
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- Q.4 What is cost function explain its different types? 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**  
 a) Write short note on Searching for the best hyper parameters.  
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 c) Explain the term variance.  
 d) Explain the descending error curve.  
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- Q.6 Answer the following questions. (Any One) 06**  
 a) Write short note on underfitting and overfitting.  
 b) Explain the discovering the Incredible perceptron.
- Q.7 Explain the use of cross validation. 06**

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following steps are required to apply machine learning technique to support business strategy?
  - a) What is the business problem you are trying to solve
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- 2) No matter what the information is, for a machine learning algorithm to correctly process it, it should always be transformed into a \_\_\_\_\_.
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  - b) text
  - c) images
  - d) all of above
- 3) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.
  - a) under fitting
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- 4) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text.
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  - c) Statistics
  - d) None
- 5) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_\_.
  - a) mini-batch learning
  - b) learning model
  - c) linear regression
  - d) None
- 6) \_\_\_\_\_ function performs the rendering and uses a grayscale color map.
  - a) plt.show()
  - b) show()
  - c) imshow()
  - d) imread()
- 7) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
  - a) connectionism
  - b) neuron
  - c) deep learning
  - d) all of above

- 8) \_\_\_\_\_ Model looks into the future analysis of data.

|                |                  |
|----------------|------------------|
| a) Descriptive | b) Predictive    |
| c) Business    | d) None of above |
- 9) \_\_\_\_\_ method is used to avoid over fitting.

|                                |                   |
|--------------------------------|-------------------|
| a) Bayesian                    | b) Regularization |
| c) Rule based machine learning | d) None           |
- 10) Quantitative features are perfect for machine learning because they define values as \_\_\_\_\_.

|           |                 |
|-----------|-----------------|
| a) number | b) text         |
| c) images | d) all of above |
- 11) \_\_\_\_\_ is focused on primarily on making inferences and understanding the characteristics of the variable.

|                            |               |
|----------------------------|---------------|
| a) Data mining             | b) Statistics |
| c) Artificial Intelligence | d) All        |
- 12) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.

|          |            |
|----------|------------|
| a) scipy | b) numpy   |
| c) none  | d) sklearn |
- 13) \_\_\_\_\_ ways improves machine learning model.

|                       |                           |
|-----------------------|---------------------------|
| a) error curve method | b) testing multiple model |
| c) SDLC Model         | d) none                   |
- 14) \_\_\_\_\_ Technique is used to group similar types of objects with similar parameter.

|                |               |
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| a) Bayesian    | b) Clustering |
| c) Association | d) None       |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Make suitable assumptions (if necessary and state them clearly)  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**  
 a) Explain tying machine learning methods to outcome.  
 b) Define machine learning. Explain Lear verging the power of machine learning.  
 c) Write the differences between supervised and unsupervised learning.  
 d) Explain the application of machine learning.  
 e) Explain the term reinforcement learning.
- Q.3 Answer the following questions. (Any One) 06**  
 a) Explain learning as optimization.  
 b) How to determine the best learning model explain it?
- Q.4 What is cost function explain its different types? 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**  
 a) Write short note on Searching for the best hyper parameters.  
 b) Write a short note on applying feature engineering.  
 c) Explain the term variance.  
 d) Explain the descending error curve.  
 e) Explain the stacking model.
- Q.6 Answer the following questions. (Any One) 06**  
 a) Write short note on underfitting and overfitting.  
 b) Explain the discovering the Incredible perceptron.
- Q.7 Explain the use of cross validation. 06**

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Set **P**

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Mathematics for Data Science**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no. 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Among the following, choose the correct application of data science in Healthcare.
  - a) Data science for genomics
  - b) Data science for medical imaging
  - c) Drug discovery with Data science
  - d) All of the above
- 2) What is the first step in linear algebra?
  - a) Let's complicate the problem
  - b) Solve the problem
  - c) Visualize the problem
  - d) None of the above
- 3) The concept of Eigen values and vectors is applicable to \_\_\_\_\_.
  - a) Scalar matrix
  - b) Identity matrix
  - c) Upper triangular matrix
  - d) Square matrix
- 4) Simpson's rule assumes that boundary between the ordinates are parabolic arcs.
  - a) True
  - b) False
- 5) Find the mode and median of the 9 consecutive number: 12, 7, 8, 14, 21, 23, 27, 7, 11
  - a) 12, 9
  - b) 7, 9
  - c) 7, 12
  - d) 11, 9
- 6) Which of the following is correct application for Eigenvectors?
  - a) Computer vision
  - b) Physics
  - c) Machine learning
  - d) All of the above
- 7) The correlation coefficient is \_\_\_\_\_.
  - a) The square of the coefficient of determination
  - b) Can never be negative
  - c) The square root of the coefficient of determination
  - d) The same as r square



- 8) Normal Distribution is applied for \_\_\_\_\_.  
a) Continuous Random Distribution  
b) Discrete Random Variable  
c) Irregular Random Variable  
d) Uncertain Random Variable
- 9) What does the central limit theorem state?  
a) if the sample size increases sampling distribution must approach normal distribution  
b) if the sample size decreases then the sample distribution must approach normal distribution  
c) if the sample size increases then the sampling distribution much approach an exponential distribution  
d) if the sample size decreases then the sampling distribution much approach an exponential distribution
- 10) The probability of rejecting a true hypothesis is called \_\_\_\_\_.  
a) Critical region  
b) Level of significance  
c) Test statistics  
d) Statement of hypothesis
- 11) A statistic on the basis of which a decision is made about the hypothesis of interest is called \_\_\_\_\_.  
a) Test statistics  
b) Significance level  
c) Statement of hypothesis  
d) Critical region
- 12) The parameter E which we use for least square method is called as \_\_\_\_\_.  
a) Sum of residues  
b) Residues  
c) Error  
d) Sum of errors
- 13) \_\_\_\_\_ processes all the training examples for each iteration of gradient descent.  
a) Stochastic Gradient Descent  
b) Batch Gradient Descent  
c) Mini Batch gradient descent  
d) None of the above
- 14) What is the full form of KKT?  
a) Kret Kuhn Tacker  
b) Karush Kuhn Tucker  
c) Karush Kuhn Tacker  
d) None of these

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P

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Mathematics for Data Science**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Three) 12**
- What is Data Science?
  - Consider the ages of five employees as 30, 30, 32, 38, 60 years. Calculate the measures of central tendency.
  - Explain the term hyper planes and half-planes.
  - What is central tendencies?
- Q.3 Answer the following questions. (Any Two) 16**
- Explain Data Science Life Cycle.
  - Explain in detail Distance measures types in data science.
  - What are Eigen values & Eigenvectors?

**Section – II**

- Q.4 Answer the following questions. (Any Three) 12**
- The mean age of people in a colony is 34 years. Suppose the standard deviation is 15 years. The sample of size is 50. Find the mean and standard deviation of the sample.
  - What Is Hypothesis Testing in Statistics?
  - What is KKT condition? Explain in short.
  - What is the Least Squares Method?
- Q.5 Answer the following questions. (Any Two) 16**
- A fair die is rolled, Let A be the event that shows an outcome is an odd number, so  $A = \{1, 3, 5\}$ . Also, suppose B the event that shows the outcome is less than or equal to 3, so  $B = \{1, 2, 3\}$ . Then what is the probability of A,  $P(A)$ , and what is the probability A given B,  $P(A | B)$ ?
  - Explain in detail Statistical Hypothesis Testing. What is P-value?
  - What is gradient descent? How does gradient descent work? Explain with its types.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Mathematics for Data Science**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no. 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Normal Distribution is applied for \_\_\_\_\_.  
 a) Continuous Random Distribution  
 b) Discrete Random Variable  
 c) Irregular Random Variable  
 d) Uncertain Random Variable
- 2) What does the central limit theorem state?  
 a) if the sample size increases sampling distribution must approach normal distribution  
 b) if the sample size decreases then the sample distribution must approach normal distribution  
 c) if the sample size increases then the sampling distribution much approach an exponential distribution  
 d) if the sample size decreases then the sampling distribution much approach an exponential distribution
- 3) The probability of rejecting a true hypothesis is called \_\_\_\_\_.  
 a) Critical region  
 b) Level of significance  
 c) Test statistics  
 d) Statement of hypothesis
- 4) A statistic on the basis of which a decision is made about the hypothesis of interest is called \_\_\_\_\_.  
 a) Test statistics  
 b) Significance level  
 c) Statement of hypothesis  
 d) Critical region
- 5) The parameter E which we use for least square method is called as \_\_\_\_\_.  
 a) Sum of residues  
 b) Residues  
 c) Error  
 d) Sum of errors
- 6) \_\_\_\_\_ processes all the training examples for each iteration of gradient descent.  
 a) Stochastic Gradient Descent  
 b) Batch Gradient Descent  
 c) Mini Batch gradient descent  
 d) None of the above



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Mathematics for Data Science**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Three) 12**
- What is Data Science?
  - Consider the ages of five employees as 30, 30, 32, 38, 60 years. Calculate the measures of central tendency.
  - Explain the term hyper planes and half-planes.
  - What is central tendencies?
- Q.3 Answer the following questions. (Any Two) 16**
- Explain Data Science Life Cycle.
  - Explain in detail Distance measures types in data science.
  - What are Eigen values & Eigenvectors?

**Section – II**

- Q.4 Answer the following questions. (Any Three) 12**
- The mean age of people in a colony is 34 years. Suppose the standard deviation is 15 years. The sample of size is 50. Find the mean and standard deviation of the sample.
  - What Is Hypothesis Testing in Statistics?
  - What is KKT condition? Explain in short.
  - What is the Least Squares Method?
- Q.5 Answer the following questions. (Any Two) 16**
- A fair die is rolled, Let A be the event that shows an outcome is an odd number, so  $A = \{1, 3, 5\}$ . Also, suppose B the event that shows the outcome is less than or equal to 3, so  $B = \{1, 2, 3\}$ . Then what is the probability of A,  $P(A)$ , and what is the probability A given B,  $P(A | B)$ ?
  - Explain in detail Statistical Hypothesis Testing. What is P-value?
  - What is gradient descent? How does gradient descent work? Explain with its types.

**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Mathematics for Data Science**

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no. 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks: 14

14

- 1) A statistic on the basis of which a decision is made about the hypothesis of interest is called \_\_\_\_\_.  
a) Test statistics                      b) Significance level  
c) Statement of hypothesis          d) Critical region
- 2) The parameter E which we use for least square method is called as \_\_\_\_\_.  
a) Sum of residues                      b) Residues  
c) Error                                    d) Sum of errors
- 3) \_\_\_\_\_ processes all the training examples for each iteration of gradient descent.  
a) Stochastic Gradient Descent      b) Batch Gradient Descent  
c) Mini Batch gradient descent       d) None of the above
- 4) What is the full form of KKT?  
a) Kret Kuhn Tacker                      b) Karush Kuhn Tucker  
c) Karush Kuhn Tacker                  d) None of these
- 5) Among the following, choose the correct application of data science in Healthcare.  
a) Data science for genomics  
b) Data science for medical imaging  
c) Drug discovery with Data science  
d) All of the above
- 6) What is the first step in linear algebra?  
a) Let's complicate the problem      b) Solve the problem  
c) Visualize the problem                d) None of the above
- 7) The concept of Eigen values and vectors is applicable to \_\_\_\_\_.  
a) Scalar matrix                          b) Identity matrix  
c) Upper triangular matrix              d) Square matrix
- 8) Simpson's rule assumes that boundary between the ordinates are parabolic arcs.  
a) True                                        b) False

- 9) Find the mode and median of the 9 consecutive number:  
12, 7, 8, 14, 21, 23, 27, 7, 11
- |          |          |
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| a) 12, 9 | b) 7, 9  |
| c) 7, 12 | d) 11, 9 |
- 10) Which of the following is correct application for Eigenvectors?
- |                     |                     |
|---------------------|---------------------|
| a) Computer vision  | b) Physics          |
| c) Machine learning | d) All of the above |
- 11) The correlation coefficient is \_\_\_\_\_
- a) The square of the coefficient of determination
  - b) Can never be negative
  - c) The square root of the coefficient of determination
  - d) The same as r square
- 12) Normal Distribution is applied for \_\_\_\_\_.
- a) Continuous Random Distribution
  - b) Discrete Random Variable
  - c) Irregular Random Variable
  - d) Uncertain Random Variable
- 13) What does the central limit theorem state?
- a) if the sample size increases sampling distribution must approach normal distribution
  - b) if the sample size decreases then the sample distribution must approach normal distribution
  - c) if the sample size increases then the sampling distribution much approach an exponential distribution
  - d) if the sample size decreases then the sampling distribution much approach an exponential distribution
- 14) The probability of rejecting a true hypothesis is called \_\_\_\_\_.
- |                    |                            |
|--------------------|----------------------------|
| a) Critical region | b) Level of significance   |
| c) Test statistics | d) Statement of hypothesis |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Mathematics for Data Science**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Three) 12**
- What is Data Science?
  - Consider the ages of five employees as 30, 30, 32, 38, 60 years. Calculate the measures of central tendency.
  - Explain the term hyper planes and half-planes.
  - What is central tendencies?
- Q.3 Answer the following questions. (Any Two) 16**
- Explain Data Science Life Cycle.
  - Explain in detail Distance measures types in data science.
  - What are Eigen values & Eigenvectors?

**Section – II**

- Q.4 Answer the following questions. (Any Three) 12**
- The mean age of people in a colony is 34 years. Suppose the standard deviation is 15 years. The sample of size is 50. Find the mean and standard deviation of the sample.
  - What Is Hypothesis Testing in Statistics?
  - What is KKT condition? Explain in short.
  - What is the Least Squares Method?
- Q.5 Answer the following questions. (Any Two) 16**
- A fair die is rolled, Let A be the event that shows an outcome is an odd number, so  $A = \{1, 3, 5\}$ . Also, suppose B the event that shows the outcome is less than or equal to 3, so  $B = \{1, 2, 3\}$ . Then what is the probability of A,  $P(A)$ , and what is the probability A given B,  $P(A | B)$ ?
  - Explain in detail Statistical Hypothesis Testing. What is P-value?
  - What is gradient descent? How does gradient descent work? Explain with its types.



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Mathematics for Data Science**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no. 03 (Starting page of the Answer Book). Each Question carries one mark.  
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 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is correct application for Eigenvectors?
  - a) Computer vision
  - b) Physics
  - c) Machine learning
  - d) All of the above
- 2) The correlation coefficient is \_\_\_\_\_.
  - a) The square of the coefficient of determination
  - b) Can never be negative
  - c) The square root of the coefficient of determination
  - d) The same as r square
- 3) Normal Distribution is applied for \_\_\_\_\_.
  - a) Continuous Random Distribution
  - b) Discrete Random Variable
  - c) Irregular Random Variable
  - d) Uncertain Random Variable
- 4) What does the central limit theorem state?
  - a) if the sample size increases sampling distribution must approach normal distribution
  - b) if the sample size decreases then the sample distribution must approach normal distribution
  - c) if the sample size increases then the sampling distribution much approach an exponential distribution
  - d) if the sample size decreases then the sampling distribution much approach an exponential distribution
- 5) The probability of rejecting a true hypothesis is called \_\_\_\_\_.
  - a) Critical region
  - b) Level of significance
  - c) Test statistics
  - d) Statement of hypothesis
- 6) A statistic on the basis of which a decision is made about the hypothesis of interest is called \_\_\_\_\_.
  - a) Test statistics
  - b) Significance level
  - c) Statement of hypothesis
  - d) Critical region

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Mathematics for Data Science**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Three) 12**
- What is Data Science?
  - Consider the ages of five employees as 30, 30, 32, 38, 60 years. Calculate the measures of central tendency.
  - Explain the term hyper planes and half-planes.
  - What is central tendencies?
- Q.3 Answer the following questions. (Any Two) 16**
- Explain Data Science Life Cycle.
  - Explain in detail Distance measures types in data science.
  - What are Eigen values & Eigenvectors?

**Section – II**

- Q.4 Answer the following questions. (Any Three) 12**
- The mean age of people in a colony is 34 years. Suppose the standard deviation is 15 years. The sample of size is 50. Find the mean and standard deviation of the sample.
  - What Is Hypothesis Testing in Statistics?
  - What is KKT condition? Explain in short.
  - What is the Least Squares Method?
- Q.5 Answer the following questions. (Any Two) 16**
- A fair die is rolled, Let A be the event that shows an outcome is an odd number, so  $A = \{1, 3, 5\}$ . Also, suppose B the event that shows the outcome is less than or equal to 3, so  $B = \{1, 2, 3\}$ . Then what is the probability of A,  $P(A)$ , and what is the probability A given B,  $P(A | B)$ ?
  - Explain in detail Statistical Hypothesis Testing. What is P-value?
  - What is gradient descent? How does gradient descent work? Explain with its types.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The \_\_\_\_\_ is the message after transformation.
  - a) Plaintext
  - b) Secret-text
  - c) Ciphertext
  - d) None of the above
- 2) The keys used in cryptography are \_\_\_\_\_.
  - a) Private Key
  - b) Public Key
  - c) Secret Key
  - d) All of the above
- 3) In symmetric-key cryptography, the key locks and unlocks the box is \_\_\_\_\_.
  - a) Shared
  - b) Same
  - c) Private
  - d) Public
- 4) In asymmetric key cryptography, the private key is kept by \_\_\_\_\_.
  - a) sender
  - b) receiver
  - c) sender and receiver
  - d) all the connected devices to the network
- 5) Caesar Cipher is an example of \_\_\_\_\_.
  - a) Poly-alphabetic Cipher
  - b) Mono-alphabetic Cipher
  - c) Multi-alphabetic Cipher
  - d) Bi-alphabetic Cipher
- 6) The DES algorithm has a key length of \_\_\_\_\_.
  - a) 128 Bits
  - b) 32 Bits
  - c) 64 Bits
  - d) 16 Bits
- 7) AES stands for Advanced Encryption Standard.
  - a) True
  - b) False
- 8) RSA algorithm is \_\_\_\_\_ cryptography algorithm.
  - a) Systematic
  - b) Symmetric
  - c) Asymmetric
  - d) None of the mentioned above
- 9) Which of the following modes of operation in DES is used for operating?
  - a) Cipher Feedback Mode (CFB)
  - b) Cipher Block chaining (CBC)
  - c) Electronic code book (ECB)
  - d) Output Feedback Modes (OFB)

- 10) Which of the following is /are offered by the Hash functions?
  - a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above
- 11) A cryptographic hash function is an equation used to verify the \_\_\_\_\_ of data.
  - a) Variety
  - b) Validity
  - c) Veracity
  - d) None of the mentioned above
- 12) MAC is a \_\_\_\_\_.
  - a) one-to-one mapping
  - b) many-to-one mapping
  - c) onto mapping
  - d) None of the mentioned
- 13) What are the common security threats?
  - a) File Shredding
  - b) File sharing and permission
  - c) File corrupting
  - d) File integrity
- 14) A cryptosystem is also termed as \_\_\_\_\_.
  - a) secure system
  - b) cipher system
  - c) cipher-text
  - d) secure algorithm

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cryptography**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Explain the model of network security with diagram.
  - Explain in detail security attacks.
  - Explain Caesar cipher with example.
  - What is difference between monoalphabetic cipher and polyalphabetic cipher?
  - Explain block cipher and stream cipher with diagram.
- Q.3 Answer the following questions. (Any Two) 12**
- Explain the working of DES with diagram.
  - Explain Security services in details.
  - Explain in detail symmetric cipher model with diagram.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- Write application of public key cryptosystem.
  - Explain encryption with public key with diagram.
  - Write hash functions based on using a cipher block chaining technique.
  - Explain Kerberos in details.
  - Write a note on Simplified Depiction of Essential Elements of Digital Signature Process.
- Q.5 Answer the following questions. (Any Two) 12**
- What is MAC? Explain three basic uses of Message authentication code.
  - Explain PIV System Model with diagram.
  - Explain Man-in-the-Middle Attack.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) RSA algorithm is \_\_\_\_\_ cryptography algorithm.
  - a) Systematic
  - b) Symmetric
  - c) Asymmetric
  - d) None of the mentioned above
- 2) Which of the following modes of operation in DES is used for operating?
  - a) Cipher Feedback Mode (CFB)
  - b) Cipher Block chaining (CBC)
  - c) Electronic code book (ECB)
  - d) Output Feedback Modes (OFB)
- 3) Which of the following is /are offered by the Hash functions?
  - a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above
- 4) A cryptographic hash function is an equation used to verify the \_\_\_\_\_ of data.
  - a) Variety
  - b) Validity
  - c) Veracity
  - d) None of the mentioned above
- 5) MAC is a \_\_\_\_\_.
  - a) one-to-one mapping
  - b) many-to-one mapping
  - c) onto mapping
  - d) None of the mentioned
- 6) What are the common security threats?
  - a) File Shredding
  - b) File sharing and permission
  - c) File corrupting
  - d) File integrity
- 7) A cryptosystem is also termed as \_\_\_\_\_.
  - a) secure system
  - b) cipher system
  - c) cipher-text
  - d) secure algorithm
- 8) The \_\_\_\_\_ is the message after transformation.
  - a) Plaintext
  - b) Secret-text
  - c) Ciphertext
  - d) None of the above
- 9) The keys used in cryptography are \_\_\_\_\_.
  - a) Private Key
  - b) Public Key
  - c) Secret Key
  - d) All of the above

- 10) In symmetric-key cryptography, the key locks and unlocks the box is \_\_\_\_\_.
  - a) Shared
  - b) Same
  - c) Private
  - d) Public
- 11) In asymmetric key cryptography, the private key is kept by \_\_\_\_\_.
  - a) sender
  - b) receiver
  - c) sender and receiver
  - d) all the connected devices to the network
- 12) Caesar Cipher is an example of \_\_\_\_\_.
  - a) Poly-alphabetic Cipher
  - b) Mono-alphabetic Cipher
  - c) Multi-alphabetic Cipher
  - d) Bi-alphabetic Cipher
- 13) The DES algorithm has a key length of \_\_\_\_\_.
  - a) 128 Bits
  - b) 32 Bits
  - c) 64 Bits
  - d) 16 Bits
- 14) AES stands for Advanced Encryption Standard.
  - a) True
  - b) False



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.  
3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- a) Explain the model of network security with diagram.
  - b) Explain in detail security attacks.
  - c) Explain Caesar cipher with example.
  - d) What is difference between monoalphabetic cipher and polyalphabetic cipher?
  - e) Explain block cipher and stream cipher with diagram.
- Q.3 Answer the following questions. (Any Two) 12**
- a) Explain the working of DES with diagram.
  - b) Explain Security services in details.
  - c) Explain in detail symmetric cipher model with diagram.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- a) Write application of public key cryptosystem.
  - b) Explain encryption with public key with diagram.
  - c) Write hash functions based on using a cipher block chaining technique.
  - d) Explain Kerberos in details.
  - e) Write a note on Simplified Depiction of Essential Elements of Digital Signature Process.
- Q.5 Answer the following questions. (Any Two) 12**
- a) What is MAC? Explain three basic uses of Message authentication code.
  - b) Explain PIV System Model with diagram.
  - c) Explain Man-in-the-Middle Attack.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A cryptographic hash function is an equation used to verify the \_\_\_\_\_ of data.
  - a) Variety
  - b) Validity
  - c) Veracity
  - d) None of the mentioned above
- 2) MAC is a \_\_\_\_\_.
  - a) one-to-one mapping
  - b) many-to-one mapping
  - c) onto mapping
  - d) None of the mentioned
- 3) What are the common security threats?
  - a) File Shredding
  - b) File sharing and permission
  - c) File corrupting
  - d) File integrity
- 4) A cryptosystem is also termed as \_\_\_\_\_.
  - a) secure system
  - b) cipher system
  - c) cipher-text
  - d) secure algorithm
- 5) The \_\_\_\_\_ is the message after transformation.
  - a) Plaintext
  - b) Secret-text
  - c) Ciphertext
  - d) None of the above
- 6) The keys used in cryptography are \_\_\_\_\_.
  - a) Private Key
  - b) Public Key
  - c) Secret Key
  - d) All of the above
- 7) In symmetric-key cryptography, the key locks and unlocks the box is \_\_\_\_\_.
  - a) Shared
  - b) Same
  - c) Private
  - d) Public
- 8) In asymmetric key cryptography, the private key is kept by \_\_\_\_\_.
  - a) sender
  - b) receiver
  - c) sender and receiver
  - d) all the connected devices to the network
- 9) Caesar Cipher is an example of \_\_\_\_\_.
  - a) Poly-alphabetic Cipher
  - b) Mono-alphabetic Cipher
  - c) Multi-alphabetic Cipher
  - d) Bi-alphabetic Cipher

- 10) The DES algorithm has a key length of \_\_\_\_\_.
  - a) 128 Bits
  - b) 32 Bits
  - c) 64 Bits
  - d) 16 Bits
- 11) AES stands for Advanced Encryption Standard.
  - a) True
  - b) False
- 12) RSA algorithm is \_\_\_\_\_ cryptography algorithm.
  - a) Systematic
  - b) Symmetric
  - c) Asymmetric
  - d) None of the mentioned above
- 13) Which of the following modes of operation in DES is used for operating?
  - a) Cipher Feedback Mode (CFB)
  - b) Cipher Block chaining (CBC)
  - c) Electronic code book (ECB)
  - d) Output Feedback Modes (OFB)
- 14) Which of the following is /are offered by the Hash functions?
  - a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cryptography**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Explain the model of network security with diagram.
  - Explain in detail security attacks.
  - Explain Caesar cipher with example.
  - What is difference between monoalphabetic cipher and polyalphabetic cipher?
  - Explain block cipher and stream cipher with diagram.
- Q.3 Answer the following questions. (Any Two) 12**
- Explain the working of DES with diagram.
  - Explain Security services in details.
  - Explain in detail symmetric cipher model with diagram.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- Write application of public key cryptosystem.
  - Explain encryption with public key with diagram.
  - Write hash functions based on using a cipher block chaining technique.
  - Explain Kerberos in details.
  - Write a note on Simplified Depiction of Essential Elements of Digital Signature Process.
- Q.5 Answer the following questions. (Any Two) 12**
- What is MAC? Explain three basic uses of Message authentication code.
  - Explain PIV System Model with diagram.
  - Explain Man-in-the-Middle Attack.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The DES algorithm has a key length of \_\_\_\_\_.  
a) 128 Bits                                      b) 32 Bits  
c) 64 Bits                                        d) 16 Bits
- 2) AES stands for Advanced Encryption Standard.  
a) True                                              b) False
- 3) RSA algorithm is \_\_\_\_\_ cryptography algorithm.  
a) Systematic                                      b) Symmetric  
c) Asymmetric                                    d) None of the mentioned above
- 4) Which of the following modes of operation in DES is used for operating?  
a) Cipher Feedback Mode (CFB)  
b) Cipher Block chaining (CBC)  
c) Electronic code book (ECB)  
d) Output Feedback Modes (OFB)
- 5) Which of the following is /are offered by the Hash functions?  
a) Authentication                                  b) Non repudiation  
c) Data Integrity                                   d) All of the above
- 6) A cryptographic hash function is an equation used to verify the \_\_\_\_\_ of data.  
a) Variety                                            b) Validity  
c) Veracity                                          d) None of the mentioned above
- 7) MAC is a \_\_\_\_\_.  
a) one-to-one mapping                              b) many-to-one mapping  
c) onto mapping                                      d) None of the mentioned
- 8) What are the common security threats?  
a) File Shredding                                   b) File sharing and permission  
c) File corrupting                                   d) File integrity

- 9) A cryptosystem is also termed as \_\_\_\_\_.  
a) secure system                      b) cipher system  
c) cipher-text                         d) secure algorithm
- 10) The \_\_\_\_\_ is the message after transformation.  
a) Plaintext                            b) Secret-text  
c) Ciphertext                          d) None of the above
- 11) The keys used in cryptography are \_\_\_\_\_.  
a) Private Key                         b) Public Key  
c) Secret Key                          d) All of the above
- 12) In symmetric-key cryptography, the key locks and unlocks the box is \_\_\_\_\_.  
a) Shared                                b) Same  
c) Private                                d) Public
- 13) In asymmetric key cryptography, the private key is kept by \_\_\_\_\_.  
a) sender  
b) receiver  
c) sender and receiver  
d) all the connected devices to the network
- 14) Caesar Cipher is an example of \_\_\_\_\_.  
a) Poly-alphabetic Cipher            b) Mono-alphabetic Cipher  
c) Multi-alphabetic Cipher          d) Bi-alphabetic Cipher

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Cryptography**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Explain the model of network security with diagram.
  - Explain in detail security attacks.
  - Explain Caesar cipher with example.
  - What is difference between monoalphabetic cipher and polyalphabetic cipher?
  - Explain block cipher and stream cipher with diagram.
- Q.3 Answer the following questions. (Any Two) 12**
- Explain the working of DES with diagram.
  - Explain Security services in details.
  - Explain in detail symmetric cipher model with diagram.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- Write application of public key cryptosystem.
  - Explain encryption with public key with diagram.
  - Write hash functions based on using a cipher block chaining technique.
  - Explain Kerberos in details.
  - Write a note on Simplified Depiction of Essential Elements of Digital Signature Process.
- Q.5 Answer the following questions. (Any Two) 12**
- What is MAC? Explain three basic uses of Message authentication code.
  - Explain PIV System Model with diagram.
  - Explain Man-in-the-Middle Attack.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 1 of 16



- 9) The push down automata indicate the acceptance of input string in terms of \_\_\_\_\_.  
a) Final state  
b) Empty stack  
c) Both (a) and (b)  
d) None of these
- 10) Which type of symbols contain in the stack of PDA?  
a) Variable  
b) Terminal  
c) Both (a) and (b)  
d) None of these
- 11) Inability of FA is \_\_\_\_\_.  
a) Writing  
b) Finite memory  
c) Sequential memory  
d) all a, b, and c
- 12) The symbol  $Z_0$  in formal definition of PDA is used for \_\_\_\_\_.  
a) Stack symbol  
b) Input symbol  
c) Both (a) and (b)  
d) None of these
- 13) A grammar  $G = (V, T, P, S)$  is \_\_\_\_\_ if every production taken one of the two forms:  
 $B \rightarrow aC$   
 $B \rightarrow a$   
a) Ambiguous  
b) Regular  
c) Non Regular  
d) None of the mentioned
- 14) Which of the following strings is not generated by the following grammar?  
 $S \rightarrow SaSbS|e$   
a) aabb  
b) abab  
c) aababb  
d) aaabb

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Set **P**

**S.Y. (B.Tech) (Sem – II) (Old) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

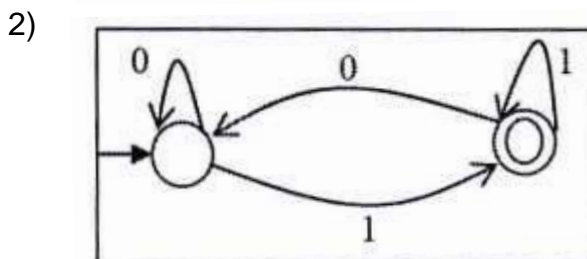
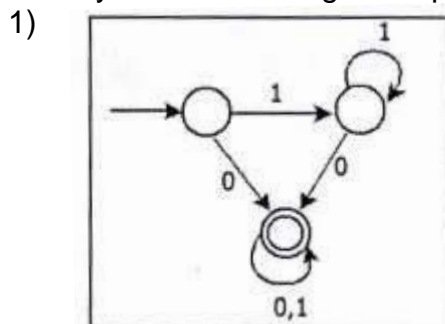
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any three**

**12**

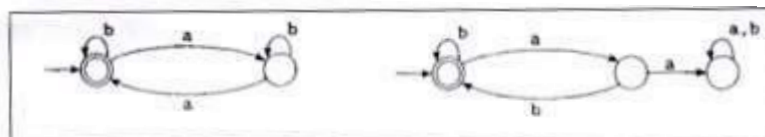
a) Identify the set of strings accepted by given following DFA.



b) Construct regular expression corresponding to each of the following subset of  $\{0, 1\}^*$

- The language of all strings containing exactly two 0's
- The language C identifiers.

c) Associate given M1 and M2 be the FAs are pictured for L1, L2 resp. to represent a machine accepting following language  $L1 \cup L2$ ,  $L1 - L2$



d) Write a context free grammar equivalent for  $(011+1)^*(01)^*$

**Q.3 Solve any One**

**08**

a) Convert the following grammar into Chomsky normal form

$S \rightarrow AACD$

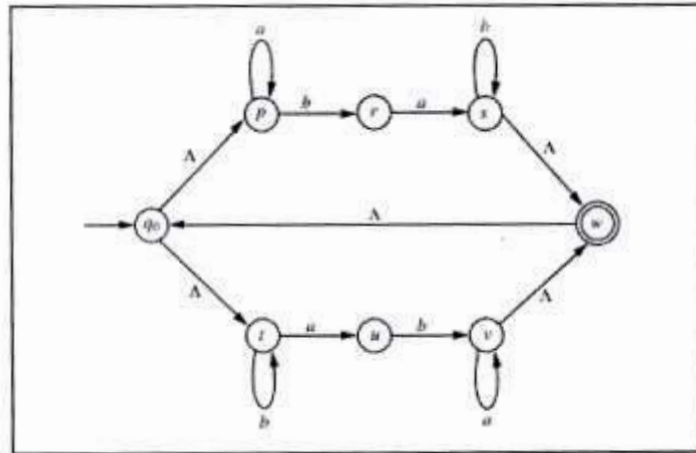
$A \rightarrow aAb|^{\wedge}$

$C \rightarrow aC|a$

$D \rightarrow aDa|bDb|^{\wedge}$

b) Check whether following string is accepted by given NFA-<sup>^</sup>

- 1) aa
- 2) bab
- 3) ab
- 4) abab



Q.4 Draw NFA-<sup>^</sup> for the following Regular expression

$$a^*b^*+(ba)^*$$

08

### Section – II

Q.5 Solve any three

12

- a) State and explain pumping lemma for CFL.
- b) What is PDA? Explain with an example.
- c) Obtain a TM to accept the language  
 $L = \{w | w \leftarrow (0 + 1)^* \text{ containing substring } 001\}$
- d) Show that  $L = \{a^n b^n | n \geq 1\}$  is not regular.

Q.6 Solve any One

08

- a) Obtain a PDA to accept the language  
 $L(M) = \{w | w \leftarrow (a + b)^* \text{ and } n_a(w) = n_b(w)\}$  by final state
- b) Explain Different types of variation in TM.

Q.7 State and explain the block diagram of TM and construct a TM to accept the language.

08

$$L(M) = \{a^n b^n c^n | n \geq 1\}$$

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No.**

Max. Marks: 70

Marks: 14

14

- Page 5 of 16

- 9) The language  $L = \{ a^n b^n a^n : n \geq 1 \}$  is recognized by \_\_\_\_\_.
  - a) TM
  - b) 2PDA
  - c) Post Machine
  - d) All of the above
- 10) The set of all strings over the alphabet  $S = \{a, b\}$  (including  $\epsilon$ ) is denoted by \_\_\_\_\_.
  - a)  $(a + b)^*$
  - b)  $(a + b) +$
  - c)  $a + b +$
  - d)  $a^* b^*$
- 11) UTM influenced the concept of \_\_\_\_\_.
  - a) Computability
  - b) Interpretive implementation of programming language
  - c) Program and data is in same memory
  - d) All of above
- 12) The entity which generate Language is termed as:
  - a) Automata
  - b) Tokens
  - c) Grammar
  - d) Data
- 13) There are \_\_\_\_\_ tuples in finite state machine.
  - a) 4
  - b) 5
  - c) 6
  - d) unlimited
- 14) PDA can be represented with the help of \_\_\_\_\_.
  - a) Instantaneous description
  - b) Transition diagram
  - c) Transition table
  - d) All of these

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Set **Q**

**S.Y. (B.Tech) (Sem – II) (Old) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

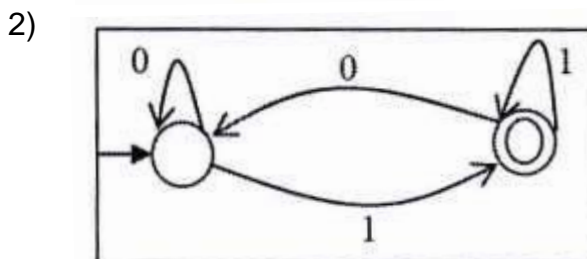
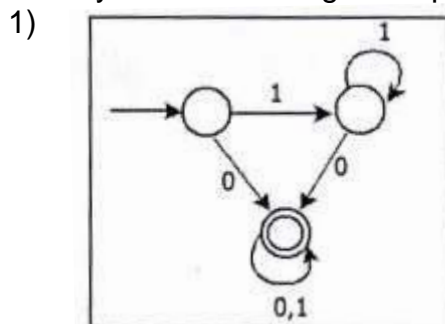
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any three**

**12**

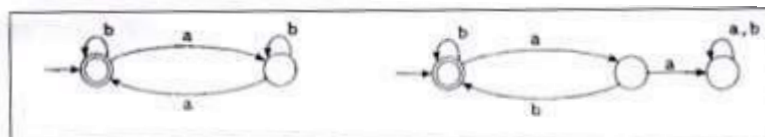
a) Identify the set of strings accepted by given following DFA.



b) Construct regular expression corresponding to each of the following subset of  $\{0, 1\}^*$

- The language of all strings containing exactly two 0's
- The language C identifiers.

c) Associate given M1 and M2 be the FAs are pictured for L1, L2 resp. to represent a machine accepting following language  $L1 \cup L2$ ,  $L1 - L2$



d) Write a context free grammar equivalent for  $(011+1)^*(01)^*$

**Q.3 Solve any One**

**08**

a) Convert the following grammar into Chomsky normal form

$S \rightarrow AACD$

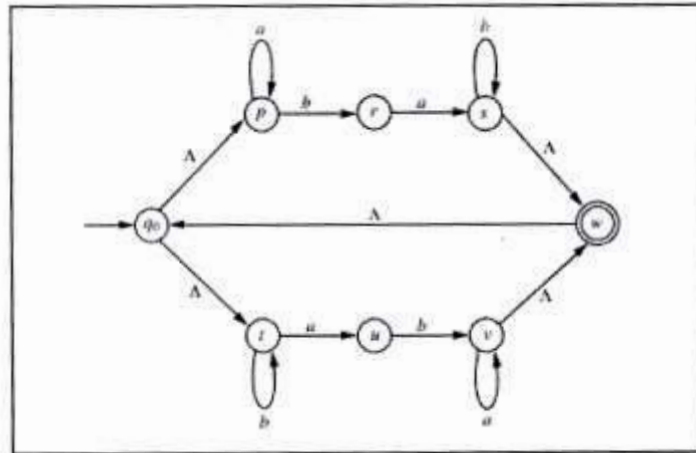
$A \rightarrow aAb|^{\wedge}$

$C \rightarrow aC|a$

$D \rightarrow aDa|bDb|^{\wedge}$

b) Check whether following string is accepted by given NFA-<sup>^</sup>

- 1) aa
- 2) bab
- 3) ab
- 4) abab



**Q.4** Draw NFA-<sup>^</sup> for the following Regular expression

$$a^*b^*+(ba)^*$$

**08**

### Section – II

**Q.5** Solve any three

**12**

- a) State and explain pumping lemma for CFL.
- b) What is PDA? Explain with an example.
- c) Obtain a TM to accept the language  
 $L = \{w | w \leftarrow (0 + 1)^* \text{ containing substring } 001\}$
- d) Show that  $L = \{a^n b^n | n \geq 1\}$  is not regular.

**Q.6** Solve any One

**08**

- a) Obtain a PDA to accept the language  
 $L(M) = \{w | w \leftarrow (a + b)^* \text{ and } n_a(w) = n_b(w)\}$  by final state
- b) Explain Different types of variation in TM.

**Q.7** State and explain the block diagram of TM and construct a TM to accept the language.

**08**

$$L(M) = \{a^n b^n c^n | n \geq 1\}$$

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Day & Date: Monday, 06-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

## Marks: 14

14

- Page 9 of 16



- 8) UTM influenced the concept of \_\_\_\_\_.  
a) Computability  
b) Interpretive implementation of programming language  
c) Program and data is in same memory  
d) All of above
- 9) The entity which generate Language is termed as:  
a) Automata  
b) Tokens  
c) Grammar  
d) Data
- 10) There are \_\_\_\_\_ tuples in finite state machine.  
a) 4  
b) 5  
c) 6  
d) unlimited
- 11) PDA can be represented with the help of \_\_\_\_\_.  
a) Instantaneous description  
b) Transition diagram  
c) Transition table  
d) All of these
- 12) A push down automata is different than finite automata by \_\_\_\_\_.  
a) Its memory (stack)  
b) Number of states  
c) Both (a) and (b)  
d) None of these
- 13) The push down automata indicate the acceptance of input string in terms of \_\_\_\_\_.  
a) Final state  
b) Empty stack  
c) Both (a) and (b)  
d) None of these
- 14) Which type of symbols contain in the stack of PDA?  
a) Variable  
b) Terminal  
c) Both (a) and (b)  
d) None of these

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Set **R**

**S.Y. (B.Tech) (Sem – II) (Old) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

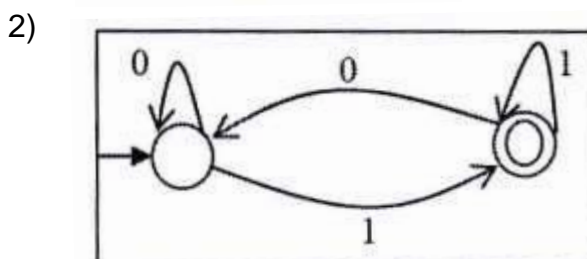
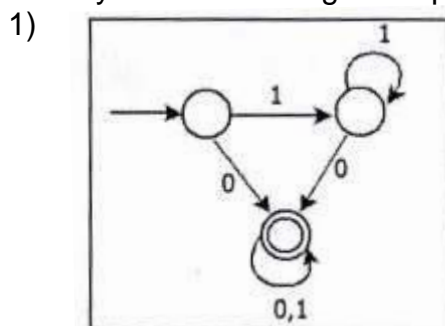
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any three**

**12**

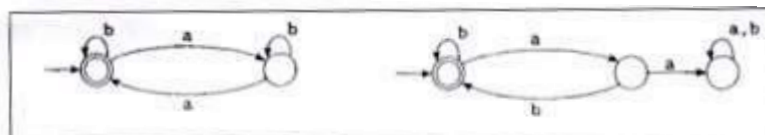
a) Identify the set of strings accepted by given following DFA.



b) Construct regular expression corresponding to each of the following subset of  $\{0, 1\}^*$

- The language of all strings containing exactly two 0's
- The language C identifiers.

c) Associate given M1 and M2 be the FAs are pictured for L1, L2 resp. to represent a machine accepting following language  $L1 \cup L2$ ,  $L1 - L2$



d) Write a context free grammar equivalent for  $(011+1)^*(01)^*$

**Q.3 Solve any One**

**08**

a) Convert the following grammar into Chomsky normal form

$S \rightarrow AACD$

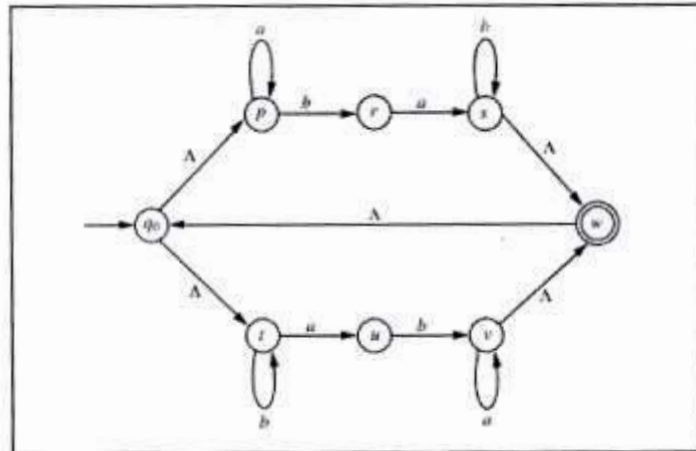
$A \rightarrow aAb|^{\wedge}$

$C \rightarrow aC|a$

$D \rightarrow aDa|bDb|^{\wedge}$

b) Check whether following string is accepted by given NFA-<sup>^</sup>

- 1) aa
- 2) bab
- 3) ab
- 4) abab



**Q.4** Draw NFA-<sup>^</sup> for the following Regular expression

$$a^*b^*(ba)^*$$

**08**

### Section – II

**Q.5 Solve any three**

**12**

- a) State and explain pumping lemma for CFL.
- b) What is PDA? Explain with an example.
- c) Obtain a TM to accept the language  
 $L = \{w | w \leftarrow (0 + 1)^* \text{ containing substring } 001\}$
- d) Show that  $L = \{a^n b^n | n \geq 1\}$  is not regular.

**Q.6 Solve any One**

**08**

- a) Obtain a PDA to accept the language  
 $L(M) = \{w | w \leftarrow (a + b)^* \text{ and } n_a(w) = n_b(w)\}$  by final state
- b) Explain Different types of variation in TM.

**Q.7** State and explain the block diagram of TM and construct a TM to accept the language.

**08**

$$L(M) = \{a^n b^n c^n | n \geq 1\}$$

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**S.Y. (B.Tech) (Sem – II) (Old) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) There are \_\_\_\_\_ tuples in finite state machine.
  - a) 4
  - b) 5
  - c) 6
  - d) unlimited
- 2) PDA can be represented with the help of \_\_\_\_\_.
  - a) Instantaneous description
  - b) Transition diagram
  - c) Transition table
  - d) All of these
- 3) A push down automata is different than finite automata by \_\_\_\_\_.
  - a) Its memory (stack)
  - b) Number of states
  - c) Both (a) and (b)
  - d) None of these
- 4) The push down automata indicate the acceptance of input string in terms of \_\_\_\_\_.
  - a) Final state
  - b) Empty stack
  - c) Both (a) and (b)
  - d) None of these
- 5) Which type of symbols contain in the stack of PDA?
  - a) Variable
  - b) Terminal
  - c) Both (a) and (b)
  - d) None of these
- 6) Inability of FA is \_\_\_\_\_.
  - a) Writing
  - b) Finite memory
  - c) Sequential memory
  - d) all a, b, and c
- 7) The symbol  $Z_0$  in formal definition of PDA is used for \_\_\_\_\_.
  - a) Stack symbol
  - b) Input symbol
  - c) Both (a) and (b)
  - d) None of these
- 8) A grammar  $G = (V, T, P, S)$  is \_\_\_\_\_ if every production taken one of the two forms:
 

$B \rightarrow aC$

$B \rightarrow a$

  - a) Ambiguous
  - b) Regular
  - c) Non Regular
  - d) None of the mentioned

- 9) Which of the following strings is not generated by the following grammar?  
 $S \rightarrow SaSbS|e$
- |           |          |
|-----------|----------|
| a) aabb   | b) abab  |
| c) aababb | d) aaabb |
- 10) A PDA behaves like a FSM when it has number of auxiliary memory \_\_\_\_.
- |              |                 |
|--------------|-----------------|
| a) 0         | b) Exactly 2    |
| c) 2 or more | d) Both a and b |
- 11) The language  $L = \{ a^n b^n a^n : n \geq 1 \}$  is recognized by \_\_\_\_.
- |                 |                     |
|-----------------|---------------------|
| a) TM           | b) 2PDA             |
| c) Post Machine | d) All of the above |
- 12) The set of all strings over the alphabet  $S = \{a, b\}$  (including  $\epsilon$ ) is denoted by \_\_\_\_.
- |                |                |
|----------------|----------------|
| a) $(a + b)^*$ | b) $(a + b) +$ |
| c) $a + b +$   | d) $a^*b^*$    |
- 13) UTM influenced the concept of \_\_\_\_.
- |                                                        |
|--------------------------------------------------------|
| a) Computability                                       |
| b) Interpretive implementation of programming language |
| c) Program and data is in same memory                  |
| d) All of above                                        |
- 14) The entity which generate Language is termed as:
- |             |           |
|-------------|-----------|
| a) Automata | b) Tokens |
| c) Grammar  | d) Data   |

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Set **S**

**S.Y. (B.Tech) (Sem – II) (Old) (CBSE) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

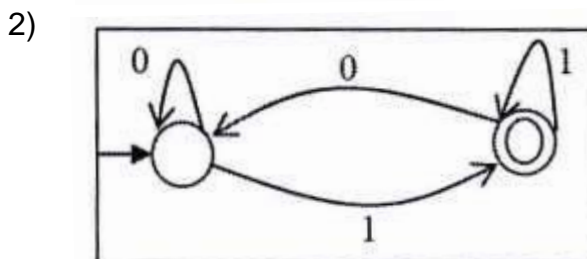
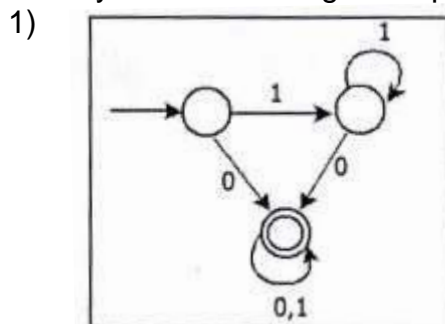
**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Solve any three**

**12**

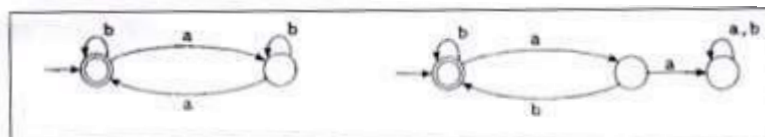
a) Identify the set of strings accepted by given following DFA.



b) Construct regular expression corresponding to each of the following subset of  $\{0, 1\}^*$

- The language of all strings containing exactly two 0's
- The language C identifiers.

c) Associate given M1 and M2 be the FAs are pictured for L1, L2 resp. to represent a machine accepting following language  $L1 \cup L2$ ,  $L1 - L2$



d) Write a context free grammar equivalent for  $(011+1)^*(01)^*$

**Q.3 Solve any One**

**08**

a) Convert the following grammar into Chomsky normal form

$S \rightarrow AACD$

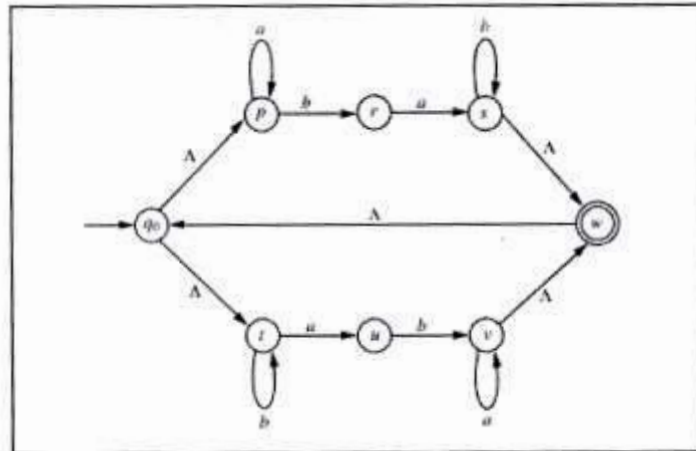
$A \rightarrow aAb|^{\wedge}$

$C \rightarrow aC|a$

$D \rightarrow aDa|bDb|^{\wedge}$

b) Check whether following string is accepted by given NFA-<sup>^</sup>

- 1) aa
- 2) bab
- 3) ab
- 4) abab



Q.4 Draw NFA-<sup>^</sup> for the following Regular expression

$$a^*b^*(ba)^*$$

08

### Section – II

Q.5 Solve any three

12

- a) State and explain pumping lemma for CFL.
- b) What is PDA? Explain with an example.
- c) Obtain a TM to accept the language  
 $L = \{w | w \leftarrow (0 + 1)^* \text{ containing substring } 001\}$
- d) Show that  $L = \{a^n b^n | n \geq 1\}$  is not regular.

Q.6 Solve any One

08

- a) Obtain a PDA to accept the language  
 $L(M) = \{w | w \leftarrow (a + b)^* \text{ and } n_a(w) = n_b(w)\}$  by final state
- b) Explain Different types of variation in TM.

Q.7 State and explain the block diagram of TM and construct a TM to accept the language.

08

$$L(M) = \{a^n b^n c^n | n \geq 1\}$$

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Set **P**

**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In 8085, 16-bit address bus, which can address up to?
  - a) 16KB
  - b) 32KB
  - c) 64KB
  - d) 128KB
- 2) The instruction format 'register to register' has a length of \_\_\_\_\_.
  - a) 2 bytes
  - b) 1 byte
  - c) 3 bytes
  - d) 4 bytes
- 3) The instruction that subtracts 1 from the contents of the specified register/memory location is \_\_\_\_\_.
  - a) INC
  - b) SUBB
  - c) SUB
  - d) DEC
- 4) Which are the part of architecture of 8086?
  - a) The bus interface unit
  - b) The execution unit
  - c) Both a and b
  - d) None of these
- 5) The instruction, CMP to compare source and destination operands it performs \_\_\_\_\_.
  - a) addition
  - b) subtraction
  - c) division
  - d) multiplication
- 6) The directive that marks the end of a logical segment is \_\_\_\_\_.
  - a) ENDS
  - b) END
  - c) ENDS & END
  - d) None of the mentioned
- 7) The ROR instruction rotates the contents of the destination operand to \_\_\_\_\_.
  - a) left
  - b) right
  - c) left and then right
  - d) right and then left
- 8) NMI stands for \_\_\_\_\_.
  - a) nonmaskable interrupt
  - b) nonmultiple interrupt
  - c) nonmovable interrupt
  - d) none of the mentioned



- 9) The Programmable interrupt controller is required to \_\_\_\_\_
  - a) handle one interrupt request
  - b) handle one or more interrupt requests at a time
  - c) handle one or more interrupt requests with a delay
  - d) handle no interrupt request
- 10) How many channels are there in DMA controller?
  - a) 2
  - b) 3
  - c) 4
  - d) 5
- 11) The port that is used for the generation of handshake lines in mode 1 or mode 2 is \_\_\_\_\_
  - a) port A
  - b) port B
  - c) port C Lower
  - d) port C Upper
- 12) In BSR mode, only port C can be used to \_\_\_\_\_
  - a) set individual ports
  - b) reset individual ports
  - c) set and reset individual ports
  - d) programmable I/O ports
- 13) In 8087 Invalid operation is the exception generated due to \_\_\_\_\_
  - a) stack overflow
  - b) stack underflow
  - c) indeterminate form as result
  - d) all of the mentioned
- 14) The unit that is responsible for calculating the address of instructions, and data that the CPU wants to access is \_\_\_\_\_
  - a) bus unit
  - b) address unit
  - c) instruction unit
  - d) control unit

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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

- Q.2 Attempt any three.** **12**  
a) Define microprocessor and explain features of 8085.  
b) Explain flag registers of 8086.  
c) Differentiate between maximum mode and minimum mode of 8086.  
d) Explain Instruction Format with example.
- Q.3 Draw and explain Block diagram of 8085.** **08**
- Q.4 Define instruction and what are different instruction set(group), explain any three group in detail.** **08**

**OR**

Explain programming model of 8085 in detail.

**Section – II**

- Q.5 Attempt any three.** **12**  
a) Define interrupt. What are different types of interrupt?  
b) What is need of DMA explain in brief?  
c) Define handshake and explain its use.  
d) Write and explain any four-instruction used with 8087.
- Q.6 Draw and explain Block diagram of 8259.** **08**
- Q.7 Explain mode 1 as input mode and as output mode of operation of 8255.** **08**

**OR**

Compare between 8086 and 80286.

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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) NMI stands for \_\_\_\_\_  
 a) nonmaskable interrupt                      b) nonmultiple interrupt  
 c) nonmovable interrupt                      d) none of the mentioned
- 2) The Programmable interrupt controller is required to \_\_\_\_\_  
 a) handle one interrupt request  
 b) handle one or more interrupt requests at a time  
 c) handle one or more interrupt requests with a delay  
 d) handle no interrupt request
- 3) How many channels are there in DMA controller?  
 a) 2                                                      b) 3  
 c) 4                                                      d) 5
- 4) The port that is used for the generation of handshake lines in mode 1 or mode 2 is \_\_\_\_\_  
 a) port A                                              b) port B  
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 a) stack overflow                                      b) stack underflow  
 c) indeterminate form as result              d) all of the mentioned
- 7) The unit that is responsible for calculating the address of instructions, and data that the CPU wants to access is \_\_\_\_\_  
 a) bus unit                                              b) address unit  
 c) instruction unit                                      d) control unit

- 8) In 8085, 16-bit address bus, which can address up to?

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- 13) The directive that marks the end of a logical segment is \_\_\_\_\_

  - a) ENDS
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- 14) The ROR instruction rotates the contents of the destination operand to \_\_\_\_\_

  - a) left
  - b) right
  - c) left and then right
  - d) right and then left

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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

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Max. Marks: 56

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**Section – I**

- Q.2 Attempt any three.** **12**  
a) Define microprocessor and explain features of 8085.  
b) Explain flag registers of 8086.  
c) Differentiate between maximum mode and minimum mode of 8086.  
d) Explain Instruction Format with example.
- Q.3 Draw and explain Block diagram of 8085.** **08**
- Q.4 Define instruction and what are different instruction set(group), explain any three group in detail.** **08**

**OR**

Explain programming model of 8085 in detail.

**Section – II**

- Q.5 Attempt any three.** **12**  
a) Define interrupt. What are different types of interrupt?  
b) What is need of DMA explain in brief?  
c) Define handshake and explain its use.  
d) Write and explain any four-instruction used with 8087.
- Q.6 Draw and explain Block diagram of 8259.** **08**
- Q.7 Explain mode 1 as input mode and as output mode of operation of 8255.** **08**

**OR**

Compare between 8086 and 80286.

**Seat  
No.**

| Set | R |
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| 1   | 1 |
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| 100 | 1 |

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The port that is used for the generation of handshake lines in mode 1 or mode 2 is \_\_\_\_\_

a) port A                                      b) port B  
c) port C Lower                                d) port C Upper
- 2) In BSR mode, only port C can be used to \_\_\_\_\_

a) set individual ports                        b) reset individual ports  
c) set and reset individual ports          d) programmable I/O ports
- 3) In 8087 Invalid operation is the exception generated due to \_\_\_\_\_

a) stack overflow                              b) stack underflow  
c) indeterminate form as result          d) all of the mentioned
- 4) The unit that is responsible for calculating the address of instructions, and data that the CPU wants to access is \_\_\_\_\_

a) bus unit                                      b) address unit  
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- 5) In 8085, 16-bit address bus, which can address up to?

a) 16KB                                          b) 32KB  
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- 8) Which are the part of architecture of 8086?

a) The bus interface unit                      b) The execution unit  
c) Both a and b                                 d) None of these

- 9) The instruction, CMP to compare source and destination operands it performs \_\_\_\_\_
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  - b) 3
  - c) 4
  - d) 5

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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**  
a) Define microprocessor and explain features of 8085.  
b) Explain flag registers of 8086.  
c) Differentiate between maximum mode and minimum mode of 8086.  
d) Explain Instruction Format with example.
- Q.3 Draw and explain Block diagram of 8085.** **08**
- Q.4 Define instruction and what are different instruction set(group), explain any three group in detail.** **08**

**OR**

Explain programming model of 8085 in detail.

**Section – II**

- Q.5 Attempt any three.** **12**  
a) Define interrupt. What are different types of interrupt?  
b) What is need of DMA explain in brief?  
c) Define handshake and explain its use.  
d) Write and explain any four-instruction used with 8087.
- Q.6 Draw and explain Block diagram of 8259.** **08**
- Q.7 Explain mode 1 as input mode and as output mode of operation of 8255.** **08**

**OR**

Compare between 8086 and 80286.



# S

- 9) The unit that is responsible for calculating the address of instructions, and data that the CPU wants to access is \_\_\_\_\_
- a) bus unit
  - b) address unit
  - c) instruction unit
  - d) control unit
- 10) In 8085, 16-bit address bus, which can address up to?
- a) 16KB
  - b) 32KB
  - c) 64KB
  - d) 128KB
- 11) The instruction format 'register to register' has a length of \_\_\_\_\_
- a) 2 bytes
  - b) 1 byte
  - c) 3 bytes
  - d) 4 bytes
- 12) The instruction that subtracts 1 from the contents of the specified register/memory location is \_\_\_\_\_
- a) INC
  - b) SUBB
  - c) SUB
  - d) DEC
- 13) Which are the part of architecture of 8086?
- a) The bus interface unit
  - b) The execution unit
  - c) Both a and b
  - d) None of these
- 14) The instruction, CMP to compare source and destination operands it performs \_\_\_\_\_
- a) addition
  - b) subtraction
  - c) division
  - d) multiplication

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**S.Y. (B.Tech) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Microprocessors**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Assume suitable data wherever necessary and mention it clearly.

**Section – I**

- Q.2 Attempt any three.** **12**
- a) Define microprocessor and explain features of 8085.
  - b) Explain flag registers of 8086.
  - c) Differentiate between maximum mode and minimum mode of 8086.
  - d) Explain Instruction Format with example.
- Q.3 Draw and explain Block diagram of 8085.** **08**
- Q.4 Define instruction and what are different instruction set(group), explain any three group in detail.** **08**

**OR**

Explain programming model of 8085 in detail.

**Section – II**

- Q.5 Attempt any three.** **12**
- a) Define interrupt. What are different types of interrupt?
  - b) What is need of DMA explain in brief?
  - c) Define handshake and explain its use.
  - d) Write and explain any four-instruction used with 8087.
- Q.6 Draw and explain Block diagram of 8259.** **08**
- Q.7 Explain mode 1 as input mode and as output mode of operation of 8255.** **08**

**OR**

Compare between 8086 and 80286.

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Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Marks: 14

14

- Page 1 of 12

- 9) In \_\_\_\_\_ traversal root is present the last
- a) in order
  - b) pre order
  - c) post order
  - d) none of these
- 10) Number of nodes in complete binary tree in level 4 \_\_\_\_\_.
- a) 31
  - b) 32
  - c) 16
  - d) 15
- 11) What is an AVL tree?
- a) a tree which is balanced and is a height balanced tree
  - b) a tree which is unbalanced and is a height balanced tree
  - c) a tree with three children
  - d) a tree with atmost 3 children
- 12) If the partially constructed AVL tree having three nodes is left skewed, then \_\_\_\_\_ rotation is applicable to make it balanced
- a) LL
  - b) LR
  - c) RL
  - d) RR
- 13) In a simple graph, the number of edges is equal to twice the sum of the degrees of the vertices.
- a) True
  - b) False
- 14) Graphs are represented using \_\_\_\_\_.
- a) Adjacency tree
  - b) Adjacency linked list
  - c) Adjacency graph
  - d) Adjacency queue

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Structures**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- Define data structure. Explain its types along with example.
- Write a program for Evaluation of postfix expression.
- Define stack. What are the operations of stack & its application?
- Construct a Binary tree with following given orders.  
 Preorder= ABDGHEICFJK  
 InOrder= GDHBEIACJFK
- Write C code for insertion of Node at the beginning of Singly Linked List.

**Q.3 Attempt any two.** **12**

- Explain with example subtraction of polynomial using linked list.
- Write menu driven C code to implement Linear Queue using array.
- Write a program to implement Stack using Linked List.

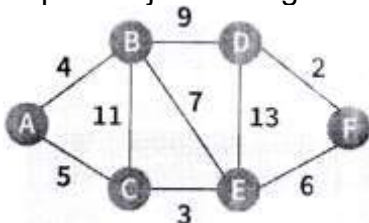
**Section - II**

**Q.4 Attempt any four.** **16**

- Give a brief summary of M-way search tree.
- Compare B tree with B+ Tree
- Write a note on Rotation types in AVL trees.
- Explain how graph is represented with Adjacency Matrix.
- Explain the procedure to delete a node from AVL tree.

**Q.5 Answer any two.** **12**

- Create a AVL tree for following values in given order.  
 63,9,19,27,18,108,99,81.
- Explain B+ Trees with example.
- Explain Dijkstra's algorithm to find shortest path.



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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Structures**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is the most widely used external memory data structure?
  - a) AVL tree
  - b) B-tree
  - c) Red-black tree
  - d) Both AVL tree and Red-black tree
- 2) In \_\_\_\_\_ traversal root is present the last
  - a) in order
  - b) pre order
  - c) post order
  - d) none of these
- 3) Number of nodes in complete binary tree in level 4 \_\_\_\_\_.
  - a) 31
  - b) 32
  - c) 16
  - d) 15
- 4) What is an AVL tree?
  - a) a tree which is balanced and is a height balanced tree
  - b) a tree which is unbalanced and is a height balanced tree
  - c) a tree with three children
  - d) a tree with atmost 3 children
- 5) If the partially constructed AVL tree having three nodes is left skewed, then \_\_\_\_\_ rotation is applicable to make it balanced
  - a) LL
  - b) LR
  - c) RL
  - d) RR
- 6) In a simple graph, the number of edges is equal to twice the sum of the degrees of the vertices.
  - a) True
  - b) False
- 7) Graphs are represented using \_\_\_\_\_.
  - a) Adjacency tree
  - b) Adjacency linked list
  - c) Adjacency graph
  - d) Adjacency queue

- 8) Process of inserting an element in stack is called \_\_\_\_\_.
  - a) Create
  - b) Push
  - c) Evaluation
  - d) Pop
- 9) Which of the following is non-linear data structure?
  - a) Trees
  - b) Stacks
  - c) Array
  - d) Linked List
- 10) Circular Queue is also known as \_\_\_\_\_.
  - a) Ring Buffer
  - b) Square Buffer
  - c) Rectangle Buffer
  - d) Curve Buffer
- 11) With what data structure can a priority queue be implemented?
  - a) Array
  - b) List
  - c) Heap
  - d) Tree
- 12) What is the space complexity for deleting a linked list?
  - a)  $O(1)$
  - b)  $O(n)$
  - c) Either  $O(1)$  or  $O(n)$
  - d)  $O(\log n)$
- 13) The concatenation of two lists can be performed in  $O(1)$  time. Which of the following variation of the linked list can be used?
  - a) Singly linked list
  - b) Doubly linked list
  - c) Circular doubly linked list
  - d) Array implementation of list
- 14) Which of the following c code is used to create new node?
  - a) `ptr = (NODE*)malloc(sizeof(NODE));`
  - b) `ptr = (NODE*)malloc(NODE);`
  - c) `ptr = (NODE*)malloc(sizeof(NODE*));`
  - d) `ptr = (NODE)malloc(sizeof(NODE));`



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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Structures**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- Define data structure. Explain its types along with example.
- Write a program for Evaluation of postfix expression.
- Define stack. What are the operations of stack & its application?
- Construct a Binary tree with following given orders.  
 Preorder= ABDGHEICFJK  
 InOrder= GDHBEIACJFK
- Write C code for insertion of Node at the beginning of Singly Linked List.

**Q.3 Attempt any two.** **12**

- Explain with example subtraction of polynomial using linked list.
- Write menu driven C code to implement Linear Queue using array.
- Write a program to implement Stack using Linked List.

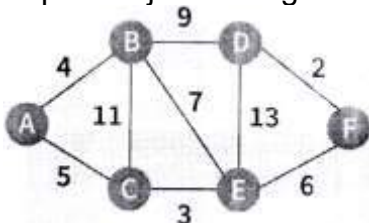
**Section - II**

**Q.4 Attempt any four.** **16**

- Give a brief summary of M-way search tree.
- Compare B tree with B+ Tree
- Write a note on Rotation types in AVL trees.
- Explain how graph is represented with Adjacency Matrix.
- Explain the procedure to delete a node from AVL tree.

**Q.5 Answer any two.** **12**

- Create a AVL tree for following values in given order.  
 63,9,19,27,18,108,99,81.
- Explain B+ Trees with example.
- Explain Dijkstra's algorithm to find shortest path.



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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Structures**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is an AVL tree?
  - a) a tree which is balanced and is a height balanced tree
  - b) a tree which is unbalanced and is a height balanced tree
  - c) a tree with three children
  - d) a tree with atmost 3 children
- 2) If the partially constructed AVL tree having three nodes is left skewed, then \_\_\_\_\_ rotation is applicable to make it balanced
  - a) LL
  - b) LR
  - c) RL
  - d) RR
- 3) In a simple graph, the number of edges is equal to twice the sum of the degrees of the vertices.
  - a) True
  - b) False
- 4) Graphs are represented using \_\_\_\_\_.
  - a) Adjacency tree
  - b) Adjacency linked list
  - c) Adjacency graph
  - d) Adjacency queue
- 5) Process of inserting an element in stack is called \_\_\_\_\_.
  - a) Create
  - b) Push
  - c) Evaluation
  - d) Pop
- 6) Which of the following is non-linear data structure?
  - a) Trees
  - b) Stacks
  - c) Array
  - d) Linked List
- 7) Circular Queue is also known as \_\_\_\_\_.
  - a) Ring Buffer
  - b) Square Buffer
  - c) Rectangle Buffer
  - d) Curve Buffer
- 8) With what data structure can a priority queue be implemented?
  - a) Array
  - b) List
  - c) Heap
  - d) Tree
- 9) What is the space complexity for deleting a linked list?
  - a)  $O(1)$
  - b)  $O(n)$
  - c) Either  $O(1)$  or  $O(n)$
  - d)  $O(\log n)$

- 10)** The concatenation of two lists can be performed in  $O(1)$  time. Which of the following variation of the linked list can be used?
- a) Singly linked list
  - b) Doubly linked list
  - c) Circular doubly linked list
  - d) Array implementation of list
- 11)** Which of the following c code is used to create new node?
- a) `ptr = (NODE*)malloc(sizeof(NODE));`
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- 12)** Which of the following is the most widely used external memory data structure?
- a) AVL tree
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  - c) Red-black tree
  - d) Both AVL tree and Red-black tree
- 13)** In \_\_\_\_\_ traversal root is present the last
- a) in order
  - b) pre order
  - c) post order
  - d) none of these
- 14)** Number of nodes in complete binary tree in level 4 \_\_\_\_\_.
- a) 31
  - b) 32
  - c) 16
  - d) 15

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Structures**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- Define data structure. Explain its types along with example.
- Write a program for Evaluation of postfix expression.
- Define stack. What are the operations of stack & its application?
- Construct a Binary tree with following given orders.  
 Preorder= ABDGHEICFJK  
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- Write C code for insertion of Node at the beginning of Singly Linked List.

**Q.3 Attempt any two.** **12**

- Explain with example subtraction of polynomial using linked list.
- Write menu driven C code to implement Linear Queue using array.
- Write a program to implement Stack using Linked List.

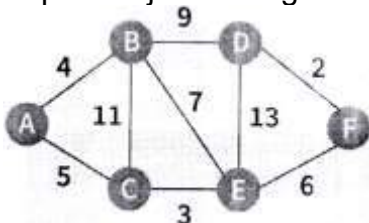
**Section - II**

**Q.4 Attempt any four.** **16**

- Give a brief summary of M-way search tree.
- Compare B tree with B+ Tree
- Write a note on Rotation types in AVL trees.
- Explain how graph is represented with Adjacency Matrix.
- Explain the procedure to delete a node from AVL tree.

**Q.5 Answer any two.** **12**

- Create a AVL tree for following values in given order.  
 63,9,19,27,18,108,99,81.
- Explain B+ Trees with example.
- Explain Dijkstra's algorithm to find shortest path.



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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Structures**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The concatenation of two lists can be performed in  $O(1)$  time. Which of the following variation of the linked list can be used?
  - a) Singly linked list
  - b) Doubly linked list
  - c) Circular doubly linked list
  - d) Array implementation of list
- 2) Which of the following c code is used to create new node?
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  - c) `ptr = (NODE*)malloc(sizeof(NODE*));`
  - d) `ptr = (NODE)malloc(sizeof(NODE));`
- 3) Which of the following is the most widely used external memory data structure?
  - a) AVL tree
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  - c) Red-black tree
  - d) Both AVL tree and Red-black tree
- 4) In \_\_\_\_\_ traversal root is present the last
  - a) in order
  - b) pre order
  - c) post order
  - d) none of these
- 5) Number of nodes in complete binary tree in level 4 \_\_\_\_\_.
  - a) 31
  - b) 32
  - c) 16
  - d) 15
- 6) What is an AVL tree?
  - a) a tree which is balanced and is a height balanced tree
  - b) a tree which is unbalanced and is a height balanced tree
  - c) a tree with three children
  - d) a tree with atmost 3 children
- 7) If the partially constructed AVL tree having three nodes is left skewed, then \_\_\_\_\_ rotation is applicable to make it balanced
  - a) LL
  - b) LR
  - c) RL
  - d) RR

- 8) In a simple graph, the number of edges is equal to twice the sum of the degrees of the vertices.

  - a) True
  - b) False
- 9) Graphs are represented using \_\_\_\_\_.

  - a) Adjacency tree
  - b) Adjacency linked list
  - c) Adjacency graph
  - d) Adjacency queue
- 10) Process of inserting an element in stack is called \_\_\_\_\_.

  - a) Create
  - b) Push
  - c) Evaluation
  - d) Pop
- 11) Which of the following is non-linear data structure?

  - a) Trees
  - b) Stacks
  - c) Array
  - d) Linked List
- 12) Circular Queue is also known as \_\_\_\_\_.

  - a) Ring Buffer
  - b) Square Buffer
  - c) Rectangle Buffer
  - d) Curve Buffer
- 13) With what data structure can a priority queue be implemented?

  - a) Array
  - b) List
  - c) Heap
  - d) Tree
- 14) What is the space complexity for deleting a linked list?

  - a)  $O(1)$
  - b)  $O(n)$
  - c) Either  $O(1)$  or  $O(n)$
  - d)  $O(\log n)$

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Data Structures**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- Define data structure. Explain its types along with example.
- Write a program for Evaluation of postfix expression.
- Define stack. What are the operations of stack & its application?
- Construct a Binary tree with following given orders.  
 Preorder= ABDGHEICFJK  
 InOrder= GDHBEIACJFK
- Write C code for insertion of Node at the beginning of Singly Linked List.

**Q.3 Attempt any two.** **12**

- Explain with example subtraction of polynomial using linked list.
- Write menu driven C code to implement Linear Queue using array.
- Write a program to implement Stack using Linked List.

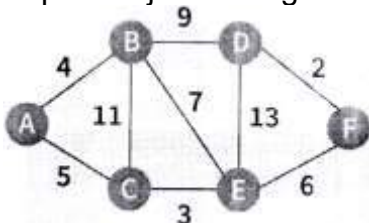
**Section - II**

**Q.4 Attempt any four.** **16**

- Give a brief summary of M-way search tree.
- Compare B tree with B+ Tree
- Write a note on Rotation types in AVL trees.
- Explain how graph is represented with Adjacency Matrix.
- Explain the procedure to delete a node from AVL tree.

**Q.5 Answer any two.** **12**

- Create a AVL tree for following values in given order.  
 63,9,19,27,18,108,99,81.
- Explain B+ Trees with example.
- Explain Dijkstra's algorithm to find shortest path.



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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
  - 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
  - 3) Figures to the right indicates full marks
  - 4) Assume suitable data wherever needed and mention it clearly.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) A best-effort delivery service such as IPv4 includes \_\_\_\_\_.
  - a) error checking
  - b) error correction
  - c) datagram acknowledgment
  - d) none of the above
- 2) A multicast message is sent from \_\_\_\_\_ to \_\_\_\_\_.
  - a) one source; one destination
  - b) one source; multiple destinations
  - c) multiple sources; one destination
  - d) none of the above
- 3) \_\_\_\_\_ is a process-to-process protocol that adds only port addresses, checksum error control, and length information to the data from the upper layer.
  - a) IP
  - b) TCP
  - c) UDP
  - d) The slowest transmission speed are those of
- 4) To accomplish flow control, TCP uses a \_\_\_\_\_ window protocol.
  - a) limited size
  - b) sliding
  - c) fixed-size
  - d) none of the above
- 5) The bytes of data being transferred in each connection are numbered by TCP. The numbering starts with a \_\_\_\_\_.
  - a) 0
  - b) 1
  - c) randomly generated number
  - d) none of the above
- 6) \_\_\_\_\_ server can process multiple requests at a time.
  - a) An iterative
  - b) A concurrent
  - c) A concurrent or an iterative
  - d) None of the choices
- 7) A full domain name is a sequence of labels separated by \_\_\_\_\_.
  - a) semicolons
  - b) dots
  - c) colons
  - d) none of the above





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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day &amp; Date: Friday, 10-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Four) 16**

- Explain Port address and Application specific address with examples.
- Explain classful addressing.
- Write a short note on Persistence Timer.
- Explain SCTP Packet format.
- Shortly describe with diagram the concept of multihoming service offered.

**Q.3 Answer the following questions. (Any One) 06**

- Explain the following system calls with their syntax:
  - socket ()
  - bind ()
  - connect ()
- Explain the steps to implement connection-oriented concurrent client-server.

**Q.4 Explain UDP Package with neat diagram. 06**

**Section – II**

**Q.5 Answer the following questions. (Any Four) 16**

- Explain BOOTP packet format.
- What is SSH? Explain the port forwarding service of SSH.
- Explain connections establishment and termination in TFTP.
- Explain the concept of NVT. Also explain NVT Character set.
- Explain DNS Message format.

**Q.6 Answer the following questions. (Any One) 06**

- Explain the terms used in DNS: Flat Name Space, Hierarchical Name Space, Zone, FQDN and PQDN.
- Draw the diagram of SSH packet format and briefly describe it's fields.

**Q.7 What is TFTP? List the names of five types of TFTP messages, draw and briefly describe TFTP ACK message format. 06**

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) DNS can use the services of \_\_\_\_\_ using the well-known port 53.
  - a) UDP
  - b) TCP
  - c) either (a) or (b)
  - d) none of the above
- 2) When the secondary downloads information from the primary, it is called \_\_\_\_\_ transfer.
  - a) domain
  - b) zone
  - c) label
  - d) none of the above
- 3) When the sender is connected to the mail server via a LAN or a WAN, we need \_\_\_\_\_.
  - a) two MTA
  - b) two UAs and two pairs of MTAs
  - c) two UAs and a pair of MTAs
  - d) none of the above
- 4) NVT uses two sets of characters, one for \_\_\_\_\_ and one for \_\_\_\_\_.
  - a) sending; receiving
  - b) request; reply
  - c) data; control
  - d) none of the above
- 5) In the \_\_\_\_\_ mode, each character typed is sent by the client to the server.
  - a) default
  - b) character
  - c) line
  - d) none of the above
- 6) TELNET uses only one TCP connection. The server uses \_\_\_\_\_ port and the client uses \_\_\_\_\_ port.
  - a) a well-known; another well-known
  - b) an ephemeral; another ephemeral
  - c) a well-known; an ephemeral
  - d) none of the above

- 7) \_\_\_\_\_ is more powerful and complex than \_\_\_\_\_.
  - a) POP3; IMAP4
  - b) IMAP4; POP3
  - c) SMTP; POP3
  - d) none of the above
- 8) A best-effort delivery service such as IPv4 includes \_\_\_\_\_.
  - a) error checking
  - b) error correction
  - c) datagram acknowledgment
  - d) none of the above
- 9) A multicast message is sent from \_\_\_\_\_ to \_\_\_\_\_.
  - a) one source; one destination
  - b) one source; multiple destinations
  - c) multiple sources; one destination
  - d) none of the above
- 10) \_\_\_\_\_ is a process-to-process protocol that adds only port addresses, checksum error control, and length information to the data from the upper layer.
  - a) IP
  - b) TCP
  - c) UDP
  - d) The slowest transmission speed are those of
- 11) To accomplish flow control, TCP uses a \_\_\_\_\_ window protocol.
  - a) limited size
  - b) sliding
  - c) fixed-size
  - d) none of the above
- 12) The bytes of data being transferred in each connection are numbered by TCP. The numbering starts with a \_\_\_\_\_.
  - a) 0
  - b) 1
  - c) randomly generated number
  - d) none of the above
- 13) \_\_\_\_\_ server can process multiple requests at a time.
  - a) An iterative
  - b) A concurrent
  - c) A concurrent or an iterative
  - d) None of the choices
- 14) A full domain name is a sequence of labels separated by \_\_\_\_\_.
  - a) semicolons
  - b) dots
  - c) colons
  - d) none of the above

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day &amp; Date: Friday, 10-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Answer the following questions. (Any Four) 16**

- a) Explain Port address and Application specific address with examples.
- b) Explain classful addressing.
- c) Write a short note on Persistence Timer.
- d) Explain SCTP Packet format.
- e) Shortly describe with diagram the concept of multihoming service offered.

**Q.3 Answer the following questions. (Any One) 06**

- a) Explain the following system calls with their syntax:
  - i) socket ()
  - ii) bind ()
  - iii) connect ()
- b) Explain the steps to implement connection-oriented concurrent client-server.

**Q.4 Explain UDP Package with neat diagram. 06****Section – II****Q.5 Answer the following questions. (Any Four) 16**

- a) Explain BOOTP packet format.
- b) What is SSH? Explain the port forwarding service of SSH.
- c) Explain connections establishment and termination in TFTP.
- d) Explain the concept of NVT. Also explain NVT Character set.
- e) Explain DNS Message format.

**Q.6 Answer the following questions. (Any One) 06**

- a) Explain the terms used in DNS: Flat Name Space, Hierarchical Name Space, Zone, FQDN and PQDN.
- b) Draw the diagram of SSH packet format and briefly describe it's fields.

**Q.7 What is TFTP? List the names of five types of TFTP messages, draw and briefly describe TFTP ACK message format. 06**

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) NVT uses two sets of characters, one for \_\_\_\_\_ and one for \_\_\_\_\_.  
 a) sending; receiving                      b) request; reply  
 c) data; control                              d) none of the above
- 2) In the \_\_\_\_\_ mode, each character typed is sent by the client to the server.  
 a) default                                      b) character  
 c) line                                          d) none of the above
- 3) TELNET uses only one TCP connection. The server uses \_\_\_\_\_ port and the client uses \_\_\_\_\_ port.  
 a) a well-known; another well-known  
 b) an ephemeral; another ephemeral  
 c) a well-known; an ephemeral  
 d) none of the above
- 4) \_\_\_\_\_ is more powerful and complex than \_\_\_\_\_.  
 a) POP3; IMAP4                              b) IMAP4; POP3  
 c) SMTP; POP3                                d) none of the above
- 5) A best-effort delivery service such as IPv4 includes \_\_\_\_\_.  
 a) error checking                              b) error correction  
 c) datagram acknowledgment            d) none of the above
- 6) A multicast message is sent from \_\_\_\_\_ to \_\_\_\_\_.  
 a) one source; one destination  
 b) one source; multiple destinations  
 c) multiple sources; one destination  
 d) none of the above
- 7) \_\_\_\_\_ is a process-to-process protocol that adds only port addresses, checksum error control, and length information to the data from the upper layer.  
 a) IP  
 b) TCP  
 c) UDP  
 d) The slowest transmission speed are those of



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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day &amp; Date: Friday, 10-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All questions are compulsory.  
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**Section – I****Q.2 Answer the following questions. (Any Four) 16**

- a) Explain Port address and Application specific address with examples.
- b) Explain classful addressing.
- c) Write a short note on Persistence Timer.
- d) Explain SCTP Packet format.
- e) Shortly describe with diagram the concept of multihoming service offered.

**Q.3 Answer the following questions. (Any One) 06**

- a) Explain the following system calls with their syntax:
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  - iii) connect ()
- b) Explain the steps to implement connection-oriented concurrent client-server.

**Q.4 Explain UDP Package with neat diagram. 06****Section – II****Q.5 Answer the following questions. (Any Four) 16**

- a) Explain BOOTP packet format.
- b) What is SSH? Explain the port forwarding service of SSH.
- c) Explain connections establishment and termination in TFTP.
- d) Explain the concept of NVT. Also explain NVT Character set.
- e) Explain DNS Message format.

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- a) Explain the terms used in DNS: Flat Name Space, Hierarchical Name Space, Zone, FQDN and PQDN.
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**Q.7 What is TFTP? List the names of five types of TFTP messages, draw and briefly describe TFTP ACK message format. 06**



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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Friday, 10-03-2023  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ server can process multiple requests at a time.
 

|                                 |                        |
|---------------------------------|------------------------|
| a) An iterative                 | b) A concurrent        |
| c) A concurrent or an iterative | d) None of the choices |
- 2) A full domain name is a sequence of labels separated by \_\_\_\_\_.
 

|               |                      |
|---------------|----------------------|
| a) semicolons | b) dots              |
| c) colons     | d) none of the above |
- 3) DNS can use the services of \_\_\_\_\_ using the well-known port 53.
 

|                      |                      |
|----------------------|----------------------|
| a) UDP               | b) TCP               |
| c) either (a) or (b) | d) none of the above |
- 4) When the secondary downloads information from the primary, it is called \_\_\_\_\_ transfer.
 

|           |                      |
|-----------|----------------------|
| a) domain | b) zone              |
| c) label  | d) none of the above |
- 5) When the sender is connected to the mail server via a LAN or a WAN, we need \_\_\_\_\_.
 

|                               |                                  |
|-------------------------------|----------------------------------|
| a) two MTA                    | b) two UAs and two pairs of MTAs |
| c) two UAs and a pair of MTAs | d) none of the above             |
- 6) NVT uses two sets of characters, one for \_\_\_\_\_ and one for \_\_\_\_\_.
 

|                       |                      |
|-----------------------|----------------------|
| a) sending; receiving | b) request; reply    |
| c) data; control      | d) none of the above |
- 7) In the \_\_\_\_\_ mode, each character typed is sent by the client to the server.
 

|            |                      |
|------------|----------------------|
| a) default | b) character         |
| c) line    | d) none of the above |

- 8) TELNET uses only one TCP connection. The server uses \_\_\_\_\_ port and the client uses \_\_\_\_\_ port.
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- 13) To accomplish flow control, TCP uses a \_\_\_\_\_ window protocol.
- a) limited size
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  - c) fixed-size
  - d) none of the above
- 14) The bytes of data being transferred in each connection are numbered by TCP. The numbering starts with a \_\_\_\_\_.
- a) 0
  - b) 1
  - c) randomly generated number
  - d) none of the above

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Computer Networks**

Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- a) Explain Port address and Application specific address with examples.
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  - d) Explain SCTP Packet format.
  - e) Shortly describe with diagram the concept of multihoming service offered.
- Q.3 Answer the following questions. (Any One) 06**
- a) Explain the following system calls with their syntax:
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    - ii) bind ()
    - iii) connect ()
  - b) Explain the steps to implement connection-oriented concurrent client-server.
- Q.4 Explain UDP Package with neat diagram. 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**
- a) Explain BOOTP packet format.
  - b) What is SSH? Explain the port forwarding service of SSH.
  - c) Explain connections establishment and termination in TFTP.
  - d) Explain the concept of NVT. Also explain NVT Character set.
  - e) Explain DNS Message format.
- Q.6 Answer the following questions. (Any One) 06**
- a) Explain the terms used in DNS: Flat Name Space, Hierarchical Name Space, Zone, FQDN and PQDN.
  - b) Draw the diagram of SSH packet format and briefly describe it's fields.
- Q.7 What is TFTP? List the names of five types of TFTP messages, draw and briefly describe TFTP ACK message format. 06**

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Set **P**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The use of Romberg's method is \_\_\_\_\_.  
 a) To solve simultaneous linear equations  
 b) To find root of the equation  
 c) To evaluate definite integration  
 d) To find eigen values
- 2) As soon as a new value of a variable is found by iteration, it is used immediately in the next step, this method is called as \_\_\_\_\_.  
 a) Gauss-Jacobi's method                      b) Gauss-Seidal method  
 c) Gauss-Jordan method                      d) Gauss Elimination method
- 3) When Gauss Elimination method is used to solve set of equation  $AX = B$ , matrix  $A$  is transformed to \_\_\_\_\_.  
 a) Upper triangular matrix                      b) Diagonal matrix  
 c) Lower triangular matrix                      d) Identity matrix
- 4) The number of strips required in Weddel's rule is \_\_\_\_\_.  
 a) A Multiple of 6                                      b) A multiple of 10  
 c) A Multiple of 3                                      d) A multiple of 2
- 5) The order of convergence of Regulafalsi method for finding roots of equation  $(x) = 0$  is \_\_\_\_\_.  
 a) Second order                                      b) Cubic order  
 c) First order                                              d) Very slow
- 6) A root of the equation  $x - \cos x = 0$  lies between \_\_\_\_\_.  
 a) 1 and 2                                              b) 2 and 3  
 c) 0 and 1                                              d) -1 and 0
- 7) The Newton - Raphson method fails when \_\_\_\_\_.  
 a)  $f'(x)$  is negative                                      b)  $f'(x)$  is positive  
 c) Never fails                                              c)  $f'(x)$  is zero
- 8) The Multiplication of closed interval  $[-3,4]. [-3,5] =$  \_\_\_\_\_.  
 a)  $-15,20$                                               b)  $1\ 15, 1\ 20$   
 c)  $[20, -15]$                                               d)  $9,15$

- [illegible]

- a)  $(0,1)$   
c)  $(0,1]$
- b)  $[0,1]$   
d)  $[0,1)$

- Which of the following is true for fuzzy sets?
- a)  $\overline{A \cup B} = \bar{A} \cup \bar{B}$
- b)  $\overline{A \cap B} = \bar{A} \cup \bar{B}$
- c)  $\bar{\bar{A}} \subseteq A$
- d)  $A \subseteq \bar{\bar{A}}$

- |          |   |      |   |      |   |
|----------|---|------|---|------|---|
| $t$ :    | 0 | 0.5  | 1 | 1.5  | 2 |
| $f(t)$ : | 0 | 0.25 | 1 | 2.25 | 4 |

a) 2.66668                      b) 2.66667  
c) 2.66669                      d) None

- 14)** The dominant eigen value of the matrix  $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$  is
- a) 0.3722                      b) -5.3723  
c) 5.3723                      d) 10.7445

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.**

**09**

- Solve the system of equations by using Gauss-Jacobi method  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve the system of equations by using Gauss-Jacobi method.  
 $8x - 3y + 2z = 20, 4x + 11y - z = 33, 6x + 3y + 12z = 35$
- Find a real root of the equation  $e^x = x^3 + \cos 25$  take  $x_0 = 4.5$  by Using Newton-Raphson method correct to 3 decimal places.
- Find positive root of the equation  $x \log_{10} x = 1.2$  by Using false-position method correct to 3 decimal places.
- Using power method find eigen values & corresponding eigen vectors  
 $A = \begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$  take  $x_0 = [1, 0, 0]^T$  upto 5 iterations.

**Q.3 Attempt any three.**

**09**

- Solve the system of equation by using Gauss-Seidal method  
 $83x + 11y - 4z = 95, 7x + 52y + 13z = 104, 3x + 8y + 29z = 71$   
 (three iterations)
- Find the double root of the equation  $x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$  by using generalized Newton-Raphson method.
- Evaluate  $\int_0^{1/2} \int_0^{1/2} \frac{\sin xy}{1+xy} dx dy$  by using Simpson's rule  $h = k = 1/4$
- By using trapezoidal rule, evaluate  $\int_4^{5.2} \log_e x dx, n = 6$
- By using Weddell's rule find  $\int_0^{0.6} e^{-x^2} dx dy$  by taking  $n = 6$

**Q.4 Attempt any two**

- a) Apply factorization method to solve the equations.  
 $3x + 2y + 7z = 4$ ,  $2x + 3y + z = 5$ ,  $3x + 4y + z = 7$
- b) Perform two iterations of Newton-Raphson method of find a solution of the system.  $x^2 + xy = 6$ ,  $x^2 - y^2 = 3$  Take  $x_0 = y_0 = 1$
- c) Evaluate by using Romberg's method.  $I = \int_0^1 \frac{dx}{1+x^2}$  take  $h = 0.5, 0.25, 0.125$  respectively.

**Section – II****Q.5 Attempt any three**

09

- a) Let  $A, B$  be the fuzzy sets define on universal set  $X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3\}$  as  
 $A = \frac{1}{-5} + \frac{0.75}{-4} + \frac{0.20}{-3} + \frac{0.8}{-2} + \frac{0.32}{-1} + \frac{0.28}{0} + \frac{0.9}{1} + \frac{0.65}{2} + \frac{1}{3}$   
 $B = \frac{0}{-5} + \frac{0.80}{-4} + \frac{0.20}{-3} + \frac{0.70}{-2} + \frac{0.20}{-1} + \frac{0.15}{0} + \frac{1}{1} + \frac{0.60}{2} + \frac{1}{3}$  find  $S(A, B)$ ,  $S(B, A)$
- b) Find Strong  $\alpha$ -cuts of the fuzzy set  $A$  defined by membership function.  

$$A(x) = \begin{cases} \frac{x-10}{20} & 10 \leq x \leq 30 \\ \frac{40-x}{10} & 30 < x \leq 40 \\ 0 & \text{otherwise} \end{cases} \quad \text{for } \alpha = 0, 0.3, 0.9$$
- c) Solve  $Max z = 3x_1 + 4x_2$  subject to constraints  
 $x_1 - x_2 \leq 1$   $-x_1 + x_2 \leq 2$   $x_1, x_2 \geq 0$
- d) Verify which of the following fuzzy sets are fuzzy number  
 i)  $A = 1/1 + \frac{0.5}{2} + \frac{0.6}{3} + \frac{0.7}{4} + \frac{0.8}{5}$   
 ii)  $B(x) = \log x, x \in [1, 2.72]$   
 iii) Customer relationship management
- e) Find  $f(A)$ , is  $A$  be a fuzzy set defined on universal set  
 $X = \{-3, -2, -1, 0, 1, 2, 3\}$  by the membership function  $A(x) = \frac{x+3}{10} \forall x \in X$  &  
 $f$  be a function defined on  $X$  as  $f(x) = 2x^2 + 10$

**Q.6 Attempt any three**

09

- a) Let  $A$  be a fuzzy set defined on universal set  $x = \{0, 1, 2, 3, 4, 5\}$  by the membership function  $A(x) = e^{-x} \forall x \in X$ . Then fuzzy cardinality of  $A$
- b) Let  $A, B$  be any two fuzzy sets defined on universal set  $X$  an  $\alpha, \beta \in [0, 1]$  then prove that  
 i)  ${}^\alpha(A \cap B) = {}^\alpha A \cap {}^\alpha B$   
 ii) If  $\alpha \leq \beta$  then  ${}^\beta A \subseteq {}^\alpha B$
- c) A building firm possesses four cranes each of which has a distance (km) from four different constructions sites as shown in table

|       | I   | II  | III | IV  |
|-------|-----|-----|-----|-----|
| $C_1$ | 90  | 75  | 75  | 80  |
| $C_2$ | 35  | 85  | 55  | 65  |
| $C_3$ | 125 | 95  | 90  | 105 |
| $C_4$ | 45  | 110 | 95  | 115 |

Place the cranes (one for each construction site) in such a way that the overall distance required for the transfer is as small as possible.

- d) Solve the fuzzy equation  $A + X = B$  where  $A, B$  are fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x-9}{2} & 9 \leq x \leq 11 \\ \frac{14-x}{3} & 11 < x \leq 14 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-5}{9-x} & 5 \leq x \leq 6 \\ \frac{3}{3} & 6 < x \leq 9 \\ 0 & \text{otherwise} \end{cases}$$

- e) Let  $A$  be a fuzzy set defined on universal set  $[-1,1]$  by the membership function

$$A(x) = \begin{cases} x+1 & -1 \leq x \leq 0 \\ 1-x & 0 < x \leq 1 \end{cases}$$

- Find i) Boundary of  $A$   
ii) Core of  $A$

### Q.7 Attempt any two

10

- a) Max  $z = 4x_1 + 3x_2 + 6x_3$  subject to

$$2x_1 + 3x_2 + 2x_3 \leq 440$$

$$4x_1 + 3x_2 \leq 470$$

$$2x_1 + 5x_2 \leq 430 \quad x_1, x_2, x_3 \geq 0$$

- b) Let  $A, B$  the fuzzy number defined by the membership functions

$$A(x) = \begin{cases} \frac{x-1}{4} & 1 \leq x \leq 15 \\ 6-x & 5 \leq x \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-6}{4} & 6 \leq x \leq 10 \\ 11-x & 10 < x \leq 11 \\ 0 & \text{otherwise} \end{cases}$$

Find  $\text{Max}(A, B)$

- c) Let  $A, B$  be the fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x+5}{2} & -5 \leq x \leq -3 \\ -x/3 & -3 < x \leq 0 \\ 0 & \text{otherwise} \end{cases}$$

Find a fuzzy number  $A, B$



**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- |          |   |      |   |      |   |
|----------|---|------|---|------|---|
| $t$ :    | 0 | 0.5  | 1 | 1.5  | 2 |
| $f(t)$ : | 0 | 0.25 | 1 | 2.25 | 4 |

**7)** The dominant eigen value of the matrix  $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$  is

a) 0.3722                      b) -5.3723  
c) 5.3723                      d) 10.7445

- 8) The use of Romberg's method is \_\_\_\_\_.  
a) To solve simultaneous linear equations  
b) To find root of the equation  
c) To evaluate definite integration  
d) To find eigen values
- 9) As soon as a new value of a variable is found by iteration, it is used immediately in the next step, this method is called as \_\_\_\_\_.  
a) Gauss-Jacobi's method                      b) Gauss-Seidal method  
c) Gauss-Jordan method                      d) Gauss Elimination method
- 10) When Gauss Elimination method is used to solve set of equation  $AX = B$ , matrix  $A$  is transformed to \_\_\_\_\_.  
a) Upper triangular matrix                      b) Diagonal matrix  
c) Lower triangular matrix                      d) Identity matrix
- 11) The number of strips required in Weddel's rule is \_\_\_\_\_.  
a) A Multiple of 6                                      b) A multiple of 10  
c) A Multiple of 3                                      d) A multiple of 2
- 12) The order of convergence of Regulafalsi method for finding roots of equation  $(x) = 0$  is \_\_\_\_\_.  
a) Second order                                      b) Cubic order  
c) First order                                              d) Very slow
- 13) A root of the equation  $x - \cos x = 0$  lies between \_\_\_\_\_.  
a) 1 and 2                                              b) 2 and 3  
c) 0 and 1                                              d) -1 and 0
- 14) The Newton - Raphson method fails when \_\_\_\_\_.  
a)  $f'(x)$  is negative                                      b)  $f'(x)$  is positive  
c) Never fails                                              c)  $f'(x)$  is zero

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| Seat No. |  |
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Set **Q**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.**

**09**

- Solve the system of equations by using Gauss-Jacobi method  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve the system of equations by using Gauss-Jacobi method.  
 $8x - 3y + 2z = 20, 4x + 11y - z = 33, 6x + 3y + 12z = 35$
- Find a real root of the equation  $e^x = x^3 + \cos 25$  take  $x_0 = 4.5$  by Using Newton-Raphson method correct to 3 decimal places.
- Find positive root of the equation  $x \log_{10} x = 1.2$  by Using false-position method correct to 3 decimal places.
- Using power method find eigen values & corresponding eigen vectors  
 $A = \begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$  take  $x_0 = [1, 0, 0]^T$  upto 5 iterations.

**Q.3 Attempt any three.**

**09**

- Solve the system of equation by using Gauss-Seidal method  
 $83x + 11y - 4z = 95, 7x + 52y + 13z = 104, 3x + 8y + 29z = 71$   
 (three iterations)
- Find the double root of the equation  $x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$  by using generalized Newton-Raphson method.
- Evaluate  $\int_0^{1/2} \int_0^{1/2} \frac{\sin xy}{1+xy} dx dy$  by using Simpson's rule  $h = k = 1/4$
- By using trapezoidal rule, evaluate  $\int_4^{5.2} \log_e x dx, n = 6$
- By using Weddell's rule find  $\int_0^{0.6} e^{-x^2} dx dy$  by taking  $n = 6$

**Q.4 Attempt any two**

- a) Apply factorization method to solve the equations.  
 $3x + 2y + 7z = 4$ ,  $2x + 3y + z = 5$ ,  $3x + 4y + z = 7$
- b) Perform two iterations of Newton-Raphson method of find a solution of the system.  $x^2 + xy = 6$ ,  $x^2 - y^2 = 3$  Take  $x_0 = y_0 = 1$
- c) Evaluate by using Romberg's method.  $I = \int_0^1 \frac{dx}{1+x^2}$  take  $h = 0.5, 0.25, 0.125$  respectively.

**Section – II****Q.5 Attempt any three**

09

- a) Let  $A, B$  be the fuzzy sets define on universal set  $X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3\}$  as  
 $A = \frac{1}{-5} + \frac{0.75}{-4} + \frac{0.20}{-3} + \frac{0.8}{-2} + \frac{0.32}{-1} + \frac{0.28}{0} + \frac{0.9}{1} + \frac{0.65}{2} + \frac{1}{3}$   
 $B = \frac{0}{-5} + \frac{0.80}{-4} + \frac{0.20}{-3} + \frac{0.70}{-2} + \frac{0.20}{-1} + \frac{0.15}{0} + \frac{1}{1} + \frac{0.60}{2} + \frac{1}{3}$  find  $S(A, B)$ ,  $S(B, A)$
- b) Find Strong  $\alpha$ -cuts of the fuzzy set  $A$  defined by membership function.  

$$A(x) = \begin{cases} \frac{x-10}{20} & 10 \leq x \leq 30 \\ \frac{40-x}{10} & 30 < x \leq 40 \\ 0 & \text{otherwise} \end{cases} \quad \text{for } \alpha = 0, 0.3, 0.9$$
- c) Solve  $Max z = 3x_1 + 4x_2$  subject to constraints  
 $x_1 - x_2 \leq 1$   $-x_1 + x_2 \leq 2$   $x_1, x_2 \geq 0$
- d) Verify which of the following fuzzy sets are fuzzy number  
 i)  $A = 1/1 + \frac{0.5}{2} + \frac{0.6}{3} + \frac{0.7}{4} + \frac{0.8}{5}$   
 ii)  $B(x) = \log x, x \in [1, 2.72]$   
 iii) Customer relationship management
- e) Find  $f(A)$ , is  $A$  be a fuzzy set defined on universal set  
 $X = \{-3, -2, -1, 0, 1, 2, 3\}$  by the membership function  $A(x) = \frac{x+3}{10} \forall x \in X$  &  
 $f$  be a function defined on  $X$  as  $f(x) = 2x^2 + 10$

**Q.6 Attempt any three**

09

- a) Let  $A$  be a fuzzy set defined on universal set  $x = \{0, 1, 2, 3, 4, 5\}$  by the membership function  $A(x) = e^{-x} \forall x \in X$ . Then fuzzy cardinality of  $A$
- b) Let  $A, B$  be any two fuzzy sets defined on universal set  $X$  an  $\alpha, \beta \in [0, 1]$  then prove that  
 i)  ${}^\alpha(A \cap B) = {}^\alpha A \cap {}^\alpha B$   
 ii) If  $\alpha \leq \beta$  then  ${}^\beta A \subseteq {}^\alpha A$
- c) A building firm possesses four cranes each of which has a distance (km) from four different constructions sites as shown in table

|       | I   | II  | III | IV  |
|-------|-----|-----|-----|-----|
| $C_1$ | 90  | 75  | 75  | 80  |
| $C_2$ | 35  | 85  | 55  | 65  |
| $C_3$ | 125 | 95  | 90  | 105 |
| $C_4$ | 45  | 110 | 95  | 115 |

Place the cranes (one for each construction site) in such a way that the overall distance required for the transfer is as small as possible.

- d) Solve the fuzzy equation  $A + X = B$  where  $A, B$  are fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x-9}{2} & 9 \leq x \leq 11 \\ \frac{14-x}{3} & 11 < x \leq 14 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-5}{9-x} & 5 \leq x \leq 6 \\ \frac{3}{0} & 6 < x \leq 9 \\ 0 & \text{otherwise} \end{cases}$$

- e) Let  $A$  be a fuzzy set defined on universal set  $[-1,1]$  by the membership function

$$A(x) = \begin{cases} x+1 & -1 \leq x \leq 0 \\ 1-x & 0 < x \leq 1 \end{cases}$$

- Find i) Boundary of  $A$   
ii) Core of  $A$

### Q.7 Attempt any two

10

- a) Max  $z = 4x_1 + 3x_2 + 6x_3$  subject to

$$2x_1 + 3x_2 + 2x_3 \leq 440$$

$$4x_1 + 3x_2 \leq 470$$

$$2x_1 + 5x_2 \leq 430 \quad x_1, x_2, x_3 \geq 0$$

- b) Let  $A, B$  the fuzzy number defined by the membership functions

$$A(x) = \begin{cases} \frac{x-1}{4} & 1 \leq x \leq 15 \\ 6-x & 5 \leq x \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-6}{4} & 6 \leq x \leq 10 \\ 11-x & 10 < x \leq 11 \\ 0 & \text{otherwise} \end{cases}$$

Find  $Max(A, B)$

- c) Let  $A, B$  be the fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x+5}{2} & -5 \leq x \leq -3 \\ -x/3 & -3 < x \leq 0 \\ 0 & \text{otherwise} \end{cases}$$

Find a fuzzy number  $A, B$

|                 |  |
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| <b>Seat No.</b> |  |
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| Seat No. |  |
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Set **R**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.**

**09**

- Solve the system of equations by using Gauss-Jacobi method  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve the system of equations by using Gauss-Jacobi method.  
 $8x - 3y + 2z = 20, 4x + 11y - z = 33, 6x + 3y + 12z = 35$
- Find a real root of the equation  $e^x = x^3 + \cos 25$  take  $x_0 = 4.5$  by Using Newton-Raphson method correct to 3 decimal places.
- Find positive root of the equation  $x \log_{10} x = 1.2$  by Using false-position method correct to 3 decimal places.
- Using power method find eigen values & corresponding eigen vectors  
 $A = \begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$  take  $x_0 = [1, 0, 0]^T$  upto 5 iterations.

**Q.3 Attempt any three.**

**09**

- Solve the system of equation by using Gauss-Seidal method  
 $83x + 11y - 4z = 95, 7x + 52y + 13z = 104, 3x + 8y + 29z = 71$   
 (three iterations)
- Find the double root of the equation  $x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$  by using generalized Newton-Raphson method.
- Evaluate  $\int_0^{1/2} \int_0^{1/2} \frac{\sin xy}{1+xy} dx dy$  by using Simpson's rule  $h = k = 1/4$
- By using trapezoidal rule, evaluate  $\int_4^{5.2} \log_e x dx, n = 6$
- By using Weddell's rule find  $\int_0^{0.6} e^{-x^2} dx dy$  by taking  $n = 6$



**Q.4 Attempt any two**

- a) Apply factorization method to solve the equations.  
 $3x + 2y + 7z = 4$ ,  $2x + 3y + z = 5$ ,  $3x + 4y + z = 7$
- b) Perform two iterations of Newton-Raphson method of find a solution of the system.  $x^2 + xy = 6$ ,  $x^2 - y^2 = 3$  Take  $x_0 = y_0 = 1$
- c) Evaluate by using Romberg's method.  $I = \int_0^1 \frac{dx}{1+x^2}$  take  $h = 0.5, 0.25, 0.125$  respectively.

**Section – II****Q.5 Attempt any three**

09

- a) Let  $A, B$  be the fuzzy sets define on universal set  $X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3\}$  as  
 $A = \frac{1}{-5} + \frac{0.75}{-4} + \frac{0.20}{-3} + \frac{0.8}{-2} + \frac{0.32}{-1} + \frac{0.28}{0} + \frac{0.9}{1} + \frac{0.65}{2} + \frac{1}{3}$   
 $B = \frac{0}{-5} + \frac{0.80}{-4} + \frac{0.20}{-3} + \frac{0.70}{-2} + \frac{0.20}{-1} + \frac{0.15}{0} + \frac{1}{1} + \frac{0.60}{2} + \frac{1}{3}$  find  $S(A, B)$ ,  $S(B, A)$
- b) Find Strong  $\alpha$ -cuts of the fuzzy set  $A$  defined by membership function.  

$$A(x) = \begin{cases} \frac{x-10}{20} & 10 \leq x \leq 30 \\ \frac{40-x}{10} & 30 < x \leq 40 \\ 0 & \text{otherwise} \end{cases} \quad \text{for } \alpha = 0, 0.3, 0.9$$
- c) Solve  $Max z = 3x_1 + 4x_2$  subject to constraints  
 $x_1 - x_2 \leq 1$   $-x_1 + x_2 \leq 2$   $x_1, x_2 \geq 0$
- d) Verify which of the following fuzzy sets are fuzzy number  
 i)  $A = 1/1 + \frac{0.5}{2} + \frac{0.6}{3} + \frac{0.7}{4} + \frac{0.8}{5}$   
 ii)  $B(x) = \log x, x \in [1, 2.72]$   
 iii) Customer relationship management
- e) Find  $f(A)$ , is  $A$  be a fuzzy set defined on universal set  
 $X = \{-3, -2, -1, 0, 1, 2, 3\}$  by the membership function  $A(x) = \frac{x+3}{10} \forall x \in X$  &  
 $f$  be a function defined on  $X$  as  $f(x) = 2x^2 + 10$

**Q.6 Attempt any three**

09

- a) Let  $A$  be a fuzzy set defined on universal set  $x = \{0, 1, 2, 3, 4, 5\}$  by the membership function  $A(x) = e^{-x} \forall x \in X$ . Then fuzzy cardinality of  $A$
- b) Let  $A, B$  be any two fuzzy sets defined on universal set  $X$  an  $\alpha, \beta \in [0, 1]$  then prove that  
 i)  ${}^\alpha(A \cap B) = {}^\alpha A \cap {}^\alpha B$   
 ii) If  $\alpha \leq \beta$  then  ${}^\beta A \subseteq {}^\alpha A$
- c) A building firm possesses four cranes each of which has a distance (km) from four different constructions sites as shown in table

|       | I   | II  | III | IV  |
|-------|-----|-----|-----|-----|
| $C_1$ | 90  | 75  | 75  | 80  |
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| $C_3$ | 125 | 95  | 90  | 105 |
| $C_4$ | 45  | 110 | 95  | 115 |

Place the cranes (one for each construction site) in such a way that the overall distance required for the transfer is as small as possible.

- d) Solve the fuzzy equation  $A + X = B$  where  $A, B$  are fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x-9}{2} & 9 \leq x \leq 11 \\ \frac{14-x}{3} & 11 < x \leq 14 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-5}{9-x} & 5 \leq x \leq 6 \\ \frac{3}{0} & 6 < x \leq 9 \\ 0 & \text{otherwise} \end{cases}$$

- e) Let  $A$  be a fuzzy set defined on universal set  $[-1,1]$  by the membership function

$$A(x) = \begin{cases} x+1 & -1 \leq x \leq 0 \\ 1-x & 0 < x \leq 1 \end{cases}$$

- Find i) Boundary of  $A$   
ii) Core of  $A$

### Q.7 Attempt any two

10

- a) Max  $z = 4x_1 + 3x_2 + 6x_3$  subject to

$$2x_1 + 3x_2 + 2x_3 \leq 440$$

$$4x_1 + 3x_2 \leq 470$$

$$2x_1 + 5x_2 \leq 430 \quad x_1, x_2, x_3 \geq 0$$

- b) Let  $A, B$  the fuzzy number defined by the membership functions

$$A(x) = \begin{cases} \frac{x-1}{4} & 1 \leq x \leq 15 \\ 6-x & 5 \leq x \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-6}{4} & 6 \leq x \leq 10 \\ 11-x & 10 < x \leq 11 \\ 0 & \text{otherwise} \end{cases}$$

Find  $\text{Max}(A, B)$

- c) Let  $A, B$  be the fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x+5}{2} & -5 \leq x \leq -3 \\ -x/3 & -3 < x \leq 0 \\ 0 & \text{otherwise} \end{cases}$$

Find a fuzzy number  $A, B$

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 16 of 20

|          |   |      |   |      |   |
|----------|---|------|---|------|---|
| $t$ :    | 0 | 0.5  | 1 | 1.5  | 2 |
| $f(t)$ : | 0 | 0.25 | 1 | 2.25 | 4 |

a) 2.66668                      b) 2.66667  
c) 2.66669                      d) None

a) 0.3722                      b) -5.3723  
c) 5.3723                        d) 10.7445

- a) To solve simultaneous linear equations
- b) To find root of the equation
- c) To evaluate definite integration
- d) To find eigen values

a) Gauss-Jacobi's method      b) Gauss-Seidal method  
c) Gauss-Jordan method      d) Gauss Elimination method

a) Upper triangular matrix      b) Diagonal matrix  
c) Lower triangular matrix      d) Identity matrix

a) A Multiple of 6                      b) A multiple of 10  
c) A Multiple of 3                        d) A multiple of 2

a) Second order                      b) Cubic order  
c) First order                         d) Very slow

|          |  |
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| Seat No. |  |
|----------|--|

Set **S**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**COMPUTER SCIENCE & ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.**

09

- Solve the system of equations by using Gauss-Jacobi method  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve the system of equations by using Gauss-Jacobi method.  
 $8x - 3y + 2z = 20, 4x + 11y - z = 33, 6x + 3y + 12z = 35$
- Find a real root of the equation  $e^x = x^3 + \cos 25$  take  $x_0 = 4.5$  by Using Newton-Raphson method correct to 3 decimal places.
- Find positive root of the equation  $x \log_{10} x = 1.2$  by Using false-position method correct to 3 decimal places.
- Using power method find eigen values & corresponding eigen vectors  
 $A = \begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$  take  $x_0 = [1, 0, 0]^T$  upto 5 iterations.

**Q.3 Attempt any three.**

09

- Solve the system of equation by using Gauss-Seidal method  
 $83x + 11y - 4z = 95, 7x + 52y + 13z = 104, 3x + 8y + 29z = 71$   
 (three iterations)
- Find the double root of the equation  $x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$  by using generalized Newton-Raphson method.
- Evaluate  $\int_0^{1/2} \int_0^{1/2} \frac{\sin xy}{1+xy} dx dy$  by using Simpson's rule  $h = k = 1/4$
- By using trapezoidal rule, evaluate  $\int_4^{5.2} \log_e x dx, n = 6$
- By using Weddell's rule find  $\int_0^{0.6} e^{-x^2} dx dy$  by taking  $n = 6$

**Q.4 Attempt any two**

- a) Apply factorization method to solve the equations.  
 $3x + 2y + 7z = 4$ ,  $2x + 3y + z = 5$ ,  $3x + 4y + z = 7$
- b) Perform two iterations of Newton-Raphson method of find a solution of the system.  $x^2 + xy = 6$ ,  $x^2 - y^2 = 3$  Take  $x_0 = y_0 = 1$
- c) Evaluate by using Romberg's method.  $I = \int_0^1 \frac{dx}{1+x^2}$  take  $h = 0.5, 0.25, 0.125$  respectively.

**Section – II**

**Q.5 Attempt any three**

09

- a) Let  $A, B$  be the fuzzy sets define on universal set  $X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3\}$  as  
 $A = \frac{1}{-5} + \frac{0.75}{-4} + \frac{0.20}{-3} + \frac{0.8}{-2} + \frac{0.32}{-1} + \frac{0.28}{0} + \frac{0.9}{1} + \frac{0.65}{2} + \frac{1}{3}$   
 $B = \frac{0}{-5} + \frac{0.80}{-4} + \frac{0.20}{-3} + \frac{0.70}{-2} + \frac{0.20}{-1} + \frac{0.15}{0} + \frac{1}{1} + \frac{0.60}{2} + \frac{1}{3}$  find  $S(A, B)$ ,  $S(B, A)$
- b) Find Strong  $\alpha$ -cuts of the fuzzy set  $A$  defined by membership function.  
 $A(x) = \begin{cases} \frac{x-10}{20} & 10 \leq x \leq 30 \\ \frac{40-x}{10} & 30 < x \leq 40 \\ 0 & \text{otherwise} \end{cases}$  for  $\alpha = 0, 0.3, 0.9$
- c) Solve  $Max z = 3x_1 + 4x_2$  subject to constraints  
 $x_1 - x_2 \leq 1$   $-x_1 + x_2 \leq 2$   $x_1, x_2 \geq 0$
- d) Verify which of the following fuzzy sets are fuzzy number  
i)  $A = 1/1 + \frac{0.5}{2} + \frac{0.6}{3} + \frac{0.7}{4} + \frac{0.8}{5}$   
ii)  $B(x) = \log x, x \in [1, 2.72]$   
iii) Customer relationship management
- e) Find  $f(A)$ , is  $A$  be a fuzzy set defined on universal set  
 $X = \{-3, -2, -1, 0, 1, 2, 3\}$  by the membership function  $A(x) = \frac{x+3}{10} \forall x \in X$  &  
 $f$  be a function defined on  $X$  as  $f(x) = 2x^2 + 10$

**Q.6 Attempt any three**

09

- a) Let  $A$  be a fuzzy set defined on universal set  $x = \{0, 1, 2, 3, 4, 5\}$  by the membership function  $A(x) = e^{-x} \forall x \in X$ . Then fuzzy cardinality of  $A$
- b) Let  $A, B$  be any two fuzzy sets defined on universal set  $X$  an  $\alpha, \beta \in [0, 1]$  then prove that  
i)  ${}^\alpha(A \cap B) = {}^\alpha A \cap {}^\alpha B$   
ii) If  $\alpha \leq \beta$  then  ${}^\beta A \subseteq {}^\alpha A$
- c) A building firm possesses four cranes each of which has a distance (km) from four different constructions sites as shown in table

|       | I   | II  | III | IV  |
|-------|-----|-----|-----|-----|
| $C_1$ | 90  | 75  | 75  | 80  |
| $C_2$ | 35  | 85  | 55  | 65  |
| $C_3$ | 125 | 95  | 90  | 105 |
| $C_4$ | 45  | 110 | 95  | 115 |

Place the cranes (one for each construction site) in such a way that the overall distance required for the transfer is as small as possible.

- d) Solve the fuzzy equation  $A + X = B$  where  $A, B$  are fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x-9}{2} & 9 \leq x \leq 11 \\ \frac{14-x}{3} & 11 < x \leq 14 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} x-5 & 5 \leq x \leq 6 \\ \frac{9-x}{3} & 6 < x \leq 9 \\ 0 & \text{otherwise} \end{cases}$$

- e) Let  $A$  be a fuzzy set defined on universal set  $[-1,1]$  by the membership function

$$A(x) = \begin{cases} x+1 & -1 \leq x \leq 0 \\ 1-x & 0 < x \leq 1 \end{cases}$$

- Find i) Boundary of  $A$   
ii) Core of  $A$

**Q.7 Attempt any two**

**10**

- a) Max  $z = 4x_1 + 3x_2 + 6x_3$  subject to

$$2x_1 + 3x_2 + 2x_3 \leq 440$$

$$4x_1 + 3x_2 \leq 470$$

$$2x_1 + 5x_2 \leq 430 \quad x_1, x_2, x_3 \geq 0$$

- b) Let  $A, B$  the fuzzy number defined by the membership functions

$$A(x) = \begin{cases} \frac{x-1}{4} & 1 \leq x \leq 15 \\ 6-x & 5 \leq x \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-6}{4} & 6 \leq x \leq 10 \\ 11-x & 10 < x \leq 11 \\ 0 & \text{otherwise} \end{cases}$$

Find  $Max(A, B)$

- c) Let  $A, B$  be the fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x+5}{2} & -5 \leq x \leq -3 \\ -x/3 & -3 < x \leq 0 \\ 0 & \text{otherwise} \end{cases}$$

Find a fuzzy number  $A, B$

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electronic Circuit Analysis and Design**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The transistor biasing circuit which provides least thermal stability is \_\_\_\_\_ bias circuit.
 

|                           |                            |
|---------------------------|----------------------------|
| a) Voltage divider        | b) Fixed                   |
| c) Collector to base bias | d) Thermistor compensation |
- 2) Input and output resistance of CC amplifier is \_\_\_\_\_ & \_\_\_\_\_ respectively.
 

|               |                |
|---------------|----------------|
| a) Low & low  | b) High & high |
| c) Low & high | d) High & low  |
- 3) H parameter obtained from input characteristics of transistor is \_\_\_\_\_.
 

|             |                  |
|-------------|------------------|
| a) $h_{ie}$ | b) $h_{fe}$      |
| c) $h_{oe}$ | d) None of these |
- 4) The slope of DC load line of a transistor CE amplifier is
 

|                     |            |
|---------------------|------------|
| a) $-1/(R_C + R_E)$ | b) $1/R_C$ |
| c) $1/R_L$          | d) zero    |
- 5) Cascading two amplifiers will result in \_\_\_\_\_.
 

|                                      |
|--------------------------------------|
| a) reduction in gain increase in BW  |
| b) increase in gain decrease in BW   |
| c) reduction in gain reduction in BW |
| d) None of these                     |
- 6) The outstanding characteristic of direct coupled amplifier is \_\_\_\_\_.
 

|                            |                          |
|----------------------------|--------------------------|
| a) utmost economy          | b) temperature stability |
| c) amplifies low frequency | d) None of these         |
- 7) When emitter bypass capacitor is removed from RC coupled amplifier circuit it results to
 

|                                     |
|-------------------------------------|
| a) voltage series negative feedback |
| b) voltage shunt negative feedback  |
| c) current series negative feedback |
| d) current shunt negative feedback  |



- 8) When voltage series negative feedback is applied to an amplifier. its input impedance and output impedance
- a) Increases, Decreases
  - b) Decreases, Increases
  - c) Remains the same
  - d) Increases, Increases
- 9) In an RC phase shift oscillator, the minimum number of RC networks to be connected in cascade will be \_\_\_\_.
- a) One
  - b) Two
  - c) Three
  - d) Four
- 10) The maximum theoretical efficiency of class B Push pull power amplifier is \_\_\_\_.
- a) 50%
  - b) 62.5%
  - c) 78.5%
  - d) 25%
- 11) Location of Q point is fixed at three locations, namely middle, at cutoff and below cutoff of the amplifier characteristics, then the resulting power amplifier configurations are \_\_\_\_, \_\_\_\_, \_\_\_\_ respectively.
- a) Class B, Class A, Class C
  - b) Class A, Class B, Class C
  - c) Class A, Class AB, Class C
  - d) Class A, Class C, Class AB
- 12) The region in which  $V_{ds} > V_p$  &  $V_{gs} > V_p$  for N channel JFET is called as
- a) Ohmic region
  - b) Cutoff region
  - c) Pinch off region
  - d) None of these
- 13) JFET operates as Voltage Variable Resistor in \_\_\_\_ region.
- a) Ohmic
  - b) Pinch off
  - c) Active
  - d) none of the these
- 14) MOSFET can be used as \_\_\_\_.
- a) Voltage controlled capacitor
  - b) Voltage controlled inductor
  - c) Current controlled capacitor
  - d) Current controlled inductor

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electronic Circuit Analysis and Design**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.  
 4) Draw neat diagram whenever necessary.

**Section – I**

- Q.2 Attempt any four** **16**
- Obtain H-parameter model & define H parameters for transistor in CB circuit configuration.
  - Explain Q point stabilization in transistor collector to base bias circuit.
  - What is the need of cascading and explain any one coupling schemes along with frequency response?
  - "Input resistance increases and output resistance decreases for voltage series feedback amplifier", Justify the statement.
  - Compare effect of voltage series, current series, current shunt and voltage shunt feedback topologies on amplifier characteristics.
- Q.3 Attempt any two** **12**
- Consider transistor CE amplifier with  $R_L = 1 K\Omega$ ,  $h_{ie} = 1 K\Omega$ ,  $h_{re} = 2 \times 10^{-4}$ ,  $h_{fe} = 50$ ,  $h_{oe} = 25 \mu S$ ,  $R_s = 800\Omega$ . Calculate  $A_i$ ,  $A_v$ ,  $R_i$ ,  $R_o$
  - Design a single CE amplifier with voltage divider bias for voltage of voltage gain of 40 & output voltage of 4 volt peak and stability factor 10.  
 $P_{D max.} = 225mW$ ,  $h_{ie} = 1.4 k\Omega$ ,  $h_{fe} = 45$
  - Describe the effect of negative feedback on gain stability, bandwidth, noise, distortion, input & output resistance of feedback amplifier.

**Section - II**

- Q.4 Attempt any four** **16**
- In a transistor Colpitt's oscillator  $L = 100 \mu H$ ,  $C_1 = 0.001 \mu F$ ,  $C_2 = 0.01 \mu F$ . Determine operating frequency, feedback factor and minimum gain to sustain oscillations in the circuit.
  - Explain Direct coupled class A power amplifier, derive the efficiency. How its efficiency can be improved?
  - What is crossover distortion? How it can be avoided? Explain the circuit in detail which is free from this distortion.
  - Explain working and drain characteristics of N channel JFET.
  - Explain working of depletion type MOSFET.

**Q.5 Attempt any two**

- a) Design a transformed coupled Class B push pull amplifier for maximum output voltage of  $6V_{rms}$  at  $4\Omega$  load with transformer efficiency of 75%.  
[Use BC152 with  $V_{CE}=45V$ ,  $I_c=3A$ ,  $h_{fe}=150$ ,  $P_{Dmax}=25$ ]
- b) Explain UJT relaxation oscillator and derive equation for output frequency.
- c) Explain the effect of  $V_{gs}$  and  $V_{ds}$  on Channel conductivity and Drain current  $I_D$

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
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Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) When voltage series negative feedback is applied to an amplifier. its input impedance and output impedance
  - a) Increases, Decreases
  - b) Decreases, Increases
  - c) Remains the same
  - d) Increases, Increases
- 2) In an RC phase shift oscillator, the minimum number of RC networks to be connected in cascade will be \_\_\_\_\_.
  - a) One
  - b) Two
  - c) Three
  - d) Four
- 3) The maximum theoretical efficiency of class B Push pull power amplifier is \_\_\_\_\_.
  - a) 50%
  - b) 62.5%
  - c) 78.5%
  - d) 25%
- 4) Location of Q point is fixed at three locations, namely middle, at cutoff and below cutoff of the amplifier characteristics, then the resulting power amplifier configurations are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ respectively.
  - a) Class B, Class A, Class C
  - b) Class A, Class B, Class C
  - c) Class A, Class AB, Class C
  - d) Class A, Class C, Class AB
- 5) The region in which  $V_{ds} > V_p$  &  $V_{gs} > V_p$  for N channel JFET is called as
  - a) Ohmic region
  - b) Cutoff region
  - c) Pinch off region
  - d) None of these
- 6) JFET operates as Voltage Variable Resistor in \_\_\_\_\_ region.
  - a) Ohmic
  - b) Pinch off
  - c) Active
  - d) none of the these
- 7) MOSFET can be used as \_\_\_\_\_.
  - a) Voltage controlled capacitor
  - b) Voltage controlled inductor
  - c) Current controlled capacitor
  - d) Current controlled inductor

- 8) The transistor biasing circuit which provides least thermal stability is \_\_\_\_\_ bias circuit.
- |                           |                            |
|---------------------------|----------------------------|
| a) Voltage divider        | b) Fixed                   |
| c) Collector to base bias | d) Thermistor compensation |
- 9) Input and output resistance of CC amplifier is \_\_\_\_\_ & \_\_\_\_\_ respectively.
- |               |                |
|---------------|----------------|
| a) Low & low  | b) High & high |
| c) Low & high | d) High & low  |
- 10) H parameter obtained from input characteristics of transistor is \_\_\_\_\_.
- |             |                  |
|-------------|------------------|
| a) $h_{ie}$ | b) $h_{fe}$      |
| c) $h_{oe}$ | d) None of these |
- 11) The slope of DC load line of a transistor CE amplifier is
- |                     |            |
|---------------------|------------|
| a) $-1/(R_c + R_E)$ | b) $1/R_c$ |
| c) $1/R_L$          | d) zero    |
- 12) Cascading two amplifiers will result in \_\_\_\_\_.
- |                                      |
|--------------------------------------|
| a) reduction in gain increase in BW  |
| b) increase in gain decrease in BW   |
| c) reduction in gain reduction in BW |
| d) None of these                     |
- 13) The outstanding characteristic of direct coupled amplifier is \_\_\_\_\_.
- |                            |                          |
|----------------------------|--------------------------|
| a) utmost economy          | b) temperature stability |
| c) amplifies low frequency | d) None of these         |
- 14) When emitter bypass capacitor is removed from RC coupled amplifier circuit it results to
- |                                     |
|-------------------------------------|
| a) voltage series negative feedback |
| b) voltage shunt negative feedback  |
| c) current series negative feedback |
| d) current shunt negative feedback  |

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
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Max. Marks: 56

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 4) Draw neat diagram whenever necessary.

**Section – I**

- Q.2 Attempt any four** **16**
- Obtain H-parameter model & define H parameters for transistor in CB circuit configuration.
  - Explain Q point stabilization in transistor collector to base bias circuit.
  - What is the need of cascading and explain any one coupling schemes along with frequency response?
  - "Input resistance increases and output resistance decreases for voltage series feedback amplifier", Justify the statement.
  - Compare effect of voltage series, current series, current shunt and voltage shunt feedback topologies on amplifier characteristics.
- Q.3 Attempt any two** **12**
- Consider transistor CE amplifier with  $R_L = 1\text{ K}\Omega$ ,  $h_{ie} = 1\text{ K}\Omega$ ,  $h_{re} = 2 \times 10^{-4}$ ,  $h_{fe} = 50$ ,  $h_{oe} = 25\text{ }\mu\text{S}$ ,  $R_s = 800\Omega$ . Calculate  $A_i$ ,  $A_v$ ,  $R_i$ ,  $R_o$
  - Design a single CE amplifier with voltage divider bias for voltage of voltage gain of 40 & output voltage of 4 volt peak and stability factor 10.  
 $P_{D\text{ max.}} = 225\text{ mW}$ ,  $h_{ie} = 1.4\text{ k}\Omega$ ,  $h_{fe} = 45$
  - Describe the effect of negative feedback on gain stability, bandwidth, noise, distortion, input & output resistance of feedback amplifier.

**Section - II**

- Q.4 Attempt any four** **16**
- In a transistor Colpitt's oscillator  $L = 100\text{ }\mu\text{H}$ ,  $C_1 = 0.001\text{ }\mu\text{F}$ ,  $C_2 = 0.01\text{ }\mu\text{F}$ . Determine operating frequency, feedback factor and minimum gain to sustain oscillations in the circuit.
  - Explain Direct coupled class A power amplifier, derive the efficiency. How its efficiency can be improved?
  - What is crossover distortion? How it can be avoided? Explain the circuit in detail which is free from this distortion.
  - Explain working and drain characteristics of N channel JFET.
  - Explain working of depletion type MOSFET.

**Q.5 Attempt any two**

- a) Design a transformed coupled Class B push pull amplifier for maximum output voltage of  $6V_{rms}$  at  $4\Omega$  load with transformer efficiency of 75%.  
[Use BC152 with  $V_{CE}=45V$ ,  $I_c=3A$ ,  $h_{fe}=150$ ,  $P_{Dmax}=25$ ]
- b) Explain UJT relaxation oscillator and derive equation for output frequency.
- c) Explain the effect of  $V_{gs}$  and  $V_{ds}$  on Channel conductivity and Drain current  $I_D$

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Set **R**

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
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Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) Location of Q point is fixed at three locations, namely middle, at cutoff and below cutoff of the amplifier characteristics, then the resulting power amplifier configurations are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ respectively.
  - a) Class B, Class A, Class C
  - b) Class A, Class B, Class C
  - c) Class A, Class AB, Class C
  - d) Class A, Class C, Class AB
- 2) The region in which  $V_{ds} > V_p$  &  $V_{gs} > V_p$  for N channel JFET is called as
  - a) Ohmic region
  - b) Cutoff region
  - c) Pinch off region
  - d) None of these
- 3) JFET operates as Voltage Variable Resistor in \_\_\_\_\_ region.
  - a) Ohmic
  - b) Pinch off
  - c) Active
  - d) none of the these
- 4) MOSFET can be used as \_\_\_\_\_.
  - a) Voltage controlled capacitor
  - b) Voltage controlled inductor
  - c) Current controlled capacitor
  - d) Current controlled inductor
- 5) The transistor biasing circuit which provides least thermal stability is \_\_\_\_\_ bias circuit.
  - a) Voltage divider
  - b) Fixed
  - c) Collector to base bias
  - d) Thermistor compensation
- 6) Input and output resistance of CC amplifier is \_\_\_\_\_ & \_\_\_\_\_ respectively.
  - a) Low & low
  - b) High & high
  - c) Low & high
  - d) High & low
- 7) H parameter obtained from input characteristics of transistor is \_\_\_\_\_.
  - a)  $h_{ie}$
  - b)  $h_{fe}$
  - c)  $h_{oe}$
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- 8) The slope of DC load line of a transistor CE amplifier is
  - a)  $-1/(R_c + R_E)$
  - b)  $1/R_c$
  - c)  $1/R_L$
  - d) zero



- 9) Cascading two amplifiers will result in \_\_\_\_\_.  
a) reduction in gain increase in BW  
b) increase in gain decrease in BW  
c) reduction in gain reduction in BW  
d) None of these
- 10) The outstanding characteristic of direct coupled amplifier is \_\_\_\_\_.  
a) utmost economy  
b) temperature stability  
c) amplifies low frequency  
d) None of these
- 11) When emitter bypass capacitor is removed from RC coupled amplifier circuit it results to  
a) voltage series negative feedback  
b) voltage shunt negative feedback  
c) current series negative feedback  
d) current shunt negative feedback
- 12) When voltage series negative feedback is applied to an amplifier. its input impedance and output impedance  
a) Increases, Decreases  
b) Decreases, Increases  
c) Remains the same  
d) Increases, Increases
- 13) In an RC phase shift oscillator, the minimum number of RC networks to be connected in cascade will be \_\_\_\_\_.  
a) One  
b) Two  
c) Three  
d) Four
- 14) The maximum theoretical efficiency of class B Push pull power amplifier is \_\_\_\_\_.  
a) 50%  
b) 62.5%  
c) 78.5%  
d) 25%

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Max. Marks: 56

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**Section – I**

- Q.2 Attempt any four** **16**
- Obtain H-parameter model & define H parameters for transistor in CB circuit configuration.
  - Explain Q point stabilization in transistor collector to base bias circuit.
  - What is the need of cascading and explain any one coupling schemes along with frequency response?
  - "Input resistance increases and output resistance decreases for voltage series feedback amplifier", Justify the statement.
  - Compare effect of voltage series, current series, current shunt and voltage shunt feedback topologies on amplifier characteristics.
- Q.3 Attempt any two** **12**
- Consider transistor CE amplifier with  $R_L = 1\text{ K}\Omega$ ,  $h_{ie} = 1\text{ K}\Omega$ ,  $h_{re} = 2 \times 10^{-4}$ ,  $h_{fe} = 50$ ,  $h_{oe} = 25\text{ }\mu\text{S}$ ,  $R_s = 800\Omega$ . Calculate  $A_i$ ,  $A_v$ ,  $R_i$ ,  $R_o$
  - Design a single CE amplifier with voltage divider bias for voltage of voltage gain of 40 & output voltage of 4 volt peak and stability factor 10.  
 $P_{D\text{ max.}} = 225\text{ mW}$ ,  $h_{ie} = 1.4\text{ k}\Omega$ ,  $h_{fe} = 45$
  - Describe the effect of negative feedback on gain stability, bandwidth, noise, distortion, input & output resistance of feedback amplifier.

**Section - II**

- Q.4 Attempt any four** **16**
- In a transistor Colpitt's oscillator  $L = 100\text{ }\mu\text{H}$ ,  $C_1 = 0.001\text{ }\mu\text{F}$ ,  $C_2 = 0.01\text{ }\mu\text{F}$ . Determine operating frequency, feedback factor and minimum gain to sustain oscillations in the circuit.
  - Explain Direct coupled class A power amplifier, derive the efficiency. How its efficiency can be improved?
  - What is crossover distortion? How it can be avoided? Explain the circuit in detail which is free from this distortion.
  - Explain working and drain characteristics of N channel JFET.
  - Explain working of depletion type MOSFET.

**Q.5 Attempt any two**

- a) Design a transformed coupled Class B push pull amplifier for maximum output voltage of 6Vrms at  $4\Omega$  load with transformer efficiency of 75%.  
[Use BC152 with  $V_{CE}=45V$ ,  $I_c=3A$ ,  $h_{fe}=150$ ,  $P_{Dmax}=25$ ]
- b) Explain UJT relaxation oscillator and derive equation for output frequency.
- c) Explain the effect of  $V_{gs}$  and  $V_{ds}$  on Channel conductivity and Drain current  $I_D$

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- 8) JFET operates as Voltage Variable Resistor in \_\_\_\_\_ region.
  - a) Ohmic
  - b) Pinch off
  - c) Active
  - d) none of the these
- 9) MOSFET can be used as \_\_\_\_\_.
  - a) Voltage controlled capacitor
  - b) Voltage controlled inductor
  - c) Current controlled capacitor
  - d) Current controlled inductor
- 10) The transistor biasing circuit which provides least thermal stability is \_\_\_\_\_ bias circuit.
  - a) Voltage divider
  - b) Fixed
  - c) Collector to base bias
  - d) Thermistor compensation
- 11) Input and output resistance of CC amplifier is \_\_\_\_\_ & \_\_\_\_\_ respectively.
  - a) Low & low
  - b) High & high
  - c) Low & high
  - d) High & low
- 12) H parameter obtained from input characteristics of transistor is \_\_\_\_\_.
  - a)  $h_{ie}$
  - b)  $h_{fe}$
  - c)  $h_{oe}$
  - d) None of these
- 13) The slope of DC load line of a transistor CE amplifier is
  - a)  $-1 / (R_C + R_E)$
  - b)  $1 / R_C$
  - c)  $1 / R_L$
  - d) zero
- 14) Cascading two amplifiers will result in \_\_\_\_\_.
  - a) reduction in gain increase in BW
  - b) increase in gain decrease in BW
  - c) reduction in gain reduction in BW
  - d) None of these

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**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Electronic Circuit Analysis and Design**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.  
 4) Draw neat diagram whenever necessary.

**Section – I**

- Q.2 Attempt any four** **16**
- Obtain H-parameter model & define H parameters for transistor in CB circuit configuration.
  - Explain Q point stabilization in transistor collector to base bias circuit.
  - What is the need of cascading and explain any one coupling schemes along with frequency response?
  - "Input resistance increases and output resistance decreases for voltage series feedback amplifier", Justify the statement.
  - Compare effect of voltage series, current series, current shunt and voltage shunt feedback topologies on amplifier characteristics.
- Q.3 Attempt any two** **12**
- Consider transistor CE amplifier with  $R_L = 1\text{ K}\Omega$ ,  $h_{ie} = 1\text{ K}\Omega$ ,  $h_{re} = 2 \times 10^{-4}$ ,  $h_{fe} = 50$ ,  $h_{oe} = 25\text{ }\mu\text{S}$ ,  $R_s = 800\Omega$ . Calculate  $A_i$ ,  $A_v$ ,  $R_i$ ,  $R_o$
  - Design a single CE amplifier with voltage divider bias for voltage of voltage gain of 40 & output voltage of 4 volt peak and stability factor 10.  
 $P_{D\text{ max.}} = 225\text{ mW}$ ,  $h_{ie} = 1.4\text{ k}\Omega$ ,  $h_{fe} = 45$
  - Describe the effect of negative feedback on gain stability, bandwidth, noise, distortion, input & output resistance of feedback amplifier.

**Section - II**

- Q.4 Attempt any four** **16**
- In a transistor Colpitt's oscillator  $L = 100\text{ }\mu\text{H}$ ,  $C_1 = 0.001\text{ }\mu\text{F}$ ,  $C_2 = 0.01\text{ }\mu\text{F}$ . Determine operating frequency, feedback factor and minimum gain to sustain oscillations in the circuit.
  - Explain Direct coupled class A power amplifier, derive the efficiency. How its efficiency can be improved?
  - What is crossover distortion? How it can be avoided? Explain the circuit in detail which is free from this distortion.
  - Explain working and drain characteristics of N channel JFET.
  - Explain working of depletion type MOSFET.

**Q.5 Attempt any two**

- a) Design a transformed coupled Class B push pull amplifier for maximum output voltage of  $6V_{rms}$  at  $4\Omega$  load with transformer efficiency of 75%.  
[Use BC152 with  $V_{CE}=45V$ ,  $I_c=3A$ ,  $h_{fe}=150$ ,  $P_{Dmax}=25$ ]
- b) Explain UJT relaxation oscillator and derive equation for output frequency.
- c) Explain the effect of  $V_{gs}$  and  $V_{ds}$  on Channel conductivity and Drain current  $I_D$

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) For maximum transfer of power the source resistance must be \_\_\_\_\_.  
 a) Greater than load resistance      b) less than load resistance  
 c) Equal to load resistance      d) None of the above
- 2) The Thevenin's circuit can be obtained by making the load resistance as \_\_\_\_\_.  
 a) Open Circuit      b) Short Circuit  
 c) Equal to source resistance      d) Less than source resistance
- 3) What would be the value of impedance of a parallel resonant circuit at anti resonance condition?  
 a) Reactive & minimum      b) Resistive & minimum  
 c) Reactive & maximum      d) Resistive & maximum
- 4) If the value of Quality factor is 100 in a series RLC circuit along with the bandwidth of about 1 kHz, then what would be the value of resonance frequency?  
 a) 5 kHz      b) 50 kHz  
 c) 100 kHz      d) None of these
- 5) In a certain series resonant circuit,  $V_C = 250V$ ,  $V_L = 250V$ , and  $V_R = 100V$ . The value of the source voltage is \_\_\_\_\_.  
 a) 100V      b) 125V  
 c) 40V      d) 250V
- 6) How is the output admittance ( $h_{22}$ ) calculated?  
 a)  $V_2 / I_1$  (keeping  $I_2 = 0$ )      b)  $I_2 / V_1$  (keeping  $V_2 = 0$ )  
 c)  $I_2 / V_2$  (keeping  $I_1 = 0$ )      d)  $V_1 / I_2$  (keeping  $I_1 = 0$ )
- 7) In RC series circuit  $R = 50\Omega$ ,  $C = 20\mu F$  and 100V dc is applied. Then what is the value of current at steady state?  
 a) 20 A      b) 2 A  
 c) 0 A      d) 10 A
- 8) Which elements act as dependent variables in Y-parameters?  
 a) Current      b) Voltage  
 c) Both a and b      d) None of the above



- 9) Transients are present in the circuit when the circuit is having \_\_\_\_\_.
  - a) C
  - b) L
  - c) R
  - d) Either L or C
- 10) Time constant of RC series circuit is \_\_\_\_\_.
  - a)  $2C/R$
  - b) RC
  - c)  $C/2R$
  - d)  $R/C$
- 11) A band elimination filter is one which \_\_\_\_\_.
  - a) Attenuates all frequencies less than lower cut off frequency
  - b) Attenuates all frequencies greater than lower cut off frequency
  - c) Attenuates all frequencies between lower and higher cut off frequency
  - d) None of the above
- 12) An ideal high pass filter is one which \_\_\_\_\_.
  - a) Zero attenuation for all frequencies less than cut off frequency
  - b) Infinite attenuation for all frequencies
  - c) No attenuation for all frequencies greater than cut off frequency
  - d) None of the above
- 13) The driving point admittance is defined as \_\_\_\_\_.
  - a) ratio of transform current to transform voltage at same port
  - b) Ratio of transform voltage at one port to transform current at other port
  - c) Both a and b
  - d) None of the above
- 14) If attenuation in dB is 60, then in Neper it is \_\_\_\_\_.
  - a) 10
  - b) 100
  - c) 1000
  - d) None of the above

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Friday, 17-03-2023  
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Max. Marks: 56

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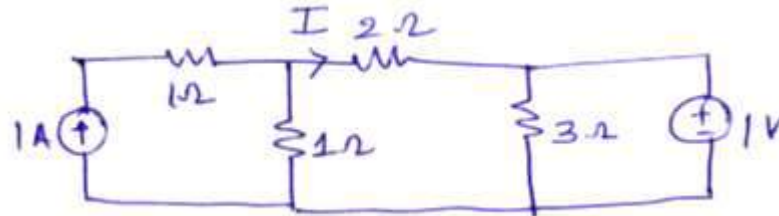
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Figure 1

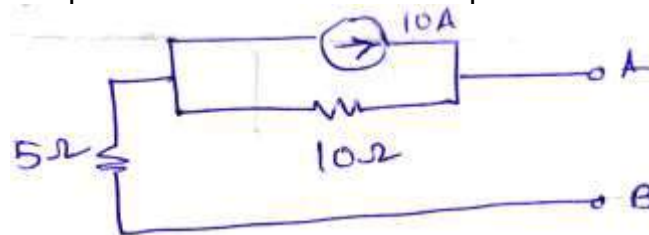
**b)** Find the Norton equivalent circuit between the points A and B in figure 2?

Figure 2

- c)** A  $50\mu\text{F}$ , when connected in series with a coil having  $40\Omega$  resistance, resonates at  $1000\text{Hz}$ . Find the inductance of the coil. Also obtain the Maximum current if the applied voltage is  $100\text{V}$ .
- d)** Derive h-parameters for two port network in terms of voltage, current and draw h-parameter equivalent circuit.
- e)** Find Y-parameters for the network shown in figure 3

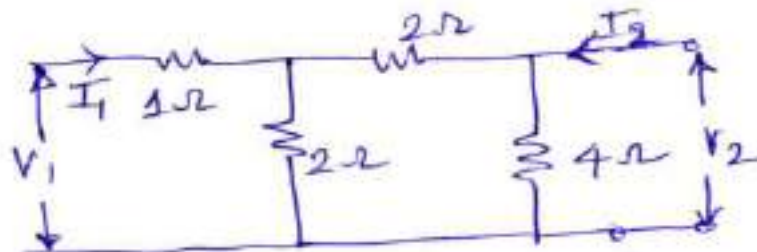


Figure 3

**Q.3 Attempt any two questions.**

- a) Find the value of  $R$  in figure 4 for which maximum power transfer takes place and hence find the maximum power delivered to  $R$ ?

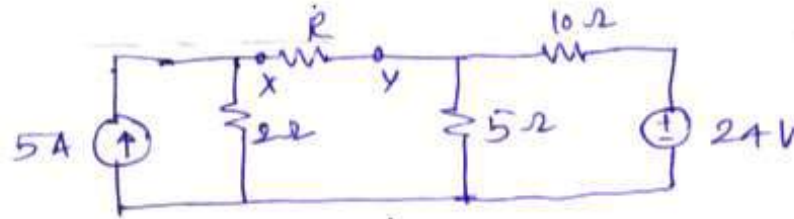


Figure 4

- b) Derive the expression for frequency at which the Voltage across Inductor will be maximum in series resonance circuit.  
 c) Determine Z parameters for T type network shown in figure 5.

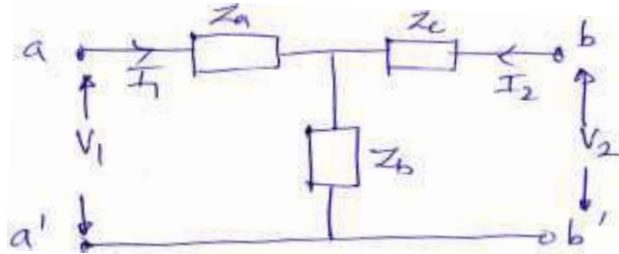
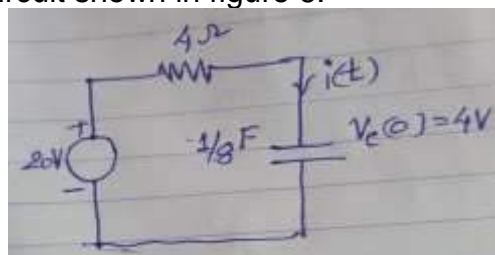


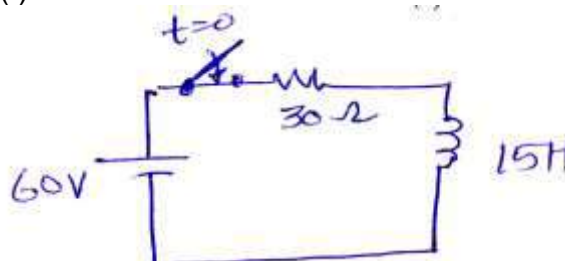
Figure 5

**Section II****Q.4 Attempt any four questions.**

- a) Determine the current  $i(t)$  for  $t \geq 0$  if initial voltage on capacitor  $V_C(t) = 4V$  for the circuit shown in figure 6.



- b) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of  $500\Omega$  impedance.  
 c) Plot the pole zero diagram for  $H(s) = 2s / [(s+2)(s^2+2s+2)]$   
 d) Design a k-type high-pass filter (T and  $\pi$ ) with a cut-off frequency of 1kHz with a terminated design impedance of  $800\Omega$ .  
 e) A series RL circuit with  $R=30\Omega$  and  $L=15H$  has a constant voltage  $V=60V$  applied at  $t=0$  as shown in figure 7. Determine the current  $i(t)$  and the voltage  $v(t)$  across the resistance.



**Q.5 Answer any two questions.**

- a)** Explain the concept of complex frequency and significance of poles and zeros.
- b)** Derive the expression for step response (current) for series RL circuit. Also derive the expression for time constant.
- c)** Design a k-type band pass T and  $\pi$  type filter having a design impedance of  $500\Omega$  and cut-off frequencies 1kHz and 10 kHz.

## Q

## Max. Marks: 70

Marks: 14

14

- Page 6 of 20

- 9) The Thevenin's circuit can be obtained by making the load resistance as \_\_\_\_\_.  
a) Open Circuit                      b) Short Circuit  
c) Equal to source resistance       d) Less than source resistance
- 10) What would be the value of impedance of a parallel resonant circuit at anti resonance condition?  
a) Reactive & minimum            b) Resistive & minimum  
c) Reactive & maximum            d) Resistive & maximum
- 11) If the value of Quality factor is 100 in a series RLC circuit along with the bandwidth of about 1 kHz, then what would be the value of resonance frequency?  
a) 5 kHz                                  b) 50 kHz  
c) 100 kHz                                d) None of these
- 12) In a certain series resonant circuit,  $V_C = 250V$ ,  $V_L = 250V$ , and  $V_R = 100V$ . The value of the source voltage is \_\_\_\_\_.  
a) 100V                                    b) 125V  
c) 40V                                     d) 250V
- 13) How is the output admittance ( $h_{22}$ ) calculated?  
a)  $V_2 / I_1$  (keeping  $I_2 = 0$ )        b)  $I_2 / V_1$  (keeping  $V_2 = 0$ )  
c)  $I_2 / V_2$  (keeping  $I_1 = 0$ )        d)  $V_1 / I_2$  (keeping  $I_1 = 0$ )
- 14) In RC series circuit  $R = 50\Omega$ ,  $C = 20\mu F$  and 100V dc is applied. Then what is the value of current at steady state?  
a) 20 A                                    b) 2 A  
c) 0 A                                     d) 10 A

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Set **Q**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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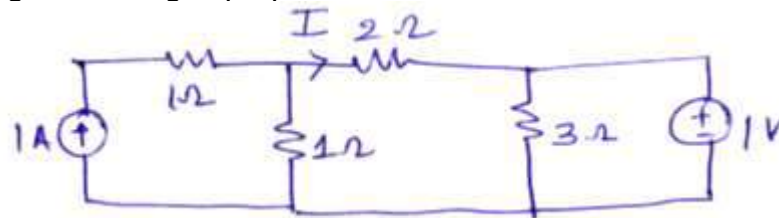
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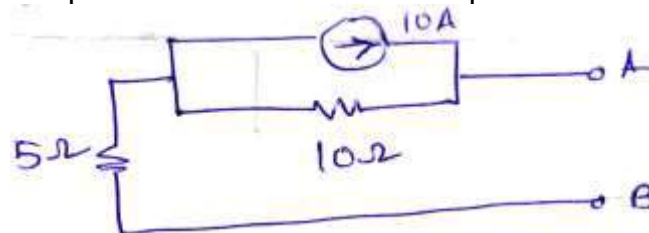
**b)** Find the Norton equivalent circuit between the points A and B in figure 2?

Figure 2

- c)** A  $50\mu\text{F}$ , when connected in series with a coil having  $40\Omega$  resistance, resonates at  $1000\text{Hz}$ . Find the inductance of the coil. Also obtain the Maximum current if the applied voltage is  $100\text{V}$ .
- d)** Derive h-parameters for two port network in terms of voltage, current and draw h-parameter equivalent circuit.
- e)** Find Y-parameters for the network shown in figure 3

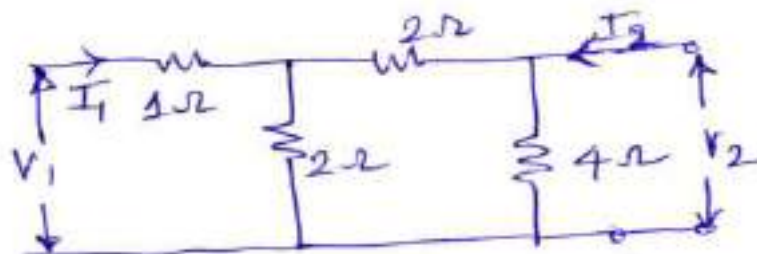


Figure 3

**Q.3 Attempt any two questions.**

- a) Find the value of  $R$  in figure 4 for which maximum power transfer takes place and hence find the maximum power delivered to  $R$ ?

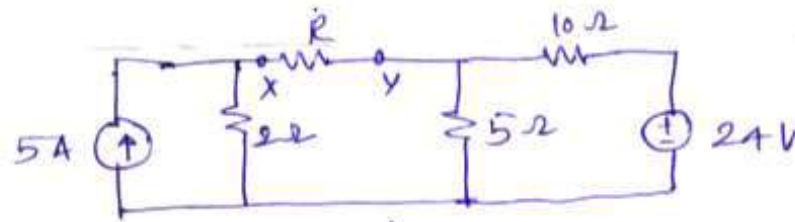


Figure 4

- b) Derive the expression for frequency at which the Voltage across Inductor will be maximum in series resonance circuit.  
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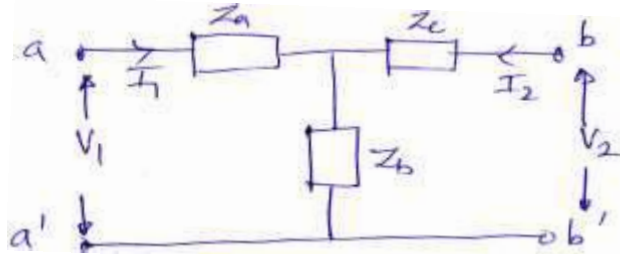
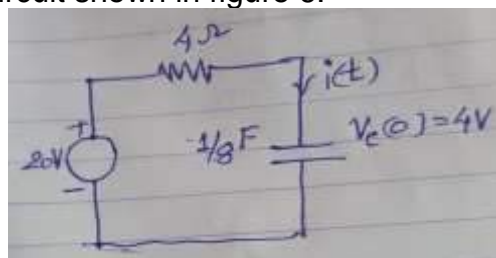


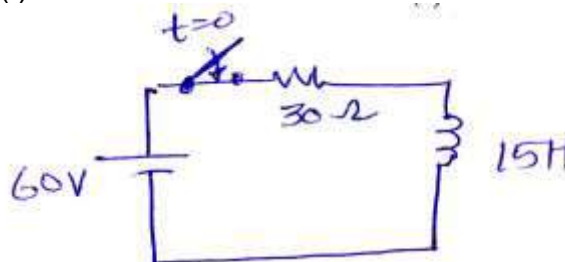
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**Section II****Q.4 Attempt any four questions.**

- a) Determine the current  $i(t)$  for  $t \geq 0$  if initial voltage on capacitor  $V_c(t) = 4V$  for the circuit shown in figure 6.



- b) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of  $500\Omega$  impedance.  
 c) Plot the pole zero diagram for  $H(s) = 2s / [(s+2)(s^2+2s+2)]$   
 d) Design a k-type high-pass filter (T and  $\pi$ ) with a cut-off frequency of 1kHz with a terminated design impedance of  $800\Omega$ .  
 e) A series RL circuit with  $R=30\Omega$  and  $L=15H$  has a constant voltage  $V=60V$  applied at  $t=0$  as shown in figure 7. Determine the current  $i(t)$  and the voltage  $v(t)$  across the resistance.





**Q.5 Answer any two questions.**

- a)** Explain the concept of complex frequency and significance of poles and zeros.
- b)** Derive the expression for step response (current) for series RL circuit. Also derive the expression for time constant.
- c)** Design a k-type band pass T and  $\pi$  type filter having a design impedance of  $500\Omega$  and cut-off frequencies 1kHz and 10 kHz.

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Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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Marks: 14

14

- Page 11 of 20

- 8) If the value of Quality factor is 100 in a series RLC circuit along with the bandwidth of about 1 kHz, then what would be the value of resonance frequency?  
a) 5 kHz  
b) 50 kHz  
c) 100 kHz  
d) None of these
- 9) In a certain series resonant circuit,  $V_C = 250V$ ,  $V_L = 250V$ , and  $V_R = 100V$ . The value of the source voltage is \_\_\_\_\_.  
a) 100V  
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- 10) How is the output admittance ( $h_{22}$ ) calculated?  
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a) 20 A  
b) 2 A  
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- 12) Which elements act as dependent variables in Y-parameters?  
a) Current  
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c) Both a and b  
d) None of the above
- 13) Transients are present in the circuit when the circuit is having \_\_\_\_\_.  
a) C  
b) L  
c) R  
d) Either L or C
- 14) Time constant of RC series circuit is \_\_\_\_\_.  
a)  $2C/R$   
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c)  $C/2R$   
d)  $R/C$

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Set **R**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Friday, 17-03-2023  
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Max. Marks: 56

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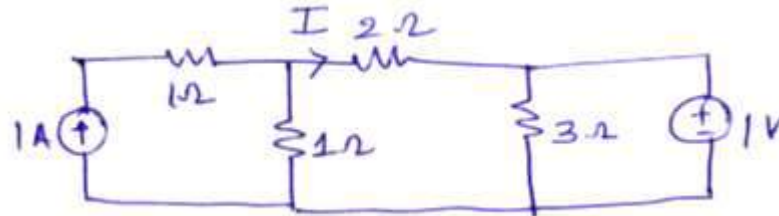
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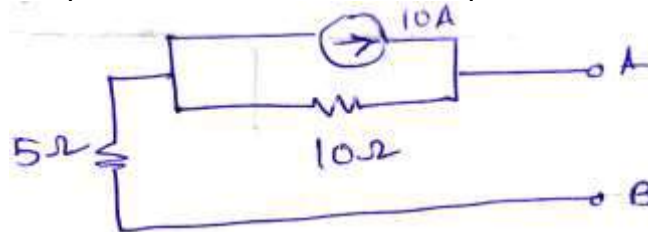
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Figure 2

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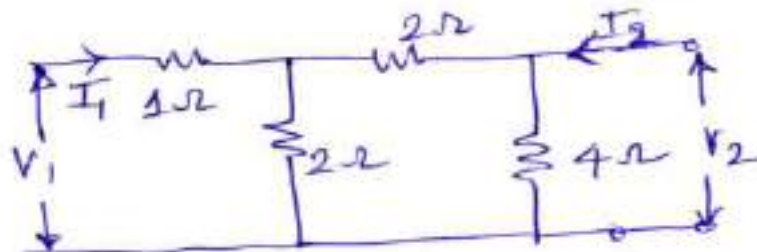


Figure 3

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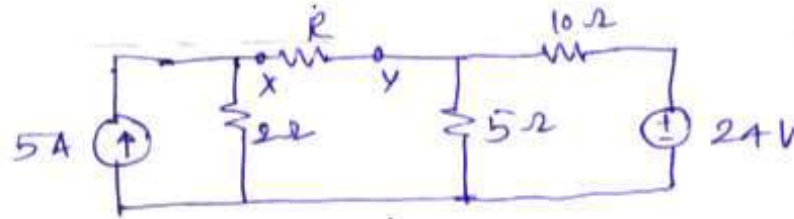


Figure 4

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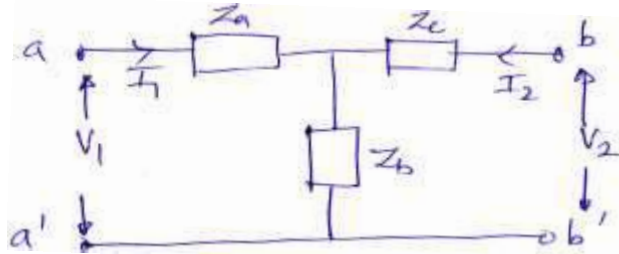
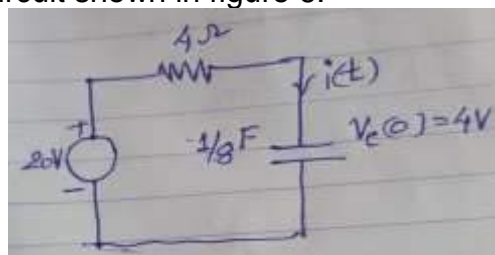


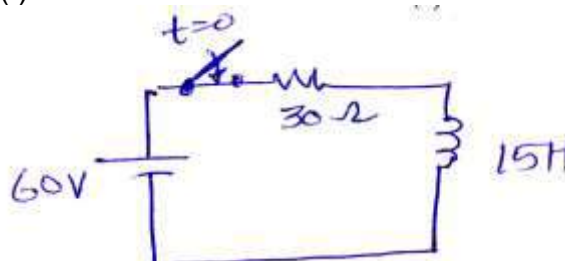
Figure 5

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Friday, 17-03-2023  
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Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) How is the output admittance ( $h_{22}$ ) calculated?
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  - b)  $I_2 / V_1$  (keeping  $V_2 = 0$ )
  - c)  $I_2 / V_2$  (keeping  $I_1 = 0$ )
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  - c) Attenuates all frequencies between lower and higher cut off frequency
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  - c) No attenuation for all frequencies greater than cut off frequency
  - d) None of the above

- 8) The driving point admittance is defined as \_\_\_\_\_.  
a) ratio of transform current to transform voltage at same port  
b) Ratio of transform voltage at one port to transform current at other port  
c) Both a and b  
d) None of the above
- 9) If attenuation in dB is 60, then in Neper it is \_\_\_\_\_.  
a) 10  
b) 100  
c) 1000  
d) None of the above
- 10) For maximum transfer of power the source resistance must be \_\_\_\_\_.  
a) Greater than load resistance  
b) less than load resistance  
c) Equal to load resistance  
d) None of the above
- 11) The Thevenin's circuit can be obtained by making the load resistance as \_\_\_\_\_.  
a) Open Circuit  
b) Short Circuit  
c) Equal to source resistance  
d) Less than source resistance
- 12) What would be the value of impedance of a parallel resonant circuit at anti resonance condition?  
a) Reactive & minimum  
b) Resistive & minimum  
c) Reactive & maximum  
d) Resistive & maximum
- 13) If the value of Quality factor is 100 in a series RLC circuit along with the bandwidth of about 1 kHz, then what would be the value of resonance frequency?  
a) 5 kHz  
b) 50 kHz  
c) 100 kHz  
d) None of these
- 14) In a certain series resonant circuit,  $V_C = 250V$ ,  $V_L = 250V$ , and  $V_R = 100V$ . The value of the source voltage is \_\_\_\_\_.  
a) 100V  
b) 125V  
c) 40V  
d) 250V



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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Network Theory and Analysis**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

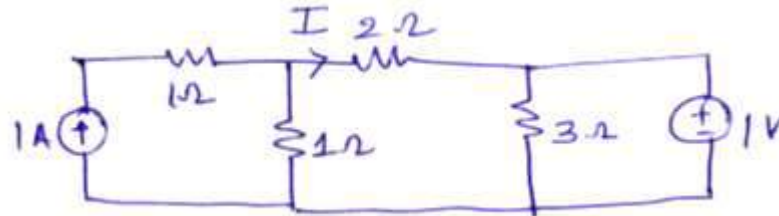
**Section – I****Q.2 Answer any four of the following questions.****16****a)** Find  $I$  in figure 1 using superposition theorem?

Figure 1

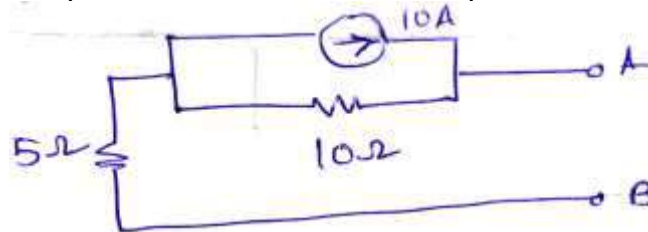
**b)** Find the Norton equivalent circuit between the points A and B in figure 2?

Figure 2

- c)** A  $50\mu\text{F}$ , when connected in series with a coil having  $40\Omega$  resistance, resonates at  $1000\text{Hz}$ . Find the inductance of the coil. Also obtain the Maximum current if the applied voltage is  $100\text{V}$ .
- d)** Derive h-parameters for two port network in terms of voltage, current and draw h-parameter equivalent circuit.
- e)** Find Y-parameters for the network shown in figure 3

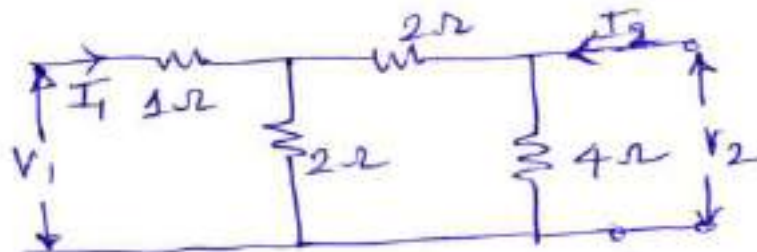


Figure 3

**Q.3 Attempt any two questions.**

- a) Find the value of  $R$  in figure 4 for which maximum power transfer takes place and hence find the maximum power delivered to  $R$ ?

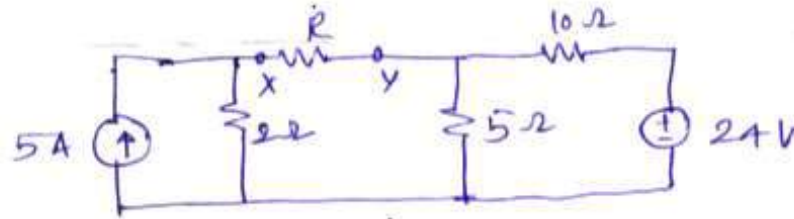


Figure 4

- b) Derive the expression for frequency at which the Voltage across Inductor will be maximum in series resonance circuit.  
 c) Determine Z parameters for T type network shown in figure 5.

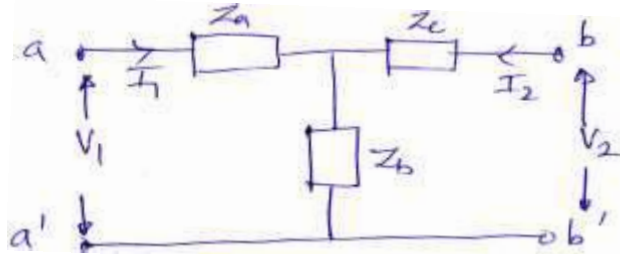
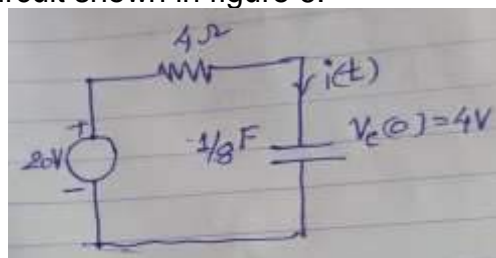


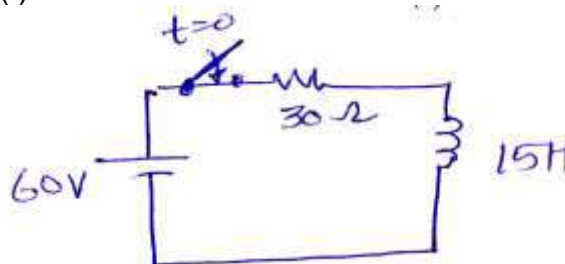
Figure 5

**Section II****Q.4 Attempt any four questions.**

- a) Determine the current  $i(t)$  for  $t \geq 0$  if initial voltage on capacitor  $V_c(t) = 4V$  for the circuit shown in figure 6.



- b) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of  $500\Omega$  impedance.  
 c) Plot the pole zero diagram for  $H(s) = 2s / [(s+2)(s^2+2s+2)]$   
 d) Design a k-type high-pass filter (T and  $\pi$ ) with a cut-off frequency of 1kHz with a terminated design impedance of  $800\Omega$ .  
 e) A series RL circuit with  $R=30\Omega$  and  $L=15H$  has a constant voltage  $V=60V$  applied at  $t=0$  as shown in figure 7. Determine the current  $i(t)$  and the voltage  $v(t)$  across the resistance.



**Q.5 Answer any two questions.**

- a)** Explain the concept of complex frequency and significance of poles and zeros.
- b)** Derive the expression for step response (current) for series RL circuit. Also derive the expression for time constant.
- c)** Design a k-type band pass T and  $\pi$  type filter having a design impedance of  $500\Omega$  and cut-off frequencies 1kHz and 10 kHz.

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Max. Marks: 70

Marks: 14

14

- 1) For each cell, no. of adjacent cell on a 4-variable K-map is \_\_\_\_\_.  
a) 2                                      b) 4  
c) 3                                      d) 8
- 2) The following binary system is used for K-map representation \_\_\_\_\_.  
a) Binary                                b) BCD  
c) Gray                                  d) hexadecimal
- 3) A half adder has \_\_\_\_\_.  
a) 1 input & 2 outputs                b) 2 input & 2 outputs  
c) 2 input & 1 outputs                 d) 3 input & 2 outputs
- 4) A Multiplexer is also known as \_\_\_\_\_.  
a) Counter                                b) Decoder  
c) Data selector                          d) None of these
- 5) The fan out of TTL logic is about \_\_\_\_\_.  
a) 5                                        b) 10  
c) 20                                       d) 50
- 6) When both inputs of JK flip-flop are 1, then the next state is \_\_\_\_\_.  
a) 0                                        b) 1  
c) Q(n)                                    d) [Q(n)]'
- 7) The characteristic equation of T flip-flop is given by, \_\_\_\_\_.  
a)  $Q = T'Q' + T'Q$                       b)  $Q = T'Q' + TQ$   
c)  $Q = TQ' + T'Q$                       d)  $Q = TQ$
- 8) Asynchronous counters are known as \_\_\_\_\_.  
a) ripple counter                        b) multiple clock counter  
c) decade counter                      d) modulus of counter
- 9) How many clock pulses are required to completely load serially a 5 bit shift register?  
a) 2                                        b) 3  
c) 4                                        d) 5

- 10) Ring and Johnson counters are \_\_\_\_\_.
  - a) Synchronous counters
  - b) Asynchronous counters
  - c) True binary counters
  - d) Synchronous and true binary counters
- 11) The MOD number of counter is \_\_\_\_\_.
  - a) maximum possible number of states
  - b) actual number of states in a sequence
  - c) number of flip-flop
  - d) none
- 12) The output of a mod-2 counter given as a clock input of a MOD-5 counter gives a \_\_\_\_\_.
  - a) Mod-5 counter
  - b) MOD-10 counter
  - c) MOD-25 counter
  - d) None of these
- 13) The state table is the pictorial representation among \_\_\_\_\_.
  - a) present states
  - b) next states
  - c) i/p & o/p
  - d) all of these
- 14) The output of the Mealy machine is the function of \_\_\_\_\_.
  - a) next state
  - b) present inputs
  - c) present state and present inputs
  - d) present state

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Digital Techniques**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 16**

- Reduce given function using K-map and implement it using NAND gate only  
 $f(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 11)$
- Explain the terms:
  - SOP
  - POS
- What is subtractor? Explain full subtractor with design.
- Design & explain 2-bit magnitude comparator.
- Explain the various characteristics of logic families.

**Q.3 Answer the following question. (Any Two) 12**

- Reduce following function using Quine McClusky method.  
 $f(A, B, C, D) = \sum m(0, 1, 3, 7, 8, 9, 11, 15)$
- Implement the following function using single 8:1 MUX.  
 $f(A, B, C, D) = \sum m(0, 1, 3, 4, 8, 9, 15)$
- Convert
  - JK flip-flop to D flip-flop
  - JK flip-flop to T flip-flop

**Section – II**

**Q.4 Answer the following question. (Any Four) 16**

- What are different modes of operation of shift register? Explain any one of it.
- Explain 5 bit ring counter.
- Design 4-bit asynchronous down counter and explain it with waveforms.
- Design divide-by-6 counter using IC7490.
- Compare synchronous and asynchronous sequential circuit.

**Q.5 Answer the following question. (Any Two) 12**

- Explain bidirectional shift register.
- Design MOD 10 synchronous up counter using JK flip flop.
- Explain state diagram, state table and draw Moore, Mealy state diagram for D flip-flop.

**Seat  
No.**

Max. Marks: 70

Marks: 14

14

- Page 4 of 12

- 8) For each cell, no. of adjacent cell on a 4-variable K-map is \_\_\_\_\_.  
a) 2                                      b) 4  
c) 3                                      d) 8
- 9) The following binary system is used for K-map representation \_\_\_\_\_.  
a) Binary                                  b) BCD  
c) Gray                                    d) hexadecimal
- 10) A half adder has \_\_\_\_\_.  
a) 1 input & 2 outputs                 b) 2 input & 2 outputs  
c) 2 input & 1 outputs                 d) 3 input & 2 outputs
- 11) A Multiplexer is also known as \_\_\_\_\_.  
a) Counter                                b) Decoder  
c) Data selector                          d) None of these
- 12) The fan out of TTL logic is about \_\_\_\_\_.  
a) 5                                          b) 10  
c) 20                                        d) 50
- 13) When both inputs of JK flip-flop are 1, then the next state is \_\_\_\_\_.  
a) 0                                          b) 1  
c) Q(n)                                    d) [Q(n)]'
- 14) The characteristic equation of T flip-flop is given by, \_\_\_\_\_.  
a)  $Q = T'Q' + T'Q$                       b)  $Q = T'Q' + TQ$   
c)  $Q = TQ' + T'Q$                       d)  $Q = TQ$



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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Digital Techniques**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 16**

- Reduce given function using K-map and implement it using NAND gate only  
 $f(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 11)$
- Explain the terms:
  - SOP
  - POS
- What is subtractor? Explain full subtractor with design.
- Design & explain 2-bit magnitude comparator.
- Explain the various characteristics of logic families.

**Q.3 Answer the following question. (Any Two) 12**

- Reduce following function using Quine McClusky method.  
 $f(A, B, C, D) = \sum m(0, 1, 3, 7, 8, 9, 11, 15)$
- Implement the following function using single 8:1 MUX.  
 $f(A, B, C, D) = \sum m(0, 1, 3, 4, 8, 9, 15)$
- Convert
  - JK flip-flop to D flip-flop
  - JK flip-flop to T flip-flop

**Section – II**

**Q.4 Answer the following question. (Any Four) 16**

- What are different modes of operation of shift register? Explain any one of it.
- Explain 5 bit ring counter.
- Design 4-bit asynchronous down counter and explain it with waveforms.
- Design divide-by-6 counter using IC7490.
- Compare synchronous and asynchronous sequential circuit.

**Q.5 Answer the following question. (Any Two) 12**

- Explain bidirectional shift register.
- Design MOD 10 synchronous up counter using JK flip flop.
- Explain state diagram, state table and draw Moore, Mealy state diagram for D flip-flop.

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Set **R**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Digital Techniques**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The MOD number of counter is \_\_\_\_\_.  
 a) maximum possible number of states  
 b) actual number of states in a sequence  
 c) number of flip-flop  
 d) none
- 2) The output of a mod-2 counter given as a clock input of a MOD-5 counter gives a \_\_\_\_\_.  
 a) Mod-5 counter  
 b) MOD-10 counter  
 c) MOD-25 counter  
 d) None of these
- 3) The state table is the pictorial representation among \_\_\_\_\_.  
 a) present states  
 b) next states  
 c) i/p & o/p  
 d) all of these
- 4) The output of the Mealy machine is the function of \_\_\_\_\_.  
 a) next state  
 b) present inputs  
 c) present state and present inputs  
 d) present state
- 5) For each cell, no. of adjacent cell on a 4-variable K-map is \_\_\_\_\_.  
 a) 2  
 b) 4  
 c) 3  
 d) 8
- 6) The following binary system is used for K-map representation \_\_\_\_\_.  
 a) Binary  
 b) BCD  
 c) Gray  
 d) hexadecimal
- 7) A half adder has \_\_\_\_\_.  
 a) 1 input & 2 outputs  
 b) 2 input & 2 outputs  
 c) 2 input & 1 outputs  
 d) 3 input & 2 outputs
- 8) A Multiplexer is also known as \_\_\_\_\_.  
 a) Counter  
 b) Decoder  
 c) Data selector  
 d) None of these

- 9) The fan out of TTL logic is about \_\_\_\_\_.  
a) 5  
b) 10  
c) 20  
d) 50
- 10) When both inputs of JK flip-flop are 1, then the next state is \_\_\_\_\_.  
a) 0  
b) 1  
c)  $Q(n)$   
d)  $[Q(n)]'$
- 11) The characteristic equation of T flip-flop is given by, \_\_\_\_\_.  
a)  $Q = T'Q' + T'Q$   
b)  $Q = T'Q' + TQ$   
c)  $Q = TQ' + T'Q$   
d)  $Q = TQ$
- 12) Asynchronous counters are known as \_\_\_\_\_.  
a) ripple counter  
b) multiple clock counter  
c) decade counter  
d) modulus of counter
- 13) How many clock pulses are required to completely load serially a 5 bit shift register?  
a) 2  
b) 3  
c) 4  
d) 5
- 14) Ring and Johnson counters are \_\_\_\_\_.  
a) Synchronous counters  
b) Asynchronous counters  
c) True binary counters  
d) Synchronous and true binary counters

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Set **R**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Digital Techniques**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 16**

- Reduce given function using K-map and implement it using NAND gate only  
 $f(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 11)$
- Explain the terms:
  - SOP
  - POS
- What is subtractor? Explain full subtractor with design.
- Design & explain 2-bit magnitude comparator.
- Explain the various characteristics of logic families.

**Q.3 Answer the following question. (Any Two) 12**

- Reduce following function using Quine McClusky method.  
 $f(A, B, C, D) = \sum m(0, 1, 3, 7, 8, 9, 11, 15)$
- Implement the following function using single 8:1 MUX.  
 $f(A, B, C, D) = \sum m(0, 1, 3, 4, 8, 9, 15)$
- Convert
  - JK flip-flop to D flip-flop
  - JK flip-flop to T flip-flop

**Section – II**

**Q.4 Answer the following question. (Any Four) 16**

- What are different modes of operation of shift register? Explain any one of it.
- Explain 5 bit ring counter.
- Design 4-bit asynchronous down counter and explain it with waveforms.
- Design divide-by-6 counter using IC7490.
- Compare synchronous and asynchronous sequential circuit.

**Q.5 Answer the following question. (Any Two) 12**

- Explain bidirectional shift register.
- Design MOD 10 synchronous up counter using JK flip flop.
- Explain state diagram, state table and draw Moore, Mealy state diagram for D flip-flop.

**Seat  
No.**

Day & Date: Monday, 20-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) When both inputs of JK flip-flop are 1, then the next state is \_\_\_\_\_.  
a) 0  
b) 1  
c)  $Q(n)$   
d)  $[Q(n)]'$
- 2) The characteristic equation of T flip-flop is given by, \_\_\_\_\_.  
a)  $Q = T'Q' + T'Q$   
b)  $Q = T'Q' + TQ$   
c)  $Q = TQ' + T'Q$   
d)  $Q = TQ$
- 3) Asynchronous counters are known as \_\_\_\_\_.  
a) ripple counter  
b) multiple clock counter  
c) decade counter  
d) modulus of counter
- 4) How many clock pulses are required to completely load serially a 5 bit shift register?  
a) 2  
b) 3  
c) 4  
d) 5
- 5) Ring and Johnson counters are \_\_\_\_\_.  
a) Synchronous counters  
b) Asynchronous counters  
c) True binary counters  
d) Synchronous and true binary counters
- 6) The MOD number of counter is \_\_\_\_\_.  
a) maximum possible number of states  
b) actual number of states in a sequence  
c) number of flip-flop  
d) none
- 7) The output of a mod-2 counter given as a clock input of a MOD-5 counter gives a \_\_\_\_\_.  
a) Mod-5 counter  
b) MOD-10 counter  
c) MOD-25 counter  
d) None of these
- 8) The state table is the pictorial representation among \_\_\_\_\_.  
a) present states  
b) next states  
c) i/p & o/p  
d) all of these

- 9) The output of the Mealy machine is the function of \_\_\_\_\_.  
a) next state  
b) present inputs  
c) present state and present inputs  
d) present state
- 10) For each cell, no. of adjacent cell on a 4-variable K-map is \_\_\_\_\_.  
a) 2  
b) 4  
c) 3  
d) 8
- 11) The following binary system is used for K-map representation \_\_\_\_\_.  
a) Binary  
b) BCD  
c) Gray  
d) hexadecimal
- 12) A half adder has \_\_\_\_\_.  
a) 1 input & 2 outputs  
b) 2 input & 2 outputs  
c) 2 input & 1 outputs  
d) 3 input & 2 outputs
- 13) A Multiplexer is also known as \_\_\_\_\_.  
a) Counter  
b) Decoder  
c) Data selector  
d) None of these
- 14) The fan out of TTL logic is about \_\_\_\_\_.  
a) 5  
b) 10  
c) 20  
d) 50

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Set **S**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Digital Techniques**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 16**

- Reduce given function using K-map and implement it using NAND gate only  
 $f(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 11)$
- Explain the terms:
  - SOP
  - POS
- What is subtractor? Explain full subtractor with design.
- Design & explain 2-bit magnitude comparator.
- Explain the various characteristics of logic families.

**Q.3 Answer the following question. (Any Two) 12**

- Reduce following function using Quine McClusky method.  
 $f(A, B, C, D) = \sum m(0, 1, 3, 7, 8, 9, 11, 15)$
- Implement the following function using single 8:1 MUX.  
 $f(A, B, C, D) = \sum m(0, 1, 3, 4, 8, 9, 15)$
- Convert
  - JK flip-flop to D flip-flop
  - JK flip-flop to T flip-flop

**Section – II**

**Q.4 Answer the following question. (Any Four) 16**

- What are different modes of operation of shift register? Explain any one of it.
- Explain 5 bit ring counter.
- Design 4-bit asynchronous down counter and explain it with waveforms.
- Design divide-by-6 counter using IC7490.
- Compare synchronous and asynchronous sequential circuit.

**Q.5 Answer the following question. (Any Two) 12**

- Explain bidirectional shift register.
- Design MOD 10 synchronous up counter using JK flip flop.
- Explain state diagram, state table and draw Moore, Mealy state diagram for D flip-flop.

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Noise is added to a signal in a communication system \_\_\_\_\_.  
 a) At the receiving end  
 b) At transmitting antenna  
 c) In the channel  
 d) During regeneration of the information
- 2) Noise power at the resistor is affected by the value of the resistor as \_\_\_\_\_.  
 a) Directly proportional to the value of the resistor  
 b) Inversely proportional to the value of the resistor  
 c) Unaffected by the value of the resistor  
 d) Becomes half as the resistance value is doubled
- 3) Low frequency noise is \_\_\_\_\_.  
 a) Transit time noise  
 b) Flicker noise  
 c) Shot noise  
 d) None of the above
- 4) Thermal noise is also known as \_\_\_\_\_.  
 a) Johnson noise  
 b) Partition noise  
 c) Flicker noise  
 d) Solar noise
- 5) Modulation is the process of \_\_\_\_\_.  
 a) generating constant-frequency radio waves  
 b) combining audio and radio-frequency waves at the transmitting end of a communication system  
 c) reducing distortion in RF amplifiers  
 d) improving thermal stability of a transistor
- 6) As compared to DSB-FC, 100% modulated transmission, power saving in SSB-SC system is \_\_\_\_\_ percent.  
 a) 94.4  
 b) 85  
 c) 100  
 d) 83.3
- 7) Pilot-carrier transmission is one in which \_\_\_\_\_.  
 a) only one sideband is transmitted  
 b) one sidebands and carrier are transmitted  
 c) only two sidebands are transmitted  
 d) two sidebands as well as a trace of carrier are transmitted



- 8) Vestigial sideband (VSB) transmission is exclusively used for \_\_\_\_\_.  
a) HF mobile communications  
b) video transmission in all TV systems to conserve bandwidth  
c) long-distance HF radiotelephony  
d) point-to-point radiotelephony where more than one channel is required
- 9) Foster Seelay discriminator uses a \_\_\_\_\_.  
a) single tuned circuit  
b) double tuned circuit with primary and secondary tuned to the same frequency  
c) double tuned circuit with primary and secondary tuned to the different frequency  
d) none of the above
- 10) Pre-emphasis is used to amplify \_\_\_\_\_.  
a) low frequency  
b) high frequency  
c) both (a) and (b) above  
d) none of the above
- 11) The commercial FM radio broadcast band is \_\_\_\_\_.  
a) 535 to 1600 kHz  
b) 20 to 80 kHz  
c) 88 to 108 MHz  
d) 300 to 3000 MHz
- 12) The difference between PM and FM \_\_\_\_\_.  
a) lies in the poorer audio response of phase modulation  
b) is too great to make the two systems compatible  
c) is purely theoretical because practically both are identical  
d) none of these
- 13) The phase shift method for generation of SSB signal is most suitable for \_\_\_\_\_.  
a) data signals  
b) weak modulating signals  
c) larger bandwidth modulating signals  
d) smaller bandwidth modulating signals
- 14) Determine the Bandwidth of a FM wave when the maximum deviation allowed is 75KHz and the modulating signal has a frequency of 20KHz.  
a) 170 KHz  
b) 190 KHz  
c) 100 KHz  
d) 1000 KHz

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 16**

- Explain the significance of different blocks in an electronics communication system.
- List various external noises and give a brief description of each one of them.
- An AM broadcast radio station radiates 10KW of power, if modulation percentage is 60. Calculate how much of this is the carrier power.
- Derive an expression for the AM wave.
- Draw the schematic diagram of VSB modulation and explain.

**Q.3 Answer the following question. (Any Two) 12**

- An AM Signal has a peak unmodulated earner voltage,  $V_c = 100$  V, a load resistance,  $R = 50$  ohm, and a modulation index, Modulation index is 1. Determine the following:
  - The carrier power
  - The lower-sideband and upper-sideband power
  - Total sideband power
  - Total power of the modulated AM Signal
  - Sketch the AM power spectrum
- Derive Friis formula for the noise figure of cascaded stages in terms of available power gain and noise figure of each stage.
- What are the methods of generating SSB? Explain any one in detail.

**Section – II**

**Q.4 Answer the following question. (Any Four) 16**

- Illustrate the concept of PWM.
- State and prove sampling theorem for baseband signal.
- What is pre-emphasis and de-emphasis? Why is it used?
- Define the term with suitable example data : Selectivity , Sensitivity , Fidelity and Image Frequency.
- State advantages and disadvantages of TRF receiver.

**Q.5 Answer the following question. (Any Two) 12**

- With block diagrams, explicate the working of the Armstrong frequency modulator system.
- Illustrate with an example the concept of TDM and FDM.
- Describe with the help of a diagram, the working of a superheterodyne receiver. Explain function and purpose of each block.

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Set **Q**

**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Vestigial sideband (VSB) transmission is exclusively used for \_\_\_\_\_.  
 a) HF mobile communications  
 b) video transmission in all TV systems to conserve bandwidth  
 c) long-distance HF radiotelephony  
 d) point-to-point radiotelephony where more than one channel is required
- 2) Foster Seelay discriminator uses a \_\_\_\_\_.  
 a) single tuned circuit  
 b) double tuned circuit with primary and secondary tuned to the same frequency  
 c) double tuned circuit with primary and secondary tuned to the different frequency  
 d) none of the above
- 3) Pre-emphasis is used to amplify \_\_\_\_\_.  
 a) low frequency  
 b) high frequency  
 c) both (a) and (b) above  
 d) none of the above
- 4) The commercial FM radio broadcast band is \_\_\_\_\_.  
 a) 535 to 1600 kHz  
 b) 20 to 80 kHz  
 c) 88 to 108 MHz  
 d) 300 to 3000 MHz
- 5) The difference between PM and FM \_\_\_\_\_.  
 a) lies in the poorer audio response of phase modulation  
 b) is too great to make the two systems compatible  
 c) is purely theoretical because practically both are identical  
 d) none of these
- 6) The phase shift method for generation of SSB signal is most suitable for \_\_\_\_\_.  
 a) data signals  
 b) weak modulating signals  
 c) larger bandwidth modulating signals  
 d) smaller bandwidth modulating signals

- 7) Determine the Bandwidth of a FM wave when the maximum deviation allowed is 75KHz and the modulating signal has a frequency of 20KHz.
- a) 170 KHz
  - b) 190 KHz
  - c) 100 KHz
  - d) 1000 KHz
- 8) Noise is added to a signal in a communication system \_\_\_\_\_.  
a) At the receiving end  
b) At transmitting antenna  
c) In the channel  
d) During regeneration of the information
- 9) Noise power at the resistor is affected by the value of the resistor as \_\_\_\_\_.  
a) Directly proportional to the value of the resistor  
b) Inversely proportional to the value of the resistor  
c) Unaffected by the value of the resistor  
d) Becomes half as the resistance value is doubled
- 10) Low frequency noise is \_\_\_\_\_.  
a) Transit time noise- b) Flicker noise
- c) Shot noise
- d) None of the above

11) Thermal noise is also known as \_\_\_\_\_.  
a) Johnson noise- b) Partition noise
- c) Flicker noise
- d) Solar noise

12) Modulation is the process of \_\_\_\_\_.  
a) generating constant-frequency radio waves  
b) combining audio and radio-frequency waves at the transmitting end of a communication system  
c) reducing distortion in RF amplifiers  
d) improving thermal stability of a transistor

13) As compared to DSB-FC, 100% modulated transmission, power saving in SSB-SC system is \_\_\_\_\_ percent.  
a) 94.4- b) 85
- c) 100
- d) 83.3

14) Pilot-carrier transmission is one in which \_\_\_\_\_.  
a) only one sideband is transmitted  
b) one sidebands and carrier are transmitted  
c) only two sidebands are transmitted  
d) two sidebands as well as a trace of carrier are transmitted

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 16**

- Explain the significance of different blocks in an electronics communication system.
- List various external noises and give a brief description of each one of them.
- An AM broadcast radio station radiates 10KW of power, if modulation percentage is 60. Calculate how much of this is the carrier power.
- Derive an expression for the AM wave.
- Draw the schematic diagram of VSB modulation and explain.

**Q.3 Answer the following question. (Any Two) 12**

- An AM Signal has a peak unmodulated earner voltage,  $V_c = 100$  V, a load resistance,  $R = 50$  ohm, and a modulation index, Modulation index is 1. Determine the following:
  - The carrier power
  - The lower-sideband and upper-sideband power
  - Total sideband power
  - Total power of the modulated AM Signal
  - Sketch the AM power spectrum
- Derive Friis formula for the noise figure of cascaded stages in terms of available power gain and noise figure of each stage.
- What are the methods of generating SSB? Explain any one in detail.

**Section – II**

**Q.4 Answer the following question. (Any Four) 16**

- Illustrate the concept of PWM.
- State and prove sampling theorem for baseband signal.
- What is pre-emphasis and de-emphasis? Why is it used?
- Define the term with suitable example data : Selectivity , Sensitivity , Fidelity and Image Frequency.
- State advantages and disadvantages of TRF receiver.

**Q.5 Answer the following question. (Any Two) 12**

- With block diagrams, explicate the working of the Armstrong frequency modulator system.
- Illustrate with an example the concept of TDM and FDM.
- Describe with the help of a diagram, the working of a superheterodyne receiver. Explain function and purpose of each block.

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Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks: 14

## 14

- Page 7 of 12



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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 16**

- Explain the significance of different blocks in an electronics communication system.
- List various external noises and give a brief description of each one of them.
- An AM broadcast radio station radiates 10KW of power, if modulation percentage is 60. Calculate how much of this is the carrier power.
- Derive an expression for the AM wave.
- Draw the schematic diagram of VSB modulation and explain.

**Q.3 Answer the following question. (Any Two) 12**

- An AM Signal has a peak unmodulated earner voltage,  $V_c = 100$  V, a load resistance,  $R = 50$  ohm, and a modulation index, Modulation index is 1. Determine the following:
  - The carrier power
  - The lower-sideband and upper-sideband power
  - Total sideband power
  - Total power of the modulated AM Signal
  - Sketch the AM power spectrum
- Derive Friis formula for the noise figure of cascaded stages in terms of available power gain and noise figure of each stage.
- What are the methods of generating SSB? Explain any one in detail.

**Section – II**

**Q.4 Answer the following question. (Any Four) 16**

- Illustrate the concept of PWM.
- State and prove sampling theorem for baseband signal.
- What is pre-emphasis and de-emphasis? Why is it used?
- Define the term with suitable example data : Selectivity , Sensitivity , Fidelity and Image Frequency.
- State advantages and disadvantages of TRF receiver.

**Q.5 Answer the following question. (Any Two) 12**

- With block diagrams, explicate the working of the Armstrong frequency modulator system.
- Illustrate with an example the concept of TDM and FDM.
- Describe with the help of a diagram, the working of a superheterodyne receiver. Explain function and purpose of each block.



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Set **S**

**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) As compared to DSB-FC, 100% modulated transmission, power saving in SSB-SC system is \_\_\_\_\_ percent.
 

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| a) 94.4 | b) 85   |
| c) 100  | d) 83.3 |
- 2) Pilot-carrier transmission is one in which \_\_\_\_\_.
  - a) only one sideband is transmitted
  - b) one sideband and carrier are transmitted
  - c) only two sidebands are transmitted
  - d) two sidebands as well as a trace of carrier are transmitted
- 3) Vestigial sideband (VSB) transmission is exclusively used for \_\_\_\_\_.
  - a) HF mobile communications
  - b) video transmission in all TV systems to conserve bandwidth
  - c) long-distance HF radiotelephony
  - d) point-to-point radiotelephony where more than one channel is required
- 4) Foster Seely discriminator uses a \_\_\_\_\_.
  - a) single tuned circuit
  - b) double tuned circuit with primary and secondary tuned to the same frequency
  - c) double tuned circuit with primary and secondary tuned to the different frequency
  - d) none of the above
- 5) Pre-emphasis is used to amplify \_\_\_\_\_.
 

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| a) low frequency          | b) high frequency    |
| c) both (a) and (b) above | d) none of the above |
- 6) The commercial FM radio broadcast band is \_\_\_\_\_.
 

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| a) 535 to 1600 kHz | b) 20 to 80 kHz    |
| c) 88 to 108 MHz   | d) 300 to 3000 MHz |

- 7) The difference between PM and FM \_\_\_\_\_.
  - a) lies in the poorer audio response of phase modulation
  - b) is too great to make the two systems compatible
  - c) is purely theoretical because practically both are identical
  - d) none of these
- 8) The phase shift method for generation of SSB signal is most suitable for \_\_\_\_\_.
  - a) data signals
  - b) weak modulating signals
  - c) larger bandwidth modulating signals
  - d) smaller bandwidth modulating signals
- 9) Determine the Bandwidth of a FM wave when the maximum deviation allowed is 75KHz and the modulating signal has a frequency of 20KHz.
  - a) 170 KHz
  - b) 190 KHz
  - c) 100 KHz
  - d) 1000 KHz
- 10) Noise is added to a signal in a communication system \_\_\_\_\_.
  - a) At the receiving end
  - b) At transmitting antenna
  - c) In the channel
  - d) During regeneration of the information
- 11) Noise power at the resistor is affected by the value of the resistor as \_\_\_\_\_.
  - a) Directly proportional to the value of the resistor
  - b) Inversely proportional to the value of the resistor
  - c) Unaffected by the value of the resistor
  - d) Becomes half as the resistance value is doubled
- 12) Low frequency noise is \_\_\_\_\_.
  - a) Transit time noise
  - b) Flicker noise
  - c) Shot noise
  - d) None of the above
- 13) Thermal noise is also known as \_\_\_\_\_.
  - a) Johnson noise
  - b) Partition noise
  - c) Flicker noise
  - d) Solar noise
- 14) Modulation is the process of \_\_\_\_\_.
  - a) generating constant-frequency radio waves
  - b) combining audio and radio-frequency waves at the transmitting end of a communication system
  - c) reducing distortion in RF amplifiers
  - d) improving thermal stability of a transistor

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**S. Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Communication**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four) 16**

- Explain the significance of different blocks in an electronics communication system.
- List various external noises and give a brief description of each one of them.
- An AM broadcast radio station radiates 10KW of power, if modulation percentage is 60. Calculate how much of this is the carrier power.
- Derive an expression for the AM wave.
- Draw the schematic diagram of VSB modulation and explain.

**Q.3 Answer the following question. (Any Two) 12**

- An AM Signal has a peak unmodulated earner voltage,  $V_c = 100$  V, a load resistance,  $R = 50$  ohm, and a modulation index, Modulation index is 1. Determine the following:
  - The carrier power
  - The lower-sideband and upper-sideband power
  - Total sideband power
  - Total power of the modulated AM Signal
  - Sketch the AM power spectrum
- Derive Friis formula for the noise figure of cascaded stages in terms of available power gain and noise figure of each stage.
- What are the methods of generating SSB? Explain any one in detail.

**Section – II**

**Q.4 Answer the following question. (Any Four) 16**

- Illustrate the concept of PWM.
- State and prove sampling theorem for baseband signal.
- What is pre-emphasis and de-emphasis? Why is it used?
- Define the term with suitable example data : Selectivity , Sensitivity , Fidelity and Image Frequency.
- State advantages and disadvantages of TRF receiver.

**Q.5 Answer the following question. (Any Two) 12**

- With block diagrams, explicate the working of the Armstrong frequency modulator system.
- Illustrate with an example the concept of TDM and FDM.
- Describe with the help of a diagram, the working of a superheterodyne receiver. Explain function and purpose of each block.

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Set **P**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The general solution of  $(D^2 - 4)^2 y = 0$  is \_\_\_\_\_.
  - a)  $y = C_1 e^{2x} + C_2 e^{-2x}$
  - b)  $y = (C_1 + C_2 x) e^{-2x} + (C_3 + C_4 x) e^{2x}$
  - c)  $y = C_1 \cos 2x + C_2 \sin 2x + (C_3 + C_4 x) e^{2x}$
  - d) None of these
- 2) For  $\frac{d^2 y}{dx^2} + 4 \frac{dy}{dx} + 3y = 3e^{2x}$ , the particular integral is \_\_\_\_\_.
  - a)  $\frac{1}{15} e^{2x}$
  - b)  $3e^{2x}$
  - c)  $\frac{1}{5} e^{2x}$
  - d)  $C_1 e^{-x} + C_2 e^{-2x}$
- 3) If the characteristic equation of the diff. equation  $\frac{d^2 y}{dx^2} + 2\alpha \frac{dy}{dx} + y = 0$  has two equal roots then the value of  $\alpha$  are \_\_\_\_\_.
  - a)  $\pm 1$
  - b)  $0, 0$
  - c)  $\pm i$
  - d)  $\pm \frac{1}{2}$
- 4) The conditions for expansion of a function in a Fourier series are known as \_\_\_\_\_.
  - a) Harmonic
  - b) Periodic
  - c) Riemann Conditions
  - d) Dirichlet's conditions
- 5) For the function  $f(x) = \begin{cases} 0, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$  The value of Fourier constant  $a_0$  is \_\_\_\_\_.
  - a)  $\frac{\pi^2}{4}$
  - b)  $\frac{\pi}{4}$
  - c)  $\frac{\pi^2}{2}$
  - d)  $\frac{-\pi}{4}$

- 6) Since  $z\{1\} = \frac{z}{z-1}$ ,  $z\{a^k\}, k \geq 0 =$  \_\_\_\_\_.  
 a)  $\frac{z}{z-a}$  b)  $\frac{z}{a(z-1)}$   
 c)  $\frac{a}{z-a}$  d)  $\frac{z}{az-1}$
- 7) The inverse z-transform of  $\frac{z}{z-3}, |z| > 3$  (with  $k \geq 0$ ) is \_\_\_\_\_.  
 a)  $3^{-k}$  b)  $3^{k+1}$   
 c)  $3^k$  d)  $3^{-k-1}$
- 8)  $L^{-1}\{\phi'(s)\} =$  \_\_\_\_\_.  
 a)  $\frac{-L^{-1}\{\phi(s)\}}{t}$  b)  $-t L^{-1}\{\phi(s)\}$   
 c)  $-L^{-1}\{\phi(s)\}$  d)  $-s L^{-1}\{\phi(s)\}$
- 9) If  $L\{f(t)\} = \frac{a}{s^2+a^2}$  then  $L\left\{\int_0^t f(t)dt\right\} =$  \_\_\_\_\_.  
 a)  $\frac{1}{s(s^2+a^2)}$  b)  $\frac{a}{s(s^2+a^2)}$   
 c)  $\frac{as}{s^2+a^2}$  d)  $\frac{as^2}{s^2+a^2}$
- 10) This method is called as method of chord \_\_\_\_\_.  
 a) Newton Raphson b) False Position  
 c) Bisection d) Both a and b
- 11) The first real positive root of  $x^3 = 6x - 4$  by Newton Raphson method near  $x_0 = 1$  is \_\_\_\_\_.  
 a) 0.6667 b) 0.6  
 c) 0.4 d) 0.3
- 12) The Two regression equations of the variables are  $x = 19.13 - 0.87y$ ,  $y = 11.64 - 0.5x$ . The means of  $x$  and  $y$  are \_\_\_\_\_.  
 a) 16, 2.93 b) 2.93, 16  
 c) 3.67, 15.93 d) 15.93, 3.67
- 13) If a Poisson distribution is such that  $p(x=2) = p(x=3)$  then  $m =$  \_\_\_\_\_.  
 a) 3 b)  $\frac{1}{3}$   
 c) 2 d) 4
- 14) In solving simultaneous linear equations  $AX = B$ , in which method as soon as getting the value of one unknown is immediately used to compute next unknown?  
 a) Jacobi b) Gauss Seidal  
 c) Euler's d) Gauss Elimination

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**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three**

**09**

- Solve:  $(D^2 + 4D + 5)y = -2 \cos hx + 2^x$
- Solve:  $(D^3 + D^2 + D + 1)y = \sin 2x$
- Find the Fourier series of  $f(x) = \begin{cases} \pi x, & 0 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$
- Find the half-range cosine series for  $f(x) = e^{-x}$  in  $(0, \pi)$
- Find the inverse z-transform of  $F(z) = \frac{1}{(z-2)(z-3)}$ , if  $|z| < 2$

**Q.3 Attempt any three**

**09**

- Solve:  $(D^2 + D)y = x^2 + 2x + 4$
- Solve:  $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$
- Find the Fourier series of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$ , in  $(-\pi, \pi)$
- Find  $Z\{a^{|k|}\}$  for all  $k$
- Find  $Z^{-1}\left\{\frac{1}{(z-5)^2}\right\}$ ,  $|z| < 5$

**Q.4 Attempt any two**

**10**

- A condenser of capacity  $C$  is discharged through an inductance  $L$  and resistance  $R$  in series and the charge  $q$  at a time satisfies the equation.

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{C} = 0$$

Given that  $L = 0.25$  Henries,  $R = 250$  ohms,  $C = 2 \times 10^{-6}$  farads and that at  $t = 0$ ,  $q = 0.002$  coulombs and the current  $\frac{dq}{dt} = 0$ , obtain  $q$  in terms of  $t$ .

- Find the Fourier series of  $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$
- Find Z-transform of  $f(k) = \cos \alpha k$ ,  $k \geq 0$

**Section – II**

**Q.5 Attempt any three**

**09**

- If the mean of the binomial distribution is 2 and variance is  $\frac{4}{3}$  find the probability of
  - Two successes
  - Less than to successes

- b) Evaluate  $\int_0^{\infty} \frac{\cos 4t - \cos 3t}{t} dt$  by Laplace transform
- c) Find  $L^{-1}[\tan^{-1}(s + 1)]$
- d) Find the coefficient of correlation between  $x$  and  $y$  from the following data:  
 $n = 25$ ,  $\Sigma x = 120$ ,  $\Sigma x^2 = 650$ ,  $\Sigma y = 100$ ,  $\Sigma y^2 = 450$ ,  $\Sigma xy = 500$
- e) Find an approximate root of  $x \log_{10} x - 1.2 = 0$  by False Position method (Perform 2 iterations)

**Q.6 Attempt any three****09**

- a) Fit a Poisson distribution

|      |     |    |    |   |   |
|------|-----|----|----|---|---|
| $x:$ | 0   | 1  | 2  | 3 | 4 |
| $y:$ | 109 | 65 | 22 | 3 | 1 |

- b) Find Laplace transform of  $f(t) = \frac{2t}{3}$   $0 < t < 3$  and  $f(t)f(t + 3)$
- c) Solve by Gauss Elimination method, the following system of linear simultaneous equations  
 $x + y + 2z = 4$ ,  $3x + y - 3z = -4$ ,  $2x - 3y - 5z = -5$
- d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5 kgs. Find the number of students with weights between 45 and 60 kgs.  
 (For SNV  $z$  area under the Curve between  $z = 0$  and  $z = 1$  is 0.3413 and between  $z = 0$  and  $z = 2$  is 0.4772)
- e) Find the value of  $\sqrt{35}$  by Newton Raphson method, taking  $x_0 = 6$  as initial approximation, correct to 4 decimal places.

**Q.7 Attempt any two****10**

- a) Find  $L^{-1} \left[ \frac{s+29}{(s+4)(s^2+9)} \right]$
- b) Calculate Karl Pearson's coefficient of correlation and the equations of the lines of regression from the following data.
- |      |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|
| $x:$ | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| $y:$ | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 20 | 21 | 22 |
- c) Solve the following system by Jacobi's method (Perform 4 iterations)
- $$10x - 5y - 2z = 3$$
- $$4x - 10y + 3z = -3$$
- $$x + 6y + 10z = -3$$

|          |  |
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Set **Q**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1)  $L^{-1}\{\phi'(s)\} = \underline{\hspace{2cm}}$ 
  - a)  $\frac{-L^{-1}\{\phi(s)\}}{t}$
  - b)  $-t L^{-1}\{\phi(s)\}$
  - c)  $-L^{-1}\{\phi(s)\}$
  - d)  $-s L^{-1}\{\phi(s)\}$
- 2) If  $L\{f(t)\} = \frac{a}{s^2+a^2}$  then  $L\left\{\int_0^t f(t)dt\right\} = \underline{\hspace{2cm}}$ 
  - a)  $\frac{1}{s(s^2+a^2)}$
  - b)  $\frac{a}{s(s^2+a^2)}$
  - c)  $\frac{as}{s^2+a^2}$
  - d)  $\frac{as^2}{s^2+a^2}$
- 3) This method is called as method of chord  $\underline{\hspace{2cm}}$ 
  - a) Newton Raphson
  - b) False Position
  - c) Bisection
  - d) Both a and b
- 4) The first real positive root of  $x^3 = 6x - 4$  by Newton Raphson method near  $x_0 = 1$  is  $\underline{\hspace{2cm}}$ .
  - a) 0.6667
  - b) 0.6
  - c) 0.4
  - d) 0.3
- 5) The Two regression equations of the variables are  $x = 19.13 - 0.87y$ ,  $y = 11.64 - 0.5x$ . The means of  $x$  and  $y$  are  $\underline{\hspace{2cm}}$ .
  - a) 16, 2.93
  - b) 2.93, 16
  - c) 3.67, 15.93
  - d) 15.93, 3.67
- 6) If a Poisson distribution is such that  $p(x = 2) = p(x = 3)$  then  $m = \underline{\hspace{2cm}}$ 
  - a) 3
  - b)  $\frac{1}{3}$
  - c) 2
  - d) 4



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Set **Q**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I****Q.2 Attempt any three****09**

- a) Solve:  $(D^2 + 4D + 5)y = -2 \cos hx + 2^x$   
 b) Solve:  $(D^3 + D^2 + D + 1)y = \sin 2x$   
 c) Find the Fourier series of  $f(x) = \begin{cases} \pi x, & 0 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$   
 d) Find the half-range cosine series for  $f(x) = e^{-x}$  in  $(0, \pi)$   
 e) Find the inverse z-transform of  $F(z) = \frac{1}{(z-2)(z-3)}$ , if  $|z| < 2$

**Q.3 Attempt any three****09**

- a) Solve:  $(D^2 + D)y = x^2 + 2x + 4$   
 b) Solve:  $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$   
 c) Find the Fourier series of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$ , in  $(-\pi, \pi)$   
 d) Find  $Z\{a^{|k|}\}$  for all  $k$   
 e) Find  $Z^{-1}\left\{\frac{1}{(z-5)^2}\right\}$ ,  $|z| < 5$

**Q.4 Attempt any two****10**

- a) A condenser of capacity  $C$  is discharged through an inductance  $L$  and resistance  $R$  in series and the charge  $q$  at a time satisfies the equation.

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{C} = 0$$

Given that  $L = 0.25$  Henries,  $R = 250$  ohms,  $C = 2 \times 10^{-6}$  farads and that at  $t = 0$ ,  $q = 0.002$  coulombs and the current  $\frac{dq}{dt} = 0$ , obtain  $q$  in terms of  $t$ .

- b) Find the Fourier series of  $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$   
 c) Find Z-transform of  $f(k) = \cos \alpha k$ ,  $k \geq 0$

**Section – II****Q.5 Attempt any three****09**

- a) If the mean of the binomial distribution is 2 and variance is  $\frac{4}{3}$  find the probability of  
 i) Two successes  
 ii) Less than to successes

- b) Evaluate  $\int_0^{\infty} \frac{\cos 4t - \cos 3t}{t} dt$  by Laplace transform
- c) Find  $L^{-1}[\tan^{-1}(s + 1)]$
- d) Find the coefficient of correlation between  $x$  and  $y$  from the following data:  
 $n = 25$ ,  $\Sigma x = 120$ ,  $\Sigma x^2 = 650$ ,  $\Sigma y = 100$ ,  $\Sigma y^2 = 450$ ,  $\Sigma xy = 500$
- e) Find an approximate root of  $x \log_{10} x - 1.2 = 0$  by False Position method  
 (Perform 2 iterations)

**Q.6 Attempt any three****09**

- a) Fit a Poisson distribution

|      |     |    |    |   |   |
|------|-----|----|----|---|---|
| $x:$ | 0   | 1  | 2  | 3 | 4 |
| $y:$ | 109 | 65 | 22 | 3 | 1 |

- b) Find Laplace transform of  $f(t) = \frac{2t}{3}$   $0 < t < 3$  and  $f(t)f(t + 3)$
- c) Solve by Gauss Elimination method, the following system of linear simultaneous equations  
 $x + y + 2z = 4$ ,  $3x + y - 3z = -4$ ,  $2x - 3y - 5z = -5$
- d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5 kgs. Find the number of students with weights between 45 and 60 kgs.  
 (For SNV  $z$  area under the Curve between  $z = 0$  and  $z = 1$  is 0.3413 and between  $z = 0$  and  $z = 2$  is 0.4772)
- e) Find the value of  $\sqrt{35}$  by Newton Raphson method, taking  $x_0 = 6$  as initial approximation, correct to 4 decimal places.

**Q.7 Attempt any two****10**

- a) Find  $L^{-1}\left[\frac{s+29}{(s+4)(s^2+9)}\right]$
- b) Calculate Karl Pearson's coefficient of correlation and the equations of the lines of regression from the following data.
- |      |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|
| $x:$ | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| $y:$ | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 20 | 21 | 22 |
- c) Solve the following system by Jacobi's method (Perform 4 iterations)
- $$10x - 5y - 2z = 3$$
- $$4x - 10y + 3z = -3$$
- $$x + 6y + 10z = -3$$

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- 7) If the characteristic equation of the diff. equation  $\frac{d^2y}{dx^2} + 2\alpha \frac{dy}{dx} + y = 0$  has two equal roots then the value of  $\alpha$  are \_\_\_\_\_.  
 a)  $\pm 1$  b)  $0, 0$   
 c)  $\pm i$  d)  $\pm \frac{1}{2}$
- 8) The conditions for expansion of a function in a Fourier series are known as \_\_\_\_\_.  
 a) Harmonic b) Periodic  
 c) Riemann Conditions d) Dirichlet's conditions
- 9) For the function  $f(x) = \begin{cases} 0, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$  The value of Fourier constant  $a_0$  is \_\_\_\_\_.  
 a)  $\frac{\pi^2}{4}$  b)  $\frac{\pi}{4}$   
 c)  $\frac{\pi^2}{2}$  d)  $\frac{-\pi}{4}$
- 10) Since  $z\{1\} = \frac{z}{z-1}$ ,  $z\{a^k\}, k \geq 0 =$  \_\_\_\_\_.  
 a)  $\frac{z}{z-a}$  b)  $\frac{z}{a(z-1)}$   
 c)  $\frac{a}{z-a}$  d)  $\frac{z}{az-1}$
- 11) The inverse z-transform of  $\frac{z}{z-3}, |z| > 3$  (with  $k \geq 0$ ) is \_\_\_\_\_.  
 a)  $3^{-K}$  b)  $3^{k+1}$   
 c)  $3^k$  d)  $3^{-k-1}$
- 12)  $L^{-1}\{\phi'(s)\} =$  \_\_\_\_\_.  
 a)  $\frac{-L^{-1}\{\phi(s)\}}{t}$  b)  $-t L^{-1}\{\phi(s)\}$   
 c)  $-L^{-1}\{\phi(s)\}$  d)  $-s L^{-1}\{\phi(s)\}$
- 13) If  $L\{f(t)\} = \frac{a}{s^2+a^2}$  then  $L\left\{\int_0^t f(t)dt\right\} =$  \_\_\_\_\_.  
 a)  $\frac{1}{s(s^2+a^2)}$  b)  $\frac{a}{s(s^2+a^2)}$   
 c)  $\frac{as}{s^2+a^2}$  d)  $\frac{as^2}{s^2+a^2}$
- 14) This method is called as method of chord \_\_\_\_\_.  
 a) Newton Raphson b) False Position  
 c) Bisection d) Both a and b

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**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three** **09**

- Solve:  $(D^2 + 4D + 5)y = -2 \cos hx + 2^x$
- Solve:  $(D^3 + D^2 + D + 1)y = \sin 2x$
- Find the Fourier series of  $f(x) = \begin{cases} \pi x, & 0 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$
- Find the half-range cosine series for  $f(x) = e^{-x}$  in  $(0, \pi)$
- Find the inverse z-transform of  $F(z) = \frac{1}{(z-2)(z-3)}$ , if  $|z| < 2$

**Q.3 Attempt any three** **09**

- Solve:  $(D^2 + D)y = x^2 + 2x + 4$
- Solve:  $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$
- Find the Fourier series of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$ , in  $(-\pi, \pi)$
- Find  $Z\{a^{|k|}\}$  for all  $k$
- Find  $Z^{-1}\left\{\frac{1}{(z-5)^2}\right\}$ ,  $|z| < 5$

**Q.4 Attempt any two** **10**

- A condenser of capacity  $C$  is discharged through an inductance  $L$  and resistance  $R$  in series and the charge  $q$  at a time satisfies the equation.

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{C} = 0$$

Given that  $L = 0.25$  Henries,  $R = 250$  ohms,  $C = 2 \times 10^{-6}$  farads and that at  $t = 0$ ,  $q = 0.002$  coulombs and the current  $\frac{dq}{dt} = 0$ , obtain  $q$  in terms of  $t$ .

- Find the Fourier series of  $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$
- Find Z-transform of  $f(k) = \cos \alpha k$ ,  $k \geq 0$

**Section – II**

**Q.5 Attempt any three** **09**

- If the mean of the binomial distribution is 2 and variance is  $\frac{4}{3}$  find the probability of
  - Two successes
  - Less than two successes

- b) Evaluate  $\int_0^{\infty} \frac{\cos 4t - \cos 3t}{t} dt$  by Laplace transform
- c) Find  $L^{-1}[\tan^{-1}(s + 1)]$
- d) Find the coefficient of correlation between  $x$  and  $y$  from the following data:  
 $n = 25, \Sigma x = 120, \Sigma x^2 = 650, \Sigma y = 100, \Sigma y^2 = 450, \Sigma xy = 500$
- e) Find an approximate root of  $x \log_{10} x - 1.2 = 0$  by False Position method (Perform 2 iterations)

**Q.6 Attempt any three****09**

- a) Fit a Poisson distribution

|      |     |    |    |   |   |
|------|-----|----|----|---|---|
| $x:$ | 0   | 1  | 2  | 3 | 4 |
| $y:$ | 109 | 65 | 22 | 3 | 1 |

- b) Find Laplace transform of  $f(t) = \frac{2t}{3}, 0 < t < 3$  and  $f(t)f(t + 3)$
- c) Solve by Gauss Elimination method, the following system of linear simultaneous equations  
 $x + y + 2z = 4, \quad 3x + y - 3z = -4, \quad 2x - 3y - 5z = -5$
- d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5 kgs. Find the number of students with weights between 45 and 60 kgs.  
 (For SNV  $z$  area under the Curve between  $z = 0$  and  $z = 1$  is 0.3413 and between  $z = 0$  and  $z = 2$  is 0.4772)
- e) Find the value of  $\sqrt{35}$  by Newton Raphson method, taking  $x_0 = 6$  as initial approximation, correct to 4 decimal places.

**Q.7 Attempt any two****10**

- a) Find  $L^{-1}\left[\frac{s+29}{(s+4)(s^2+9)}\right]$
- b) Calculate Karl Pearson's coefficient of correlation and the equations of the lines of regression from the following data.
- |      |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|
| $x:$ | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| $y:$ | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 20 | 21 | 22 |
- c) Solve the following system by Jacobi's method (Perform 4 iterations)
- $$10x - 5y - 2z = 3$$
- $$4x - 10y + 3z = -3$$
- $$x + 6y + 10z = -3$$

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Set **S**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.  
 4) Use of non-programable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) Since  $z\{1\} = \frac{z}{z-1}$ ,  $z\{a^k\}$ ,  $k \geq 0 =$  \_\_\_\_\_.
  - a)  $\frac{z}{z-a}$
  - b)  $\frac{z}{a(z-1)}$
  - c)  $\frac{a}{z-a}$
  - d)  $\frac{z}{az-1}$
- 2) The inverse z-transform of  $\frac{z}{z-3}$ ,  $|z| > 3$  (with  $k \geq 0$ ) is \_\_\_\_\_.
  - a)  $3^{-k}$
  - b)  $3^{k+1}$
  - c)  $3^k$
  - d)  $3^{-k-1}$
- 3)  $L^{-1}\{\phi'(s)\} =$  \_\_\_\_\_.
  - a)  $\frac{-L^{-1}\{\phi(s)\}}{t}$
  - b)  $-t L^{-1}\{\phi(s)\}$
  - c)  $-L^{-1}\{\phi(s)\}$
  - d)  $-s L^{-1}\{\phi(s)\}$
- 4) If  $L\{f(t)\} = \frac{a}{s^2+a^2}$  then  $L\left\{\int_0^t f(t)dt\right\} =$  \_\_\_\_\_.
  - a)  $\frac{1}{s(s^2+a^2)}$
  - b)  $\frac{a}{s(s^2+a^2)}$
  - c)  $\frac{as}{s^2+a^2}$
  - d)  $\frac{as^2}{s^2+a^2}$
- 5) This method is called as method of chord \_\_\_\_\_.
  - a) Newton Raphson
  - b) False Position
  - c) Bisection
  - d) Both a and b
- 6) The first real positive root of  $x^3 = 6x - 4$  by Newton Raphson method near  $x_0 = 1$  is \_\_\_\_\_.
  - a) 0.6667
  - b) 0.6
  - c) 0.4
  - d) 0.3
- 7) The Two regression equations of the variables are  $x = 19.13 - 0.87y$ ,  $y = 11.64 - 0.5x$ . The means of  $x$  and  $y$  are \_\_\_\_\_.
  - a) 16, 2.93
  - b) 2.93, 16
  - c) 3.67, 15.93
  - d) 15.93, 3.67



- Page 14 of 16

Seat  
No.Set **S**

**S.Y. (B. Tech) (Sem – I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I****Q.2 Attempt any three****09**

- a) Solve:  $(D^2 + 4D + 5)y = -2 \cos hx + 2^x$   
 b) Solve:  $(D^3 + D^2 + D + 1)y = \sin 2x$   
 c) Find the Fourier series of  $f(x) = \begin{cases} \pi x, & 0 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$   
 d) Find the half-range cosine series for  $f(x) = e^{-x}$  in  $(0, \pi)$   
 e) Find the inverse z-transform of  $F(z) = \frac{1}{(z-2)(z-3)}$ , if  $|z| < 2$

**Q.3 Attempt any three****09**

- a) Solve:  $(D^2 + D)y = x^2 + 2x + 4$   
 b) Solve:  $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$   
 c) Find the Fourier series of  $f(x) = \frac{x(\pi^2 - x^2)}{12}$ , in  $(-\pi, \pi)$   
 d) Find  $Z\{a^{|k|}\}$  for all  $k$   
 e) Find  $Z^{-1}\left\{\frac{1}{(z-5)^2}\right\}$ ,  $|z| < 5$

**Q.4 Attempt any two****10**

- a) A condenser of capacity  $C$  is discharged through an inductance  $L$  and resistance  $R$  in series and the charge  $q$  at a time satisfies the equation.

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{C} = 0$$

Given that  $L = 0.25$  Henries,  $R = 250$  ohms,  $C = 2 \times 10^{-6}$  farads and that at  $t = 0$ ,  $q = 0.002$  coulombs and the current  $\frac{dq}{dt} = 0$ , obtain  $q$  in terms of  $t$ .

- b) Find the Fourier series of  $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$   
 c) Find Z-transform of  $f(k) = \cos \alpha k$ ,  $k \geq 0$

**Section – II****Q.5 Attempt any three****09**

- a) If the mean of the binomial distribution is 2 and variance is  $\frac{4}{3}$  find the probability of  
 i) Two successes  
 ii) Less than to successes

- b) Evaluate  $\int_0^{\infty} \frac{\cos 4t - \cos 3t}{t} dt$  by Laplace transform
- c) Find  $L^{-1}[\tan^{-1}(s + 1)]$
- d) Find the coefficient of correlation between  $x$  and  $y$  from the following data:  
 $n = 25$ ,  $\Sigma x = 120$ ,  $\Sigma x^2 = 650$ ,  $\Sigma y = 100$ ,  $\Sigma y^2 = 450$ ,  $\Sigma xy = 500$
- e) Find an approximate root of  $x \log_{10} x - 1.2 = 0$  by False Position method  
 (Perform 2 iterations)

**Q.6 Attempt any three****09**

- a) Fit a Poisson distribution

|      |     |    |    |   |   |
|------|-----|----|----|---|---|
| $x:$ | 0   | 1  | 2  | 3 | 4 |
| $y:$ | 109 | 65 | 22 | 3 | 1 |

- b) Find Laplace transform of  $f(t) = \frac{2t}{3}$   $0 < t < 3$  and  $f(t)f(t + 3)$
- c) Solve by Gauss Elimination method, the following system of linear simultaneous equations  
 $x + y + 2z = 4$ ,  $3x + y - 3z = -4$ ,  $2x - 3y - 5z = -5$
- d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5 kgs. Find the number of students with weights between 45 and 60 kgs.  
 (For SNV  $z$  area under the Curve between  $z = 0$  and  $z = 1$  is 0.3413 and between  $z = 0$  and  $z = 2$  is 0.4772)
- e) Find the value of  $\sqrt{35}$  by Newton Raphson method, taking  $x_0 = 6$  as initial approximation, correct to 4 decimal places.

**Q.7 Attempt any two****10**

- a) Find  $L^{-1} \left[ \frac{s+29}{(s+4)(s^2+9)} \right]$
- b) Calculate Karl Pearson's coefficient of correlation and the equations of the lines of regression from the following data.
- |      |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|
| $x:$ | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| $y:$ | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 20 | 21 | 22 |
- c) Solve the following system by Jacobi's method (Perform 4 iterations)
- $$10x - 5y - 2z = 3$$
- $$4x - 10y + 3z = -3$$
- $$x + 6y + 10z = -3$$

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control System**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Traffic light system is the example of:
  - a) Open-loop system
  - b) Closed-loop system
  - c) Both (a) and (b)
  - d) None of these
- 2) Which type of node comprises incoming as well as outgoing branches?
  - a) Source node
  - b) Sink node
  - c) Chain node
  - d) Main node
- 3) In a signal flow graph method, how is an overall transfer function of a system obtained?
  - a) Poisson's equation
  - b) Block diagram reduction rules
  - c) Mason's equation
  - d) Lagrange's equation
- 4) If finite number of blocks are connected in series or cascade configuration, then how are the blocks combined algebraically?
  - a) By addition
  - b) By multiplication
  - c) By differentiation
  - d) By integration
- 5) Which among the following is represented by a parabolic input signal?
  - a) Position
  - b) Force
  - c) Velocity
  - d) Acceleration
- 6) The position and velocity errors of a type-2 system are :
  - a) Constant, constant
  - b) Constant, infinity
  - c) Zero, constant
  - d) Zero, zero
- 7) On which factor does the steady state error of the system depend?
  - a) Order
  - b) Type
  - c) Size
  - d) Prototype
- 8) For drawing root locus, the angle of asymptote yields the direction along which \_\_\_\_\_ branches approach to infinity.
  - a)  $p + z$
  - b)  $p - z$
  - c)  $p / z$
  - d)  $p \times z$
- 9) What should be the nature of root locus about the real axis?
  - a) Asymmetric
  - b) Symmetric
  - c) Exponential
  - d) Decaying

- 10) In Routh array, if zero is found in the first column, then by which term it needs to be replaced?
- |             |                  |
|-------------|------------------|
| a) $\delta$ | b) $\eta$        |
| c) $\sigma$ | d) $\varepsilon$ |
- 11) Adding of poles in a transfer function causes compensation \_\_\_\_\_
- |               |                  |
|---------------|------------------|
| a) lag        | b) lead          |
| c) lag – lead | d) none of these |
- 12) With the knowledge of state space representation, the transfer function of the system \_\_\_\_\_
- |                             |                                 |
|-----------------------------|---------------------------------|
| a) Can be determined partly | b) Can be determined completely |
| c) Cannot be determined     | d) None of these                |
- 13) How is the sinusoidal transfer function obtained from the system transfer function in frequency domain?
- |                                            |                                           |
|--------------------------------------------|-------------------------------------------|
| a) Replacement of ' $j\omega$ ' by ' $s$ ' | b) Replacement of ' $s$ ' by ' $\omega$ ' |
| c) Replacement of ' $s$ ' by ' $j\omega$ ' | d) Replacement of ' $\omega$ ' by ' $s$ ' |
- 14) According to the property of state transition method,  $e^0$  is equal to \_\_\_\_\_
- |              |              |
|--------------|--------------|
| a) $I$       | b) $A$       |
| c) $e^{-At}$ | d) $-e^{At}$ |

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Set **P**

**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control System**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Answer any Four questions.**

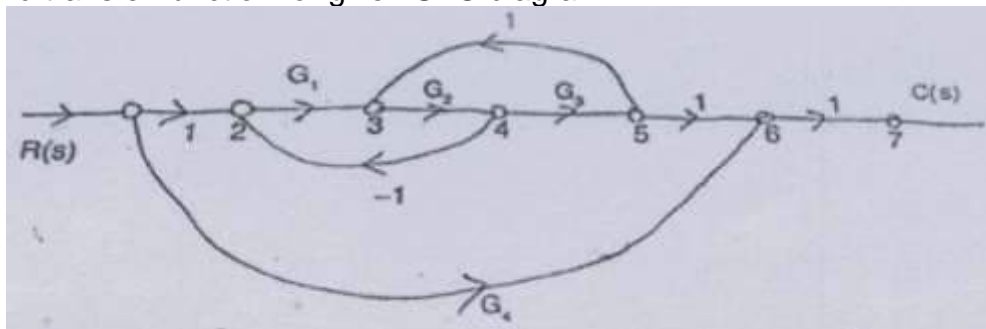
**16**

- Define a transfer function? Derive transfer function for closed loop control system.
- Compare open loop control system with closed loop control.
- Explain Mason's gain formula.
- What is a "TYPES" of system? Explain type 0 and type 1 system.
- Derive the time response of 1st order system to unit step.

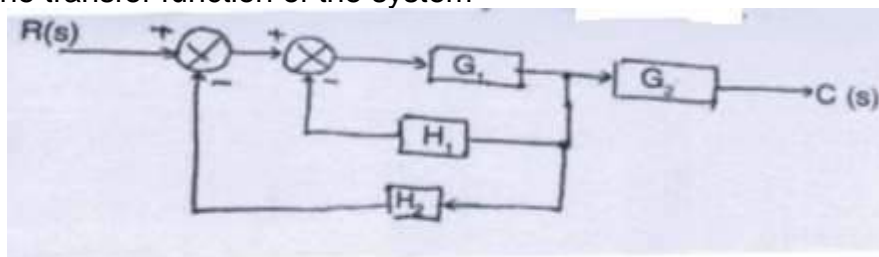
**Q.3 Answer any two questions.**

**12**

- a) Find transfer function for given SFG diagram.



- b) Find the transfer function of the system



- c) Calculate  $K_p$ ,  $K_v$ ,  $K_a$  steady state error with open loop transfer function as:  
 $G(s) \cdot H(s) = 10(S + 2)(S + 3)/S(S + 1)(S + 4)(S + 5)$  and  $r(t) = 3 + t + t^2$

## Section – II

**Q.4 Answer any Four questions.****16**

- a) What is root locus? Explain all the steps which are required to draw root locus?
- b) Investigate the stability of the system with characteristics equation
$$Q(S) = S^4 + 6S^3 + 15S^2 + 5S + 3$$
- c) State the advantages of frequency response method.
- d) How Routh's criteria is used to study the relative stability?
- e) What is state transition matrix? State the properties of state transition matrix.

**Q.5 Answer any two questions.****12**

- a) Explain in a two special cases of Routh Criteria?
- b) Determine damping factor, under damped natural frequency, resonant peak & resonant Frequency for the system with closed loop transfer function

$$G(S) = \frac{36}{S^2 + 6S + 36}$$

- c) Explain in a detail Lead Lag compensator.

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| Set Q |
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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control System**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) For drawing root locus, the angle of asymptote yields the direction along which \_\_\_\_\_ branches approach to infinity.
 

|            |                 |
|------------|-----------------|
| a) $p + z$ | b) $p - z$      |
| c) $p / z$ | d) $p \times z$ |
- 2) What should be the nature of root locus about the real axis?
 

|                |              |
|----------------|--------------|
| a) Asymmetric  | b) Symmetric |
| c) Exponential | d) Decaying  |
- 3) In Routh array, if zero is found in the first column, then by which term it needs to be replaced?
 

|             |                  |
|-------------|------------------|
| a) $\delta$ | b) $\eta$        |
| c) $\sigma$ | d) $\varepsilon$ |
- 4) Adding of poles in a transfer function causes compensation \_\_\_\_\_.
 

|               |                  |
|---------------|------------------|
| a) lag        | b) lead          |
| c) lag – lead | d) none of these |
- 5) With the knowledge of state space representation, the transfer function of the system \_\_\_\_\_.
 

|                             |                                 |
|-----------------------------|---------------------------------|
| a) Can be determined partly | b) Can be determined completely |
| c) Cannot be determined     | d) None of these                |
- 6) How is the sinusoidal transfer function obtained from the system transfer function in frequency domain?
 

|                                            |                                           |
|--------------------------------------------|-------------------------------------------|
| a) Replacement of ' $j\omega$ ' by ' $s$ ' | b) Replacement of ' $s$ ' by ' $\omega$ ' |
| c) Replacement of ' $s$ ' by ' $j\omega$ ' | d) Replacement of ' $\omega$ ' by ' $s$ ' |
- 7) According to the property of state transition method,  $e^{0}$  is equal to \_\_\_\_\_.
 

|              |              |
|--------------|--------------|
| a) I         | b) A         |
| c) $e^{-At}$ | d) $-e^{At}$ |
- 8) Traffic light system is the example of:
 

|                     |                       |
|---------------------|-----------------------|
| a) Open-loop system | b) Closed-loop system |
| c) Both (a) and (b) | d) None of these      |



- 9) Which type of node comprises incoming as well as outgoing branches?
  - a) Source node
  - b) Sink node
  - c) Chain node
  - d) Main node
- 10) In a signal flow graph method, how is an overall transfer function of a system obtained?
  - a) Poisson's equation
  - b) Block diagram reduction rules
  - c) Mason's equation
  - d) Lagrange's equation
- 11) If finite number of blocks are connected in series or cascade configuration, then how are the blocks combined algebraically?
  - a) By addition
  - b) By multiplication
  - c) By differentiation
  - d) By integration
- 12) Which among the following is represented by a parabolic input signal?
  - a) Position
  - b) Force
  - c) Velocity
  - d) Acceleration
- 13) The position and velocity errors of a type-2 system are :
  - a) Constant, constant
  - b) Constant, infinity
  - c) Zero, constant
  - d) Zero, zero
- 14) On which factor does the steady state error of the system depend?
  - a) Order
  - b) Type
  - c) Size
  - d) Prototype

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Set **Q**

**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control System**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Answer any Four questions.**

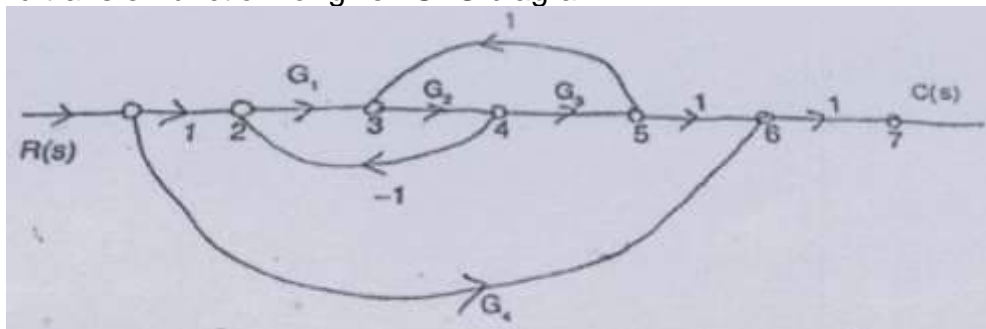
**16**

- Define a transfer function? Derive transfer function for closed loop control system.
- Compare open loop control system with closed loop control.
- Explain Mason's gain formula.
- What is a "TYPES" of system? Explain type 0 and type 1 system.
- Derive the time response of 1st order system to unit step.

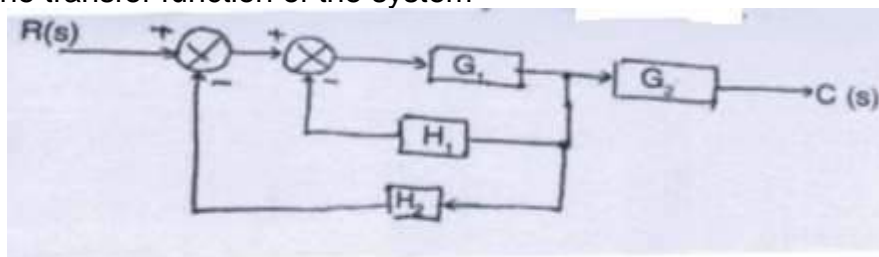
**Q.3 Answer any two questions.**

**12**

- a) Find transfer function for given SFG diagram.



- b) Find the transfer function of the system



- c) Calculate  $K_p$ ,  $K_v$ ,  $K_a$  steady state error with open loop transfer function as:  
 $G(s).H(s) = 10(S + 2)(S + 3)/S(S + 1)(S + 4)(S + 5)$  and  $r(t) = 3 + t + t^2$

## Section – II

**Q.4 Answer any Four questions.****16**

- a) What is root locus? Explain all the steps which are required to draw root locus?
- b) Investigate the stability of the system with characteristics equation
$$Q(S) = S^4 + 6S^3 + 15S^2 + 5S + 3$$
- c) State the advantages of frequency response method.
- d) How Routh's criteria is used to study the relative stability?
- e) What is state transition matrix? State the properties of state transition matrix.

**Q.5 Answer any two questions.****12**

- a) Explain in a two special cases of Routh Criteria?
- b) Determine damping factor, under damped natural frequency, resonant peak & resonant Frequency for the system with closed loop transfer function

$$G(S) = \frac{36}{S^2 + 6S + 36}$$

- c) Explain in a detail Lead Lag compensator.

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Day & Date: Monday, 06-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 9 of 16

- 9) Which among the following is represented by a parabolic input signal?
- |             |                 |
|-------------|-----------------|
| a) Position | b) Force        |
| c) Velocity | d) Acceleration |
- 10) The position and velocity errors of a type-2 system are :
- |                       |                       |
|-----------------------|-----------------------|
| a) Constant, constant | b) Constant, infinity |
| c) Zero, constant     | d) Zero, zero         |
- 11) On which factor does the steady state error of the system depend?
- |          |              |
|----------|--------------|
| a) Order | b) Type      |
| c) Size  | d) Prototype |
- 12) For drawing root locus, the angle of asymptote yields the direction along which \_\_\_\_\_ branches approach to infinity.
- |            |                 |
|------------|-----------------|
| a) $p + z$ | b) $p - z$      |
| c) $p / z$ | d) $p \times z$ |
- 13) What should be the nature of root locus about the real axis?
- |                |              |
|----------------|--------------|
| a) Asymmetric  | b) Symmetric |
| c) Exponential | d) Decaying  |
- 14) In Routh array, if zero is found in the first column, then by which term it needs to be replaced?
- |             |                  |
|-------------|------------------|
| a) $\delta$ | b) $\eta$        |
| c) $\sigma$ | d) $\varepsilon$ |

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control System**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Answer any Four questions.**

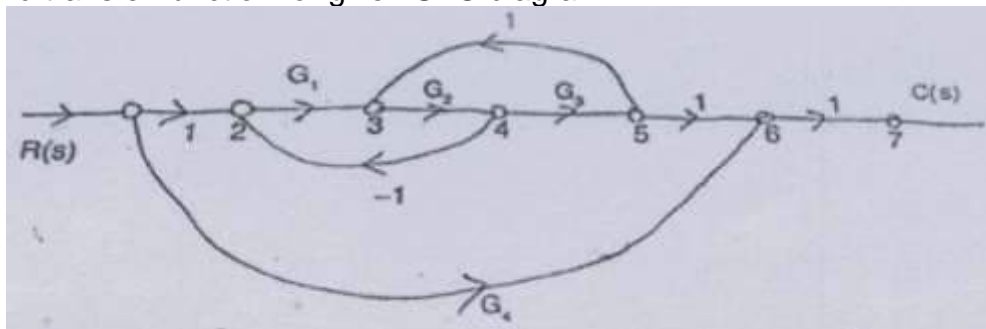
16

- Define a transfer function? Derive transfer function for closed loop control system.
- Compare open loop control system with closed loop control.
- Explain Mason's gain formula.
- What is a "TYPES" of system? Explain type 0 and type 1 system.
- Derive the time response of 1st order system to unit step.

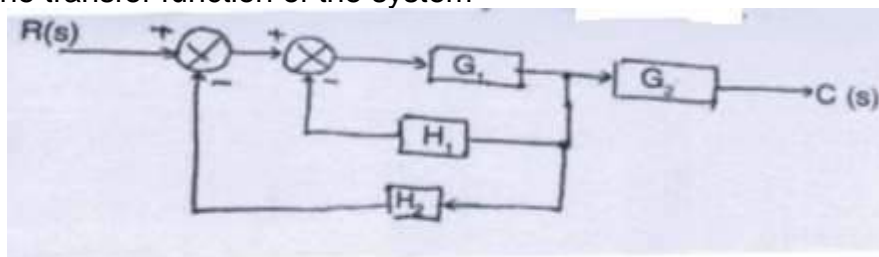
**Q.3 Answer any two questions.**

12

- a) Find transfer function for given SFG diagram.



- b) Find the transfer function of the system



- c) Calculate  $K_p$ ,  $K_v$ ,  $K_a$  steady state error with open loop transfer function as:  
 $G(s) \cdot H(s) = 10(S + 2)(S + 3)/S(S + 1)(S + 4)(S + 5)$  and  $r(t) = 3 + t + t^2$

## Section – II

**Q.4 Answer any Four questions.****16**

- a) What is root locus? Explain all the steps which are required to draw root locus?
- b) Investigate the stability of the system with characteristics equation
$$Q(S) = S^4 + 6S^3 + 15S^2 + 5S + 3$$
- c) State the advantages of frequency response method.
- d) How Routh's criteria is used to study the relative stability?
- e) What is state transition matrix? State the properties of state transition matrix.

**Q.5 Answer any two questions.****12**

- a) Explain in a two special cases of Routh Criteria?
- b) Determine damping factor, under damped natural frequency, resonant peak & resonant Frequency for the system with closed loop transfer function

$$G(S) = \frac{36}{S^2 + 6S + 36}$$

- c) Explain in a detail Lead Lag compensator.

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control System**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The position and velocity errors of a type-2 system are :  
 a) Constant, constant                      b) Constant, infinity  
 c) Zero, constant                              d) Zero, zero
- 2) On which factor does the steady state error of the system depend?  
 a) Order                                              b) Type  
 c) Size                                                d) Prototype
- 3) For drawing root locus, the angle of asymptote yields the direction along which \_\_\_\_\_ branches approach to infinity.  
 a)  $p + z$                                               b)  $p - z$   
 c)  $p / z$                                                 d)  $p \times z$
- 4) What should be the nature of root locus about the real axis?  
 a) Asymmetric                                      b) Symmetric  
 c) Exponential                                      d) Decaying
- 5) In Routh array, if zero is found in the first column, then by which term it needs to be replaced?  
 a)  $\delta$                                                       b)  $\eta$   
 c)  $\sigma$                                                       d)  $\varepsilon$
- 6) Adding of poles in a transfer function causes compensation \_\_\_\_\_.  
 a) lag                                                      b) lead  
 c) lag – lead                                              d) none of these
- 7) With the knowledge of state space representation, the transfer function of the system \_\_\_\_\_.  
 a) Can be determined partly                      b) Can be determined completely  
 c) Cannot be determined                              d) None of these
- 8) How is the sinusoidal transfer function obtained from the system transfer function in frequency domain?  
 a) Replacement of ' $j\omega$ ' by ' $s$ '                      b) Replacement of ' $s$ ' by ' $\omega$ '  
 c) Replacement of ' $s$ ' by ' $j\omega$ '                      d) Replacement of ' $\omega$ ' by ' $s$ '



- 9) According to the property of state transition method,  $e_0$  is equal to \_\_\_\_
  - a)  $I$
  - b)  $A$
  - c)  $e^{-At}$
  - d)  $-e^{At}$
- 10) Traffic light system is the example of:
  - a) Open-loop system
  - b) Closed-loop system
  - c) Both (a) and (b)
  - d) None of these
- 11) Which type of node comprises incoming as well as outgoing branches?
  - a) Source node
  - b) Sink node
  - c) Chain node
  - d) Main node
- 12) In a signal flow graph method, how is an overall transfer function of a system obtained?
  - a) Poisson's equation
  - b) Block diagram reduction rules
  - c) Mason's equation
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- 13) If finite number of blocks are connected in series or cascade configuration, then how are the blocks combined algebraically?
  - a) By addition
  - b) By multiplication
  - c) By differentiation
  - d) By integration
- 14) Which among the following is represented by a parabolic input signal?
  - a) Position
  - b) Force
  - c) Velocity
  - d) Acceleration

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Set **S**

**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control System**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Answer any Four questions.**

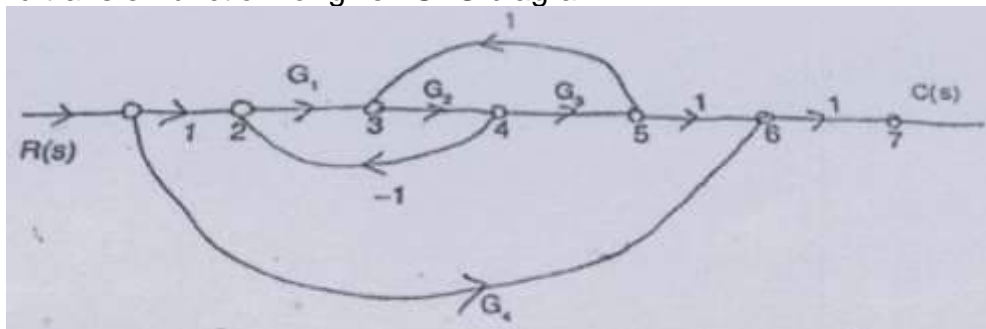
16

- Define a transfer function? Derive transfer function for closed loop control system.
- Compare open loop control system with closed loop control.
- Explain Mason's gain formula.
- What is a "TYPES" of system? Explain type 0 and type 1 system.
- Derive the time response of 1st order system to unit step.

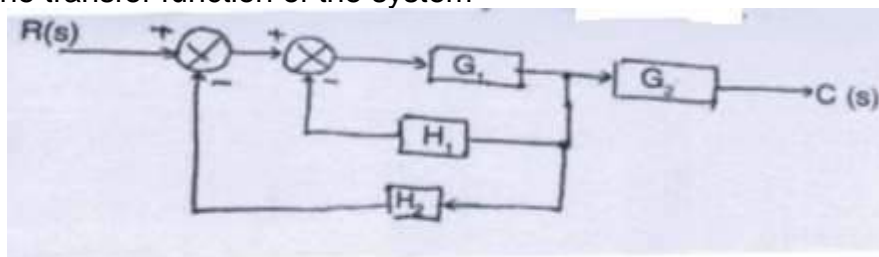
**Q.3 Answer any two questions.**

12

- a) Find transfer function for given SFG diagram.



- b) Find the transfer function of the system



- c) Calculate  $K_p$ ,  $K_v$ ,  $K_a$  steady state error with open loop transfer function as:  
 $G(s) \cdot H(s) = 10(S + 2)(S + 3)/S(S + 1)(S + 4)(S + 5)$  and  $r(t) = 3 + t + t^2$

## Section – II

**Q.4 Answer any Four questions.****16**

- a) What is root locus? Explain all the steps which are required to draw root locus?
- b) Investigate the stability of the system with characteristics equation
$$Q(S) = S^4 + 6S^3 + 15S^2 + 5S + 3$$
- c) State the advantages of frequency response method.
- d) How Routh's criteria is used to study the relative stability?
- e) What is state transition matrix? State the properties of state transition matrix.

**Q.5 Answer any two questions.****12**

- a) Explain in a two special cases of Routh Criteria?
- b) Determine damping factor, under damped natural frequency, resonant peak & resonant Frequency for the system with closed loop transfer function

$$G(S) = \frac{36}{S^2 + 6S + 36}$$

- c) Explain in a detail Lead Lag compensator.

**Seat  
No.**

Max. Marks: 70

Marks: 14

Page 1 of 16



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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any four.** **16**

- Derive equations for  $I_{CQ}$  &  $V_{CEQ}$  of Dual input balanced output differential amplifier using transistors.
- Derive equation for ideal voltage gain of Inverting amplifier using virtual ground concept.
- Define any four electrical parameters of IC 741 with practical & ideal values.
- Explain basic integrator with i/p & o/p waveforms.
- For Inverting amplifier with feedback using IC 741,  $R_1 = 470 \Omega$  &  $R_F = 4.7 K \Omega$ . Calculate the values for  $A_F$ ,  $R_{iF}$ ,  $R_{oF}$  &  $f_F$ .  
 (For IC 741 Assume  $A = 200000$ ,  $R_i = 2M \Omega$ ,  $R_o = 75 \Omega$  &  $f_o = 5 Hz$ )

**Q.3 Attempt any two.** **12**

- Derive expressions for gain  $A_d$  for DIBO differential amplifier using AC equivalent circuit.
- Explain instrumentation amplifier with transducer bridge & derive expression of output voltage.
- Draw high frequency equivalent circuit of op-amp & obtain expression for  $A_{OL(f)}$  open loop gain as function of frequency.

**Section II**

**Q.4 Answer any four questions.** **16**

- Explain with neat diagram operation of window detector using op-amp.
- Draw & Explain op-amp precision full wave rectifier with i/p & o/p waveforms.
- Design RC phase shift oscillator using op-amp 741 for output frequency of 200 Hz.  
 (Assume  $C = 0.1 \mu F$ )
- Explain op-amp square wave generator with circuit diagram & waveforms.
- Explain mono stable multi vibrator using IC 555 with equation for output.

**Q.5 Answer any two questions.**

- a)** Explain op-amp triangular wave generator with circuit diagram & waveforms.
- b)** Design & explain first order low pass filter at cutoff frequency of 1 KHz with a pass band gain of 2.
- c)** Calculate  $V_{ut}$ ,  $V_{lt}$ , hysteresis voltage & draw o/p waveform for op-amp Schmitt trigger circuit With  $V_{in} = 1$  Vp-p sine wave signal,  $\pm V_{cc} = 15$  Volt,  $R_1 = 100 \Omega$ ,  $R_2 = 56 \text{ k}\Omega$  & IC 741.

**Seat  
No.**

Max. Marks: 70

Marks: 14

- 1) For audio frequency oscillator components used are \_\_\_\_\_.  
a) Crystal                                      b) LC  
c) RC                                                d) LRC
- 2) A duty cycle is less than \_\_\_\_\_ in saw tooth wave generator.  
a) 90%                                             b) 66.66%  
c) 50%                                             d) 20%
- 3) The voltage at threshold pin of IC 555 is \_\_\_\_\_.  
a)  $V_{cc}/3$                                           b)  $2 V_{cc}/3$   
c)  $V_{cc}$                                               d) All of these
- 4)  $V_{ref}$  for LM317 is \_\_\_\_\_.  
a) 1.25mV                                         b) 1.25 V  
c) 12.5 V                                            d) None of these
- 5) Butterworth filter is also called as \_\_\_\_\_ filter.  
a) Riple-riple                                    b) Riple-Flat  
c) Flat-ripple                                      d) Flat-Flat
- 6) For second order active filter gain roll off rate in stop band is \_\_\_\_\_.  
a) 40 dB/Decade                                b) 20 dB/decade  
c) 90dB/decade                                 d) 60 dB/decade
- 7) If square wave input is applied to a differentiator, then output will be \_\_\_\_\_.  
a) Inverted square wave                      b) Cosine wave  
c) Sine wave                                        d) Spike wave
- 8) Differential voltage gain of DIBO differential amplifier is \_\_\_\_\_.  
a)  $R_c/2r_e$                                           b)  $2R_c/r_e$   
c)  $R_c/r_e$                                             d)  $2 \beta_{ac} r_e$
- 9) What should be maximum bandwidth for a gain of 10 in case of IC 741?  
a) 1 MHz                                            b) 100 KHz  
c) 10 KHz                                           d) 1 KHz



- 10) The type of feedback used in closed loop inverting amplifier is \_\_\_\_\_.
  - a) Voltage series
  - b) Current series
  - c) Current shunt
  - d) Voltage shunt
- 11)  $\pm V_{sat} / (1+AB)$  is total output offset voltage for \_\_\_\_\_.
  - a) Inverting amplifier
  - b) Non- Inverting amplifier
  - c) Both b & a
  - d) None of these
- 12) I to V converter is special case of \_\_\_\_\_ amplifier.
  - a) Non-inverting
  - b) Inverting
  - c) Differential
  - d) Scaling
- 13) For IC 741 maximum Input bias current at supply voltage  $\pm 15$  volts dc is \_\_\_\_\_.
  - a) 75 nA
  - b) 100 nA
  - c) 750 nA
  - d) 500 nA
- 14) A DC inserter is \_\_\_\_\_.
  - a) Clipper
  - b) Peak detector
  - c) Clamper
  - d) Integrator

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Set **Q**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any four.** **16**

- Derive equations for  $I_{CQ}$  &  $V_{CEQ}$  of Dual input balanced output differential amplifier using transistors.
- Derive equation for ideal voltage gain of Inverting amplifier using virtual ground concept.
- Define any four electrical parameters of IC 741 with practical & ideal values.
- Explain basic integrator with i/p & o/p waveforms.
- For Inverting amplifier with feedback using IC 741,  $R_1 = 470 \Omega$  &  $R_F = 4.7 K \Omega$ . Calculate the values for  $A_F$ ,  $R_{iF}$ ,  $R_{oF}$  &  $f_F$ .  
 (For IC 741 Assume  $A = 200000$ ,  $R_i = 2M \Omega$ ,  $R_o = 75 \Omega$  &  $f_o = 5 Hz$ )

**Q.3 Attempt any two.** **12**

- Derive expressions for gain  $A_d$  for DIBO differential amplifier using AC equivalent circuit.
- Explain instrumentation amplifier with transducer bridge & derive expression of output voltage.
- Draw high frequency equivalent circuit of op-amp & obtain expression for  $A_{OL(f)}$  open loop gain as function of frequency.

**Section II**

**Q.4 Answer any four questions.** **16**

- Explain with neat diagram operation of window detector using op-amp.
- Draw & Explain op-amp precision full wave rectifier with i/p & o/p waveforms.
- Design RC phase shift oscillator using op-amp 741 for output frequency of 200 Hz.  
 (Assume  $C = 0.1 \mu F$ )
- Explain op-amp square wave generator with circuit diagram & waveforms.
- Explain mono stable multi vibrator using IC 555 with equation for output.

**Q.5 Answer any two questions.**

- a)** Explain op-amp triangular wave generator with circuit diagram & waveforms.
- b)** Design & explain first order low pass filter at cutoff frequency of 1 KHz with a pass band gain of 2.
- c)** Calculate  $V_{ut}$ ,  $V_{lt}$ , hysteresis voltage & draw o/p waveform for op-amp Schmitt trigger circuit With  $V_{in} = 1$  Vp-p sine wave signal,  $\pm V_{cc} = 15$  Volt,  $R_1 = 100 \Omega$ ,  $R_2 = 56 \text{ k}\Omega$  & IC 741.

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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

## Marks: 14

- 1) Vref for LM317 is \_\_\_\_\_.  
a) 1.25mV                      b) 1.25 V  
c) 12.5 V                      d) None of these
- 2) Butterworth filter is also called as \_\_\_\_\_ filter.  
a) Riple-ripple                  b) Riple-Flat  
c) Flat-ripple                  d) Flat-Flat
- 3) For second order active filter gain roll off rate in stop band is \_\_\_\_\_.  
a) 40 dB/Decade                  b) 20 dB/decade  
c) 90dB/decade                  d) 60 dB/decade
- 4) If square wave input is applied to a differentiator, then output will be \_\_\_\_\_.  
a) Inverted square wave          b) Cosine wave  
c) Sine wave                      d) Spike wave
- 5) Differential voltage gain of DIBO differential amplifier is \_\_\_\_\_.  
a)  $R_c/2r_e$                       b)  $2R_c/r_e$   
c)  $R_c/r_e$                       d)  $2\beta_{ac} r_e$
- 6) What should be maximum bandwidth for a gain of 10 in case of IC 741?  
a) 1 MHz                          b) 100 KHz  
c) 10 KHz                          d) 1 KHz
- 7) The type of feedback used in closed loop inverting amplifier is \_\_\_\_\_.  
a) Voltage series                  b) Current series  
c) Current shunt                  d) Voltage shunt
- 8)  $\pm V_{sat} / (1+AB)$  is total output offset voltage for \_\_\_\_\_.  
a) Inverting amplifier              b) Non-Inverting amplifier  
c) Both b & a                      d) None of these
- 9) I to V converter is special case of \_\_\_\_\_ amplifier.  
a) Non-inverting                  b) Inverting  
c) Differential                      d) Scaling

- 10) For IC 741 maximum Input bias current at supply voltage  $\pm 15$  volts dc is \_\_\_\_\_.  
a) 75 nA  
b) 100 nA  
c) 750 nA  
d) 500 nA
- 11) A DC inserter is \_\_\_\_\_.  
a) Clipper  
b) Peak detector  
c) Clamper  
d) Integrator
- 12) For audio frequency oscillator components used are \_\_\_\_\_.  
a) Crystal  
b) LC  
c) RC  
d) LRC
- 13) A duty cycle is less than \_\_\_\_\_ in saw tooth wave generator.  
a) 90%  
b) 66.66%  
c) 50%  
d) 20%
- 14) The voltage at threshold pin of IC 555 is \_\_\_\_\_.  
a)  $V_{cc}/3$   
b)  $2 V_{cc}/3$   
c)  $V_{cc}$   
d) All of these

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any four.** **16**

- Derive equations for  $I_{CQ}$  &  $V_{CEQ}$  of Dual input balanced output differential amplifier using transistors.
- Derive equation for ideal voltage gain of Inverting amplifier using virtual ground concept.
- Define any four electrical parameters of IC 741 with practical & ideal values.
- Explain basic integrator with i/p & o/p waveforms.
- For Inverting amplifier with feedback using IC 741,  $R_1 = 470 \Omega$  &  $R_F = 4.7 K \Omega$ . Calculate the values for  $A_F$ ,  $R_{iF}$ ,  $R_{oF}$  &  $f_F$ .  
 (For IC 741 Assume  $A = 200000$ ,  $R_i = 2M \Omega$ ,  $R_o = 75 \Omega$  &  $f_o = 5 Hz$ )

**Q.3 Attempt any two.** **12**

- Derive expressions for gain  $A_d$  for DIBO differential amplifier using AC equivalent circuit.
- Explain instrumentation amplifier with transducer bridge & derive expression of output voltage.
- Draw high frequency equivalent circuit of op-amp & obtain expression for  $A_{OL(f)}$  open loop gain as function of frequency.

**Section II**

**Q.4 Answer any four questions.** **16**

- Explain with neat diagram operation of window detector using op-amp.
- Draw & Explain op-amp precision full wave rectifier with i/p & o/p waveforms.
- Design RC phase shift oscillator using op-amp 741 for output frequency of 200 Hz.  
 (Assume  $C = 0.1 \mu F$ )
- Explain op-amp square wave generator with circuit diagram & waveforms.
- Explain mono stable multi vibrator using IC 555 with equation for output.

**Q.5 Answer any two questions.**

- a)** Explain op-amp triangular wave generator with circuit diagram & waveforms.
- b)** Design & explain first order low pass filter at cutoff frequency of 1 KHz with a pass band gain of 2.
- c)** Calculate  $V_{ut}$ ,  $V_{lt}$ , hysteresis voltage & draw o/p waveform for op-amp Schmitt trigger circuit With  $V_{in} = 1$  Vp-p sine wave signal,  $\pm V_{cc} = 15$  Volt,  $R_1 = 100 \Omega$ ,  $R_2 = 56 \text{ k}\Omega$  & IC 741.

# S



- 10) Differential voltage gain of DIBO differential amplifier is \_\_\_\_\_.
  - a)  $R_c/2r_e$
  - b)  $2R_c/r_e$
  - c)  $R_c/r_e$
  - d)  $2\beta_{ac} r_e$
- 11) What should be maximum bandwidth for a gain of 10 in case of IC 741?
  - a) 1 MHz
  - b) 100 KHz
  - c) 10 KHz
  - d) 1 KHz
- 12) The type of feedback used in closed loop inverting amplifier is \_\_\_\_\_.
  - a) Voltage series
  - b) Current series
  - c) Current shunt
  - d) Voltage shunt
- 13)  $\pm V_{sat} / (1+AB)$  is total output offset voltage for \_\_\_\_\_.
  - a) Inverting amplifier
  - b) Non- Inverting amplifier
  - c) Both b & a
  - d) None of these
- 14) I to V converter is special case of \_\_\_\_\_ amplifier.
  - a) Non-inverting
  - b) Inverting
  - c) Differential
  - d) Scaling

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Set **S**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks

**Section – I**

**Q.2 Attempt any four.** **16**

- Derive equations for  $I_{CQ}$  &  $V_{CEQ}$  of Dual input balanced output differential amplifier using transistors.
- Derive equation for ideal voltage gain of Inverting amplifier using virtual ground concept.
- Define any four electrical parameters of IC 741 with practical & ideal values.
- Explain basic integrator with i/p & o/p waveforms.
- For Inverting amplifier with feedback using IC 741,  $R_1 = 470 \Omega$  &  $R_F = 4.7 K \Omega$ . Calculate the values for  $A_F$ ,  $R_{iF}$ ,  $R_{oF}$  &  $f_F$ .  
 (For IC 741 Assume  $A = 200000$ ,  $R_i = 2M \Omega$ ,  $R_o = 75 \Omega$  &  $f_o = 5 Hz$ )

**Q.3 Attempt any two.** **12**

- Derive expressions for gain  $A_d$  for DIBO differential amplifier using AC equivalent circuit.
- Explain instrumentation amplifier with transducer bridge & derive expression of output voltage.
- Draw high frequency equivalent circuit of op-amp & obtain expression for  $A_{OL(f)}$  open loop gain as function of frequency.

**Section II**

**Q.4 Answer any four questions.** **16**

- Explain with neat diagram operation of window detector using op-amp.
- Draw & Explain op-amp precision full wave rectifier with i/p & o/p waveforms.
- Design RC phase shift oscillator using op-amp 741 for output frequency of 200 Hz.  
 (Assume  $C = 0.1 \mu F$ )
- Explain op-amp square wave generator with circuit diagram & waveforms.
- Explain mono stable multi vibrator using IC 555 with equation for output.

**Q.5 Answer any two questions.**

- a)** Explain op-amp triangular wave generator with circuit diagram & waveforms.
- b)** Design & explain first order low pass filter at cutoff frequency of 1 KHz with a pass band gain of 2.
- c)** Calculate  $V_{ut}$ ,  $V_{lt}$ , hysteresis voltage & draw o/p waveform for op-amp Schmitt trigger circuit With  $V_{in} = 1$  Vp-p sine wave signal,  $\pm V_{cc} = 15$  Volt,  $R_1 = 100 \Omega$ ,  $R_2 = 56 \text{ k}\Omega$  & IC 741.

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**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) Which is the greatest disadvantage of Pulse Code Modulation?
  - a) Highly prone to noise
  - b) Cannot travel long distances
  - c) Its inability to handle analog signals
  - d) large bandwidth is required for it
- 2) In a uni-polar RZ format, \_\_\_\_\_.
  - a) The waveform has zero value for symbol '0'
  - b) The waveform has A volts for symbol '1'
  - c) The waveform has positive and negative values for '1' and '0' symbol respectively
  - d) Both a) and b) are correct
- 3) Information rate is defined as \_\_\_\_\_.
  - a) Information per unit time
  - b) Average number of bits of information per second
  - c) rH
  - d) All of the above
- 4) In Delta Modulation, the bit rate is \_\_\_\_\_.
  - a) N times the sampling frequency
  - b) N times the modulating frequency
  - c) N times the nyquist criteria
  - d) None of the above
- 5) FSK reception is \_\_\_\_\_.
  - a) Phase Coherent
  - b) Phase non coherent
  - c) Phase Coherent & non coherent
  - d) None of the mentioned
- 6) In On- Off keying, the carrier signal is transmitted with signal value 1 and '0' indicates \_\_\_\_\_.
 

|                                   |                               |
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| a) No carrier                     | b) Half the carrier amplitude |
| c) Amplitude of modulating signal | d) None of the above          |

- 7) ASK modulated signal has the bandwidth \_\_\_\_\_.  
a) Same as the bandwidth of baseband signal  
b) Half the bandwidth of baseband signal  
c) Double the bandwidth of baseband signal  
d) None of the above
- 8) The bit rate of digital communication system is M Kbps. The modulation used is 16QAM. The minimum bandwidth required for ideal transmission is \_\_\_\_\_.  
a) M/12 KHz  
b) M/16 KHz  
c) M/2 KHz  
d) M/22 KHz
- 9) The modulation normally used with digital data is \_\_\_\_\_.  
a) FM  
b) AM  
c) SSB  
d) QPSK
- 10) Matched filter is \_\_\_\_\_ technique.  
a) Modulation  
b) Demodulation  
c) Modulation & Demodulation  
d) None of the above
- 11) QPSK system uses a phase shift of \_\_\_\_\_.  
a)  $\pi$   
b)  $\pi/2$   
c)  $\pi/4$   
d)  $2\pi$
- 12) A correlation receiver consists of \_\_\_\_\_.  
a) a multiplier and integrator  
b) an integrator only  
c) Multiplier  
d) None of the above
- 13) In Adaptive Delta Modulation, the slope error reduces and \_\_\_\_\_.  
a) Quantization error decreases  
b) Quantization error increases  
c) Quantization error remains same  
d) None of the above
- 14) Nyquist criterion helps in \_\_\_\_\_.  
a) Transmitting the signal without ISI  
b) Reduction in transmission bandwidth  
c) Increase in transmission bandwidth  
d) Receiving the signal without ISI

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Set **P**

**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

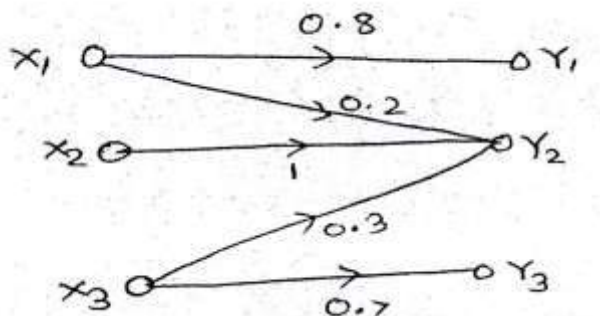
**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Attempt any Four.****16**

- Define the terms: Channel Capacity & Mutual Information.
- With the help of neat sketch explain eye Pattern.
- Explain Uniform & Non uniform quantization.
- With the help of block diagram explain DPSK.
- Compare Analog & Digital system

**Q.3 Attempt any Two.****12**

- With the help of block diagram explain working of Adaptive delta modulation. What are its advantages?
- With the help of block diagram & waveform explain FSK Modulation technique.
- The Discrete source transmits message  $X_1$ ,  $X_2$  &  $X_3$  with probabilities 0.3, 0.4 & 0.3 respectively. The source is connected to channel given in fig. Calculate all Entropy.

**Section – II****Q.4 Attempt any Four.****16**

- Explain Operation of QPSK transmitter along with the constellation diagram.
- Write Short Note on QAM Signaling Scheme.
- With the help of block diagram explain optimum receiver.
- Explain Frame synchronization in detail
- What is Syndrome testing? Explain it with detail.

**Q.5 Attempt any two.**

- a) Define Synchronization. With the help of block diagram explain symbol synchronization.
- b) Explain M-Ary differential PSK transmitter & receiver.
- c) Define linear codes. The generator matrix for (6,3) block code is given below. Find out all code vectors for this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

**Seat  
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**Set Q**

## Max. Marks: 70

Marks: 14

- a) Transmitting the signal without ISI
- b) Reduction in transmission bandwidth
- c) Increase in transmission bandwidth
- d) Receiving the signal without ISI



- 8) Which is the greatest disadvantage of Pulse Code Modulation?
- a) Highly prone to noise
  - b) Cannot travel long distances
  - c) Its inability to handle analog signals
  - d) large bandwidth is required for it
- 9) In a uni-polar RZ format, \_\_\_\_\_.  
a) The waveform has zero value for symbol '0'  
b) The waveform has A volts for symbol '1'  
c) The waveform has positive and negative values for '1' and '0' symbol respectively  
d) Both a) and b) are correct
- 10) Information rate is defined as \_\_\_\_\_.  
a) Information per unit time  
b) Average number of bits of information per second  
c) rH  
d) All of the above
- 11) In Delta Modulation, the bit rate is \_\_\_\_\_.  
a) N times the sampling frequency  
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- 13) In On- Off keying, the carrier signal is transmitted with signal value 1 and '0' indicates \_\_\_\_\_.  
a) No carrier  
b) Half the carrier amplitude  
c) Amplitude of modulating signal  
d) None of the above
- 14) ASK modulated signal has the bandwidth \_\_\_\_\_.  
a) Same as the bandwidth of baseband signal  
b) Half the bandwidth of baseband signal  
c) Double the bandwidth of baseband signal  
d) None of the above

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Set **Q**

**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

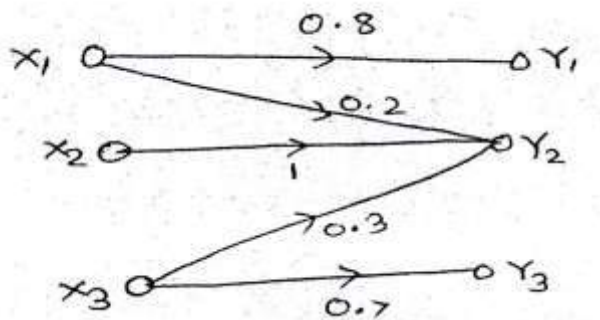
**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Attempt any Four.****16**

- Define the terms: Channel Capacity & Mutual Information.
- With the help of neat sketch explain eye Pattern.
- Explain Uniform & Non uniform quantization.
- With the help of block diagram explain DPSK.
- Compare Analog & Digital system

**Q.3 Attempt any Two.****12**

- With the help of block diagram explain working of Adaptive delta modulation. What are its advantages?
- With the help of block diagram & waveform explain FSK Modulation technique.
- The Discrete source transmits message  $X_1$ ,  $X_2$  &  $X_3$  with probabilities 0.3, 0.4 & 0.3 respectively. The source is connected to channel given in fig. Calculate all Entropy.

**Section – II****Q.4 Attempt any Four.****16**

- Explain Operation of QPSK transmitter along with the constellation diagram.
- Write Short Note on QAM Signaling Scheme.
- With the help of block diagram explain optimum receiver.
- Explain Frame synchronization in detail
- What is Syndrome testing? Explain it with detail.

**Q.5 Attempt any two.**

- a) Define Synchronization. With the help of block diagram explain symbol synchronization.
- b) Explain M-Ary differential PSK transmitter & receiver.
- c) Define linear codes. The generator matrix for (6,3) block code is given below. Find out all code vectors for this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

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Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) QPSK system uses a phase shift of \_\_\_\_\_.  
a)  $\pi$   
b)  $\pi/2$   
c)  $\pi/4$   
d)  $2\pi$
- 2) A correlation receiver consists of \_\_\_\_\_.  
a) a multiplier and integrator  
b) an integrator only  
c) Multiplier  
d) None of the above
- 3) In Adaptive Delta Modulation, the slope error reduces and \_\_\_\_\_.  
a) Quantization error decreases  
b) Quantization error increases  
c) Quantization error remains same  
d) None of the above
- 4) Nyquist criterion helps in \_\_\_\_\_.  
a) Transmitting the signal without ISI  
b) Reduction in transmission bandwidth  
c) Increase in transmission bandwidth  
d) Receiving the signal without ISI
- 5) Which is the greatest disadvantage of Pulse Code Modulation?  
a) Highly prone to noise  
b) Cannot travel long distances  
c) Its inability to handle analog signals  
d) large bandwidth is required for it
- 6) In a uni-polar RZ format, \_\_\_\_\_.  
a) The waveform has zero value for symbol '0'  
b) The waveform has A volts for symbol '1'  
c) The waveform has positive and negative values for '1' and '0' symbol respectively  
d) Both a) and b) are correct

- 7) Information rate is defined as \_\_\_\_\_.  
a) Information per unit time  
b) Average number of bits of information per second  
c) rH  
d) All of the above
- 8) In Delta Modulation, the bit rate is \_\_\_\_\_.  
a) N times the sampling frequency  
b) N times the modulating frequency  
c) N times the nyquist criteria  
d) None of the above
- 9) FSK reception is \_\_\_\_\_.  
a) Phase Coherent  
b) Phase non coherent  
c) Phase Coherent & non coherent  
d) None of the mentioned
- 10) In On- Off keying, the carrier signal is transmitted with signal value 1 and '0' indicates \_\_\_\_\_.  
a) No carrier  
b) Half the carrier amplitude  
c) Amplitude of modulating signal  
d) None of the above
- 11) ASK modulated signal has the bandwidth \_\_\_\_\_.  
a) Same as the bandwidth of baseband signal  
b) Half the bandwidth of baseband signal  
c) Double the bandwidth of baseband signal  
d) None of the above
- 12) The bit rate of digital communication system is M Kbps. The modulation used is 16QAM. The minimum bandwidth required for ideal transmission is \_\_\_\_\_.  
a) M/12 KHz  
b) M/16 KHz  
c) M/2 KHz  
d) M/22 KHz
- 13) The modulation normally used with digital data is \_\_\_\_\_.  
a) FM  
b) AM  
c) SSB  
d) QPSK
- 14) Matched filter is \_\_\_\_\_ technique.  
a) Modulation  
b) Demodulation  
c) Modulation & Demodulation  
d) None of the above

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Set **R**

**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

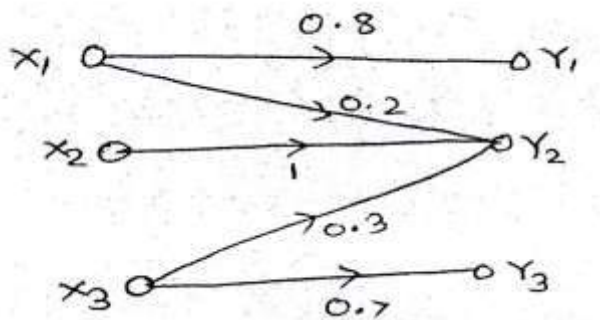
**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Attempt any Four.****16**

- Define the terms: Channel Capacity & Mutual Information.
- With the help of neat sketch explain eye Pattern.
- Explain Uniform & Non uniform quantization.
- With the help of block diagram explain DPSK.
- Compare Analog & Digital system

**Q.3 Attempt any Two.****12**

- With the help of block diagram explain working of Adaptive delta modulation. What are its advantages?
- With the help of block diagram & waveform explain FSK Modulation technique.
- The Discrete source transmits message  $X_1$ ,  $X_2$  &  $X_3$  with probabilities 0.3, 0.4 & 0.3 respectively. The source is connected to channel given in fig. Calculate all Entropy.

**Section – II****Q.4 Attempt any Four.****16**

- Explain Operation of QPSK transmitter along with the constellation diagram.
- Write Short Note on QAM Signaling Scheme.
- With the help of block diagram explain optimum receiver.
- Explain Frame synchronization in detail
- What is Syndrome testing? Explain it with detail.

**Q.5 Attempt any two.**

- a) Define Synchronization. With the help of block diagram explain symbol synchronization.
- b) Explain M-Ary differential PSK transmitter & receiver.
- c) Define linear codes. The generator matrix for (6,3) block code is given below. Find out all code vectors for this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

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Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14**

- 1) In On- Off keying, the carrier signal is transmitted with signal value 1 and '0' indicates \_\_\_\_\_.  
a) No carrier  
b) Half the carrier amplitude  
c) Amplitude of modulating signal  
d) None of the above
- 2) ASK modulated signal has the bandwidth \_\_\_\_\_.  
a) Same as the bandwidth of baseband signal  
b) Half the bandwidth of baseband signal  
c) Double the bandwidth of baseband signal  
d) None of the above
- 3) The bit rate of digital communication system is M Kbps. The modulation used is 16QAM. The minimum bandwidth required for ideal transmission is \_\_\_\_\_.  
a)  $M/12$  KHz  
b)  $M/16$  KHz  
c)  $M/2$  KHz  
d)  $M/22$  KHz
- 4) The modulation normally used with digital data is \_\_\_\_\_.  
a) FM  
b) AM  
c) SSB  
d) QPSK
- 5) Matched filter is \_\_\_\_\_ technique.  
a) Modulation  
b) Demodulation  
c) Modulation & Demodulation  
d) None of the above
- 6) QPSK system uses a phase shift of \_\_\_\_\_.  
a)  $\pi$   
b)  $\pi/2$   
c)  $\pi/4$   
d)  $2\pi$
- 7) A correlation receiver consists of \_\_\_\_\_.  
a) a multiplier and integrator  
b) an integrator only  
c) Multiplier  
d) None of the above



- 8) In Adaptive Delta Modulation, the slope error reduces and \_\_\_\_\_.  
a) Quantization error decreases  
b) Quantization error increases  
c) Quantization error remains same  
d) None of the above
- 9) Nyquist criterion helps in \_\_\_\_\_.  
a) Transmitting the signal without ISI  
b) Reduction in transmission bandwidth  
c) Increase in transmission bandwidth  
d) Receiving the signal without ISI
- 10) Which is the greatest disadvantage of Pulse Code Modulation?  
a) Highly prone to noise  
b) Cannot travel long distances  
c) Its inability to handle analog signals  
d) large bandwidth is required for it
- 11) In a uni-polar RZ format, \_\_\_\_\_.  
a) The waveform has zero value for symbol '0'  
b) The waveform has A volts for symbol '1'  
c) The waveform has positive and negative values for '1' and '0' symbol respectively  
d) Both a) and b) are correct
- 12) Information rate is defined as \_\_\_\_\_.  
a) Information per unit time  
b) Average number of bits of information per second  
c) rH  
d) All of the above
- 13) In Delta Modulation, the bit rate is \_\_\_\_\_.  
a) N times the sampling frequency  
b) N times the modulating frequency  
c) N times the nyquist criteria  
d) None of the above
- 14) FSK reception is \_\_\_\_\_.  
a) Phase Coherent  
b) Phase non coherent  
c) Phase Coherent & non coherent  
d) None of the mentioned

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Set **S**

**S.Y (B. Tech) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

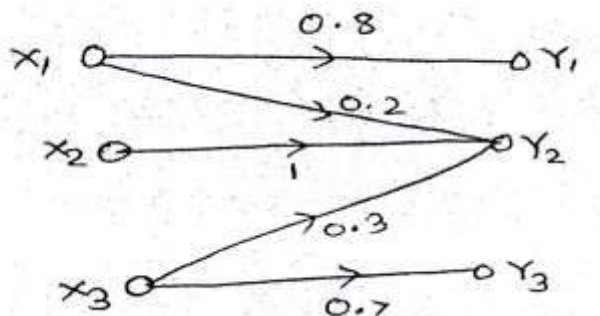
**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Attempt any Four.****16**

- Define the terms: Channel Capacity & Mutual Information.
- With the help of neat sketch explain eye Pattern.
- Explain Uniform & Non uniform quantization.
- With the help of block diagram explain DPSK.
- Compare Analog & Digital system

**Q.3 Attempt any Two.****12**

- With the help of block diagram explain working of Adaptive delta modulation. What are its advantages?
- With the help of block diagram & waveform explain FSK Modulation technique.
- The Discrete source transmits message  $X_1$ ,  $X_2$  &  $X_3$  with probabilities 0.3, 0.4 & 0.3 respectively. The source is connected to channel given in fig. Calculate all Entropy.

**Section – II****Q.4 Attempt any Four.****16**

- Explain Operation of QPSK transmitter along with the constellation diagram.
- Write Short Note on QAM Signaling Scheme.
- With the help of block diagram explain optimum receiver.
- Explain Frame synchronization in detail
- What is Syndrome testing? Explain it with detail.

**Q.5 Attempt any two.**

- a) Define Synchronization. With the help of block diagram explain symbol synchronization.
- b) Explain M-Ary differential PSK transmitter & receiver.
- c) Define linear codes. The generator matrix for (6,3) block code is given below. Find out all code vectors for this code.

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Shifting property of impulse is  $X[n] * \delta[n - n_0] =$ 
  - a)  $X[n]$
  - b)  $\delta[n]$
  - c)  $X[n - n_0]$
  - d)  $\delta[n - n_0]$
- 2) The system  $y(t) = x^2(t) + 6$  is \_\_\_\_\_.
  - a) Linear
  - b) Non Linear
  - c) Invertible
  - d) None of these
- 3) The system  $y[n] = x[-n]$  is \_\_\_\_\_.
  - a) Time variant
  - b) Time invariant
  - c) Both
  - d) None of these
- 4) Given sequence  $x_1[n] = \{1, -2, 3, 1\}$  &  $x_2[n] = \{2, -3, -2\}$  then their convolution  $y[n]$  is
  - a)  $\{2, -7, 10, -7\}$
  - b)  $\{2, -7, 10, -3, -9, -2\}$
  - c)  $\{10, -7, -9, 2\}$
  - d)  $\{2, -7, 10, -7, 9\}$
- 5) Odd signal satisfies
  - a)  $x(-t) = x(t)$
  - b)  $x[-n] = -x[n]$
  - c)  $x[n + 1] = a x[n] + b$
  - d)  $dx(t)/dt = \text{constant}$
- 6) Energy signals are the signals with \_\_\_\_\_.
  - a)  $0 < E < \infty, P = 0$
  - b)  $0 < E < \infty, P = \infty$
  - c)  $0 < P < \infty, E = \infty$
  - d)  $0 < P < \infty, E = 0$
- 7) Any periodic signal may be called as \_\_\_\_\_.
  - a) Causal
  - b) Non Causal
  - c) Anti Causal
  - d) None of these
- 8) ROC of sequence  $x[n] = u[n]$  is \_\_\_\_\_.
  - a)  $|z| > 1$
  - b)  $|z| < 1$
  - c) No ROC
  - d)  $-1 < |z| < 1$
- 9) If a signal  $f(t)$  has energy  $E$ , the energy of  $f(2t)$  is
  - a)  $E$
  - b)  $E/2$
  - c)  $2E$
  - d)  $4E$

- 10) ZT reduces to FT when it is evaluated on \_\_\_\_\_ circle.  
a) Half  
b) Z  
c) Unit  
d) Imaginary
- 11) Following system is time invariant.  
a)  $y(t) = x(2t)$   
b)  $y(t) = x(t) + x(t - 1)$   
c)  $y(t) = x(t/2)$   
d)  $y(t) = x(-t)$
- 12) Sampled frequency less than Nyquist rate is called \_\_\_\_\_ sampling.  
a) Under  
b) Over  
c) Critical  
d) None.
- 13) According to properties of ZT, ROC cannot contain.  
a) Zeros  
b) Poles  
c) Both  
d) None
- 14) Unit ramp signal can be expressed as  
a)  $u(t) + t$   
b)  $u(t) - t$   
c)  $u(t)/t$   
d)  $t \cdot u(t)$

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Set **P**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

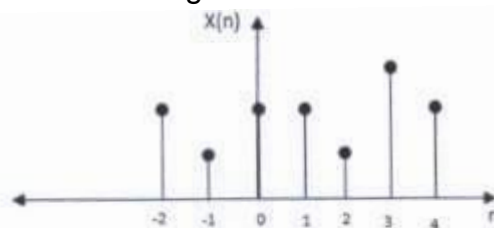
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Attempt any Four.****16**

- 1) Sketch given signal  $y(t) = r(t - 1) + u(t)$ .
- 2) Find even & odd component of  $x(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$ .
- 3) Obtain direct form I structure of system described by  

$$y(n) - (2/3)y(n-1) + (1/5)y(n-2) = x(n) + 2x(n-1)$$
- 4) Determine energy of signal.  $X[n] = (1/2)^n u(n)$ .
- 5) Let  $x[n] = 0$  for  $n < -2$  and  $n > 4$ . For each signal given below determine values of  $n$  for which it is guaranteed to be zero.

- i)  $x[n-3]$
- ii)  $x[n+4]$
- iii)  $x[-n]$
- iv)  $x[-n+2]$

**Q.3 Attempt any two:****12**

- 1) Determine convolution of following signals. Sketch result.  

$$y(n) = (0.5)^n u[n] \quad x(n) = u[n]$$
- 2) Determine whether following system is 1. Static or Dynamic 2. Linear or nonlinear 3. Time variant or time in variant 4. Causal or Non-causal 5. Stable or Unstable.  $y(t) = 10 x(t) + 5$
- 3) Find even and odd part of signal  $x[n] = \{3, 2, 1, 1, 1, 2, 1, 1\}$

**Section – II****Q.4 Attempt any Four.****16**

- 1) State & Prove convolution property of Fourier Transform.
- 2) Find Z.T. with its ROC for  $x(n) = (a^n)u[n]$ .
- 3) Find F.T of  $x(t) = e^{-at}u(t)$ .
- 4) Find Nyquist sampling rate for  $x(t) = 5 \cos(1000 \pi t), \cos(6000 \pi t)$ .
- 5) The analog signal  $m(t)$  is given below. Calculate Nyquist sampling rate.  

$$m(t) = 4 \cos(50 \pi t) + 8 \sin(300 \pi t) - \cos(100 \pi t)$$

**Q.5 Attempt any two:**

- 1) The analog signal given below is  $m(t) = 4 \cos 100 \pi t$ .
  - a) Calculate Nyquist rate
  - b) What is DT signal after sampling for
    - 1)  $F_s = 200 \text{ Hz}$
    - 2)  $F_s = 75 \text{ Hz}$ .
- 2) Find Fourier series coefficient using trigonometric Fourier series method for Full wave rectified signal with fundamental frequency  $\omega_0 = \pi$ .
- 3) Determine the sequence  $x(n)$  associated with  $ZT$  given below using power series method.  $X(Z) = (Z^2 + Z)/(Z^3 - 3Z^2 + 3Z - 1)$ ; Right handed sequence.

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Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 5 of 16





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Set **Q**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

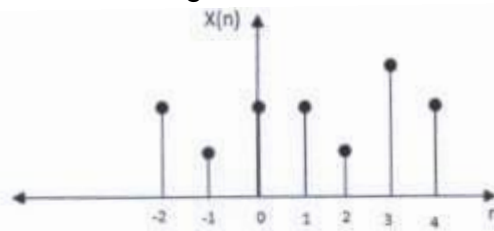
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Attempt any Four.****16**

- 1) Sketch given signal  $y(t) = r(t - 1) + u(t)$ .
- 2) Find even & odd component of  $x(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$ .
- 3) Obtain direct form I structure of system described by  

$$y(n) - (2/3)y(n-1) + (1/5)y(n-2) = x(n) + 2x(n-1)$$
- 4) Determine energy of signal.  $X[n] = (1/2)^n u(n)$ .
- 5) Let  $x[n] = 0$  for  $n < -2$  and  $n > 4$ . For each signal given below determine values of  $n$  for which it is guaranteed to be zero.

- i)  $x[n-3]$
- ii)  $x[n+4]$
- iii)  $x[-n]$
- iv)  $x[-n+2]$

**Q.3 Attempt any two:****12**

- 1) Determine convolution of following signals. Sketch result.  
 $y(n) = (0.5)^n u[n]$        $x(n) = u[n]$
- 2) Determine whether following system is 1. Static or Dynamic 2. Linear or nonlinear 3. Time variant or time invariant 4. Causal or Non-causal 5. Stable or Unstable.  $y(t) = 10x(t) + 5$
- 3) Find even and odd part of signal  $x[n] = \{3, 2, 1, 1, 1, 2, 1, 1\}$

**Section – II****Q.4 Attempt any Four.****16**

- 1) State & Prove convolution property of Fourier Transform.
- 2) Find Z.T. with its ROC for  $x(n) = (a^n)u[n]$ .
- 3) Find F.T of  $x(t) = e^{-at}u(t)$ .
- 4) Find Nyquist sampling rate for  $x(t) = 5 \cos(1000\pi t), \cos(6000\pi t)$ .
- 5) The analog signal  $m(t)$  is given below. Calculate Nyquist sampling rate.  

$$m(t) = 4 \cos(50\pi t) + 8 \sin(300\pi t) - \cos(100\pi t)$$

**Q.5 Attempt any two:**

- 1) The analog signal given below is  $m(t) = 4 \cos 100 \pi t$ .
  - a) Calculate Nyquist rate
  - b) What is DT signal after sampling for
    - 1)  $F_s = 200 \text{ Hz}$
    - 2)  $F_s = 75 \text{ Hz}$ .
- 2) Find Fourier series coefficient using trigonometric Fourier series method for Full wave rectified signal with fundamental frequency  $\omega_0 = \pi$ .
- 3) Determine the sequence  $x(n)$  associated with  $ZT$  given below using power series method.  $X(Z) = (Z^2 + Z)/(Z^3 - 3Z^2 + 3Z - 1)$ ; Right handed sequence.

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Following system is time invariant.
 

|                    |                             |
|--------------------|-----------------------------|
| a) $y(t) = x(2t)$  | b) $y(t) = x(t) + x(t - 1)$ |
| c) $y(t) = x(t/2)$ | d) $y(t) = x(-t)$           |
- 2) Sampled frequency less than Nyquist rate is called \_\_\_\_\_ sampling.
 

|             |          |
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| a) Under    | b) Over  |
| c) Critical | d) None. |
- 3) According to properties of ZT, ROC cannot contain.
 

|          |          |
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| a) Zeros | b) Poles |
| c) Both  | d) None  |
- 4) Unit ramp signal can be expressed as
 

|               |               |
|---------------|---------------|
| a) $u(t) + t$ | b) $u(t) - t$ |
| c) $u(t)/t$   | d) $t.u(t)$   |
- 5) Shifting property of impulse is  $X[n] * \delta[n - n_0] =$ 

|                 |                      |
|-----------------|----------------------|
| a) $X[n]$       | b) $\delta[n]$       |
| c) $X[n - n_0]$ | d) $\delta[n - n_0]$ |
- 6) The system  $y(t) = x^2(t) + 6$  is \_\_\_\_\_.
 

|               |                  |
|---------------|------------------|
| a) Linear     | b) Non Linear    |
| c) Invertible | d) None of these |
- 7) The system  $y[n] = x[-n]$  is \_\_\_\_\_.
 

|                 |                   |
|-----------------|-------------------|
| a) Time variant | b) Time invariant |
| c) Both         | d) None of these  |
- 8) Given sequence  $x_1[n] = \{1, -2, 3, 1\}$  &  $x_2[n] = \{2, -3, -2\}$  then their convolution  $y[n]$  is
 

|                        |                                |
|------------------------|--------------------------------|
| a) $\{2, -7, 10, -7\}$ | b) $\{2, -7, 10, -3, -9, -2\}$ |
| c) $\{10, -7, -9, 2\}$ | d) $\{2, -7, 10, -7, 9\}$      |
- 9) Odd signal satisfies
 

|                            |                                 |
|----------------------------|---------------------------------|
| a) $x(-t) = x(t)$          | b) $x[-n] = -x[n]$              |
| c) $x[n + 1] = a x[n] + b$ | d) $dx(t)/dt = \text{constant}$ |



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

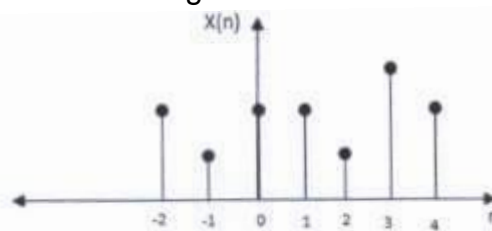
**Q.2 Attempt any Four.**

**16**

- 1) Sketch given signal  $y(t) = r(t - 1) + u(t)$ .
- 2) Find even & odd component of  $x(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$ .
- 3) Obtain direct form I structure of system described by  

$$y(n) - (2/3)y(n-1) + (1/5)y(n-2) = x(n) + 2x(n-1)$$
- 4) Determine energy of signal.  $X[n] = (1/2)^n u(n)$ .
- 5) Let  $x[n] = 0$  for  $n < -2$  and  $n > 4$ . For each signal given below determine values of  $n$  for which it is guaranteed to be zero.

- i)  $x[n-3]$
- ii)  $x[n+4]$
- iii)  $x[-n]$
- iv)  $x[-n+2]$



**Q.3 Attempt any two:**

**12**

- 1) Determine convolution of following signals. Sketch result.  
 $y(n) = (0.5)^n u[n]$        $x(n) = u[n]$
- 2) Determine whether following system is 1. Static or Dynamic 2. Linear or nonlinear 3. Time variant or time invariant 4. Causal or Non-causal 5. Stable or Unstable.  $y(t) = 10x(t) + 5$
- 3) Find even and odd part of signal  $x[n] = \{3, 2, 1, 1, 1, 2, 1, 1\}$

**Section – II**

**Q.4 Attempt any Four.**

**16**

- 1) State & Prove convolution property of Fourier Transform.
- 2) Find Z.T. with its ROC for  $x(n) = (a^n)u[n]$ .
- 3) Find F.T of  $x(t) = e^{-at}u(t)$ .
- 4) Find Nyquist sampling rate for  $x(t) = 5 \cos(1000\pi t) \cos(6000\pi t)$ .
- 5) The analog signal  $m(t)$  is given below. Calculate Nyquist sampling rate.  

$$m(t) = 4 \cos(50\pi t) + 8 \sin(300\pi t) - \cos(100\pi t)$$

**Q.5 Attempt any two:**

- 1) The analog signal given below is  $m(t) = 4 \cos 100 \pi t$ .
  - a) Calculate Nyquist rate
  - b) What is DT signal after sampling for
    - 1)  $F_s = 200 \text{ Hz}$
    - 2)  $F_s = 75 \text{ Hz}$ .
- 2) Find Fourier series coefficient using trigonometric Fourier series method for Full wave rectified signal with fundamental frequency  $\omega_0 = \pi$ .
- 3) Determine the sequence  $x(n)$  associated with  $ZT$  given below using power series method.  $X(Z) = (Z^2 + Z)/(Z^3 - 3Z^2 + 3Z - 1)$ ; Right handed sequence.

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- 10) Shifting property of impulse is  $X[n] * \delta[n - n_0] =$   
a)  $X[n]$  b)  $\delta[n]$   
c)  $X[n - n_0]$  d)  $\delta[n - n_0]$
- 11) The system  $y(t) = x^2(t) + 6$  is \_\_\_\_\_.  
a) Linear b) Non Linear  
c) Invertible d) None of these
- 12) The system  $y[n] = x[-n]$  is \_\_\_\_\_.  
a) Time variant b) Time invariant  
c) Both d) None of these
- 13) Given sequence  $x_1[n] = \{1, -2, 3, 1\}$  &  $x_2[n] = \{2, -3, -2\}$  then their convolution  $y[n]$  is  
a)  $\{2, -7, 10, -7\}$  b)  $\{2, -7, 10, -3, -9, -2\}$   
c)  $\{10, -7, -9, 2\}$  d)  $\{2, -7, 10, -7, 9\}$
- 14) Odd signal satisfies  
a)  $x(-t) = x(t)$  b)  $x[-n] = -x[n]$   
c)  $x[n + 1] = a x[n] + b$  d)  $dx(t)/dt = \text{constant}$

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Set **S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

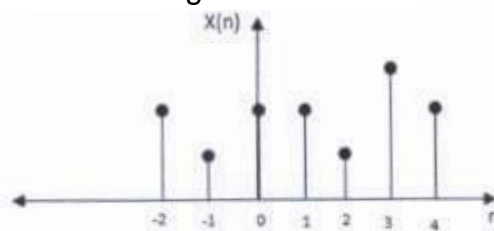
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Attempt any Four.****16**

- 1) Sketch given signal  $y(t) = r(t - 1) + u(t)$ .
- 2) Find even & odd component of  $x(t) = \cos(t) + \sin(t) + \cos(t) \cdot \sin(t)$ .
- 3) Obtain direct form I structure of system described by  

$$y(n) - (2/3)y(n-1) + (1/5)y(n-2) = x(n) + 2x(n-1)$$
- 4) Determine energy of signal.  $X[n] = (1/2)^n u(n)$ .
- 5) Let  $x[n] = 0$  for  $n < -2$  and  $n > 4$ . For each signal given below determine values of  $n$  for which it is guaranteed to be zero.

- i)  $x[n-3]$
- ii)  $x[n+4]$
- iii)  $x[-n]$
- iv)  $x[-n+2]$

**Q.3 Attempt any two:****12**

- 1) Determine convolution of following signals. Sketch result.  
 $y(n) = (0.5)^n u[n]$        $x(n) = u[n]$
- 2) Determine whether following system is 1. Static or Dynamic 2. Linear or nonlinear 3. Time variant or time invariant 4. Causal or Non-causal 5. Stable or Unstable.  $y(t) = 10x(t) + 5$
- 3) Find even and odd part of signal  $x[n] = \{3, 2, 1, 1, 1, 2, 1, 1\}$

**Section – II****Q.4 Attempt any Four.****16**

- 1) State & Prove convolution property of Fourier Transform.
- 2) Find Z.T. with its ROC for  $x(n) = (a^n)u[n]$ .
- 3) Find F.T of  $x(t) = e^{-at}u(t)$ .
- 4) Find Nyquist sampling rate for  $x(t) = 5 \cos(1000\pi t), \cos(6000\pi t)$ .
- 5) The analog signal  $m(t)$  is given below. Calculate Nyquist sampling rate.  

$$m(t) = 4 \cos(50\pi t) + 8 \sin(300\pi t) - \cos(100\pi t)$$

**Q.5 Attempt any two:**

- 1) The analog signal given below is  $m(t) = 4 \cos 100 \pi t$ .
  - a) Calculate Nyquist rate
  - b) What is DT signal after sampling for
    - 1)  $F_s = 200 \text{ Hz}$
    - 2)  $F_s = 75 \text{ hz}$ .
- 2) Find Fourier series coefficient using trigonometric Fourier series method for Full wave rectified signal with fundamental frequency  $\omega_0 = \pi$ .
- 3) Determine the sequence  $x(n)$  associated with  $ZT$  given below using power series method.  $X(Z) = (Z^2 + Z)/(Z^3 - 3Z^2 + 3Z - 1)$ ; Right handed sequence.

## Max. Marks: 70

Marks: 14

14

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Structures**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain the different Operations in data Structures.
- b) Define Expression representations with different representations techniques.
- c) What is mean by Queue? Explain with any one type of queue.
- d) Define Stack Applications.
- e) Convert Infix to Postfix form.  $(A+B/C*D)$

**Q.3 Solve any two of the following.** **12**

- a) Define Stack & its operations with any one algorithm.
- b) Explain Searching techniques with their complexity analysis.
- c) Define Asymptotic Notations in data structures.

**Section II**

**Q.4 Solve any four of the following.** **16**

- a) Explain Linked list with representation.
- b) Write short note on Trees.
- c) Explain the Advantages & Disadvantages of Linked list.
- d) Define Different types of Trees.
- e) Explain Basic Terminologies and Representations in Graph.

**Q.5 Solve any two of the following.** **12**

- a) Explain different types of linked list.
- b) Explain basics of hashing. Different Hashing techniques.
- c) Explain different types of sorting algorithms.

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Structures**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is an application of Stack Data Structure?
  - a) Backtracking
  - b) Expression evaluation
  - c) Expression conversion
  - d) All of the above
- 2) Which of the following is not the type of queue?
  - a) Priority queue
  - b) Single-ended queue
  - c) Circular queue
  - d) Simple Queue
- 3) Which of the following is a linear data structure?
  - a) Array
  - b) AVL Tree
  - c) Binary Tree
  - d) Graph
- 4) In Linked List implementation, a node carries information regarding \_\_\_\_\_.
  - a) Data
  - b) Link
  - c) Data and Link
  - d) Node
- 5) What is the number of edges present in a complete graph having n vertices?
  - a)  $(n * (n + 1))/2$
  - b)  $(n * (n - 1))/2$
  - c) n
  - d) Information given is insufficient
- 6) A B-tree of order 4 and of height 3 will have a maximum of \_\_\_\_\_ keys.
  - a) 255
  - b) 63
  - c) 127
  - d) 188
- 7) What is the maximum number of swaps that can be performed in the Selection Sort algorithm?
  - a) n-1
  - b) n-2
  - c) n
  - d) 1
- 8) Which of the following is the infix expression?
  - a) A+B\*C
  - b) +A\*BC
  - c) ABC+\*
  - d) None of above
- 9) When the user tries to delete the element from the empty stack then the condition is said to be a \_\_\_\_\_.
  - a) Underflow
  - b) Garbage collection
  - c) Overflow
  - d) None of the above

- 10)** With what data structure can a priority queue be implemented?
- a) Array
  - b) List
  - c) Heap
  - d) Tree
- 11)** How can we initialize an array in C language?
- a) `int arr[2] = (10, 20)`
  - b) `int arr(2) = {10, 20}`
  - c) `int arr[2] = {10, 20}`
  - d) `int arr(2) = (10, 20)`
- 12)** Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity?
- a) Insertion Sort
  - b) Quick Sort
  - c) Heap Sort
  - d) Merge Sort
- 13)** Linear search it is a \_\_\_\_\_.
- a) Circular search
  - b) Random search
  - c) Sequential search
  - d) None of the above
- 14)** What is the Worst case for binary search?
- a)  $O(\log n)$
  - b)  $O(n \log n)$
  - c)  $O(n)$
  - d)  $O(1)$



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Structures**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain the different Operations in data Structures.
- b) Define Expression representations with different representations techniques.
- c) What is mean by Queue? Explain with any one type of queue.
- d) Define Stack Applications.
- e) Convert Infix to Postfix form.  $(A+B/C*D)$

**Q.3 Solve any two of the following.** **12**

- a) Define Stack & its operations with any one algorithm.
- b) Explain Searching techniques with their complexity analysis.
- c) Define Asymptotic Notations in data structures.

**Section II**

**Q.4 Solve any four of the following.** **16**

- a) Explain Linked list with representation.
- b) Write short note on Trees.
- c) Explain the Advantages & Disadvantages of Linked list.
- d) Define Different types of Trees.
- e) Explain Basic Terminologies and Representations in Graph.

**Q.5 Solve any two of the following.** **12**

- a) Explain different types of linked list.
- b) Explain basics of hashing. Different Hashing techniques.
- c) Explain different types of sorting algorithms.

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Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks: 14

14

- Page 7 of 12

- 10) Linear search it is a \_\_\_\_\_.
  - a) Circular search
  - b) Random search
  - c) Sequential search
  - d) None of the above
- 11) What is the Worst case for binary search?
  - a)  $O(\log n)$
  - b)  $O(n \log n)$
  - c)  $O(n)$
  - d)  $O(1)$
- 12) Which of the following is an application of Stack Data Structure?
  - a) Backtracking
  - b) Expression evaluation
  - c) Expression conversion
  - d) All of the above
- 13) Which of the following is not the type of queue?
  - a) Priority queue
  - b) Single-ended queue
  - c) Circular queue
  - d) Simple Queue
- 14) Which of the following is a linear data structure?
  - a) Array
  - b) AVL Tree
  - c) Binary Tree
  - d) Graph

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Structures**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following. 16**

- a) Explain the different Operations in data Structures.
- b) Define Expression representations with different representations techniques.
- c) What is mean by Queue? Explain with any one type of queue.
- d) Define Stack Applications.
- e) Convert Infix to Postfix form.  $(A+B/C*D)$

**Q.3 Solve any two of the following. 12**

- a) Define Stack & its operations with any one algorithm.
- b) Explain Searching techniques with their complexity analysis.
- c) Define Asymptotic Notations in data structures.

**Section II**

**Q.4 Solve any four of the following. 16**

- a) Explain Linked list with representation.
- b) Write short note on Trees.
- c) Explain the Advantages & Disadvantages of Linked list.
- d) Define Different types of Trees.
- e) Explain Basic Terminologies and Representations in Graph.

**Q.5 Solve any two of the following. 12**

- a) Explain different types of linked list.
- b) Explain basics of hashing. Different Hashing techniques.
- c) Explain different types of sorting algorithms.

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Structures**

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Marks: 14

14

- Page 10 of 12

- 11) When the user tries to delete the element from the empty stack then the condition is said to be a \_\_\_\_\_.
  - a) Underflow
  - b) Garbage collection
  - c) Overflow
  - d) None of the above
- 12) With what data structure can a priority queue be implemented?
  - a) Array
  - b) List
  - c) Heap
  - d) Tree
- 13) How can we initialize an array in C language?
  - a) `int arr[2] = (10, 20)`
  - b) `int arr(2) = {10, 20}`
  - c) `int arr[2] = {10, 20}`
  - d) `int arr(2) = (10, 20)`
- 14) Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity?
  - a) Insertion Sort
  - b) Quick Sort
  - c) Heap Sort
  - d) Merge Sort

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Data Structures**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following.** **16**

- a) Explain the different Operations in data Structures.
- b) Define Expression representations with different representations techniques.
- c) What is mean by Queue? Explain with any one type of queue.
- d) Define Stack Applications.
- e) Convert Infix to Postfix form.  $(A+B/C*D)$

**Q.3 Solve any two of the following.** **12**

- a) Define Stack & its operations with any one algorithm.
- b) Explain Searching techniques with their complexity analysis.
- c) Define Asymptotic Notations in data structures.

**Section II**

**Q.4 Solve any four of the following.** **16**

- a) Explain Linked list with representation.
- b) Write short note on Trees.
- c) Explain the Advantages & Disadvantages of Linked list.
- d) Define Different types of Trees.
- e) Explain Basic Terminologies and Representations in Graph.

**Q.5 Solve any two of the following.** **12**

- a) Explain different types of linked list.
- b) Explain basics of hashing. Different Hashing techniques.
- c) Explain different types of sorting algorithms.

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Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Marks: 14

## 14

- 1) A process by which we estimate the value of dependent variable on the basis of one or more independent variables is called: \_\_\_\_\_.  
a) Correlation  
b) Regression  
c) Residual  
d) Slope
- 2) The slope of the regression line of Y on X is also called the: \_\_\_\_\_.  
a) Correlation coefficient of X on Y  
b) Correlation coefficient of Y on X  
c) Regression coefficient of X on Y  
d) Regression coefficient of Y on X
- 3) Prediction is \_\_\_\_\_.  
a) discipline in statistics used to find projections in multidimensional data  
b) value entered in database by expert  
c) the result of application of specific theory or rule in a specific case  
d) independent of data
- 4) Like the probabilistic view, the \_\_\_\_\_ view allows us to associate a Probability of membership with each classification.  
a) deductive  
b) exemplar  
c) classical  
d) inductive
- 5) In the example of predicting number of babies based on stork's population, Number of babies is \_\_\_\_\_.  
a) feature  
b) observation  
c) outcome  
d) attribute
- 6) Supervised learning and unsupervised clustering both require which is correct according to the statement.  
a) input attribute  
b) hidden attribute  
c) output attribute  
d) categorical attribute
- 7) Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?  
a) Gaussian Distribution  
b) Poisson Distribution  
c) Rayleigh Distribution  
d) Exponential Distribution



- 8) PCA is \_\_\_\_\_.  
a) backward feature selection      b) forward feature selection  
c) feature extraction      d) none of these
- 9) Mutually Exclusive events \_\_\_\_\_.  
a) Contain all sample points  
b) Contain all common sample points  
c) Does not contain any sample point  
d) Does not contain any common sample point
- 10) Impact of high variance on the training set?  
a) under fitting      b) over fitting  
c) both under fitting & over fitting      d) depends upon the dataset
- 11) What is an eigenvector?  
a) The proportion of the variance explained in the matrix  
b) A higher-order dimension that subsumes all of the lower-order errors  
c) A higher-order dimension that subsumes similar lower-order dimensions  
d) A higher-order dimension that subsumes all lower-order dimensions
- 12) A measurable property or parameter of the data-set is \_\_\_\_\_.  
a) training data      b) test data  
c) Feature      d) validation data
- 13) Which of the following techniques would perform better for reducing dimensions of a data set?  
a) removing columns which have high variance in data  
b) removing columns which have too many missing value  
c) removing columns with dissimilar data trends  
d) None of the above
- 14) What does dimensionality reduction reduce?  
a) collinearity      b) stochastic  
c) entropy      d) performance

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computational Statistics**

Day &amp; Date: Thursday, 16-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All Questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Explain the terms with example.
    - Sample space
    - Mutually exclusive events
    - Conditional Probability
  - Describe Bayes's theorem in details with an example
  - Discuss Conditional probability with an example in detail.
  - Explain the simple linear regression model in detail.
  - Discuss matrix factorization in detail.
- Q.3 Answer the following questions. (Any One) 06**
- Write a short note on Gaussian Distribution.
  - Explain Eigenvectors centrality in detail.
- Q.4 Explain the goodness of fitting in multiple regression model. 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**
- What are the important objectives of machine learning?
  - How do you design learning system? Explain with examples.
  - Differentiate between Training data and Testing Data.
  - Which are the applications of machine learning?
  - Differentiate between Supervised, Unsupervised and Reinforcement Learning.
- Q.6 Answer the following questions. (Any One) 06**
- What do you mean by a well -posed learning problem? Explain the important features that are required to well -define a learning problem.
  - Explain the significance of Dimensionality Reduction.
- Q.7 What is Bias, Variance and what do you mean by Bias-Variance Tradeoff? And Differentiate between overfitting & Underfitting. 06**

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) PCA is \_\_\_\_\_.
  - a) backward feature selection
  - b) forward feature selection
  - c) feature extraction
  - d) none of these
- 2) Mutually Exclusive events \_\_\_\_\_.
  - a) Contain all sample points
  - b) Contain all common sample points
  - c) Does not contain any sample point
  - d) Does not contain any common sample point
- 3) Impact of high variance on the training set?
  - a) under fitting
  - b) over fitting
  - c) both under fitting & over fitting
  - d) depends upon the dataset
- 4) What is an eigenvector?
  - a) The proportion of the variance explained in the matrix
  - b) A higher-order dimension that subsumes all of the lower-order errors
  - c) A higher-order dimension that subsumes similar lower-order dimensions
  - d) A higher-order dimension that subsumes all lower-order dimensions
- 5) A measurable property or parameter of the data-set is \_\_\_\_\_.
  - a) training data
  - b) test data
  - c) Feature
  - d) validation data
- 6) Which of the following techniques would perform better for reducing dimensions of a data set?
  - a) removing columns which have high variance in data
  - b) removing columns which have too many missing value
  - c) removing columns with dissimilar data trends
  - d) None of the above
- 7) What does dimensionality reduction reduce?
  - a) collinearity
  - b) stochastic
  - c) entropy
  - d) performance

- 8) A process by which we estimate the value of dependent variable on the basis of one or more independent variables is called: \_\_\_\_\_.
  - a) Correlation
  - b) Regression
  - c) Residual
  - d) Slope
- 9) The slope of the regression line of Y on X is also called the: \_\_\_\_\_.
  - a) Correlation coefficient of X on Y
  - b) Correlation coefficient of Y on X
  - c) Regression coefficient of X on Y
  - d) Regression coefficient of Y on X
- 10) Prediction is \_\_\_\_\_.
  - a) discipline in statistics used to find projections in multidimensional data
  - b) value entered in database by expert
  - c) the result of application of specific theory or rule in a specific case
  - d) independent of data
- 11) Like the probabilistic view, the \_\_\_\_\_ view allows us to associate a Probability of membership with each classification.
  - a) deductive
  - b) exemplar
  - c) classical
  - d) inductive
- 12) In the example of predicting number of babies based on stork's population, Number of babies is \_\_\_\_\_.
  - a) feature
  - b) observation
  - c) outcome
  - d) attribute
- 13) Supervised learning and unsupervised clustering both require which is correct according to the statement.
  - a) input attribute
  - b) hidden attribute
  - c) output attribute
  - d) categorical attribute
- 14) Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?
  - a) Gaussian Distribution
  - b) Poisson Distribution
  - c) Rayleigh Distribution
  - d) Exponential Distribution

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- a) Explain the terms with example.
    - 1) Sample space
    - 2) Mutually exclusive events
    - 3) Conditional Probability
  - b) Describe Bayes's theorem in details with an example
  - c) Discuss Conditional probability with an example in detail.
  - d) Explain the simple linear regression model in detail.
  - e) Discuss matrix factorization in detail.
- Q.3 Answer the following questions. (Any One) 06**
- a) Write a short note on Gaussian Distribution.
  - b) Explain Eigenvectors centrality in detail.
- Q.4 Explain the goodness of fitting in multiple regression model. 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**
- a) What are the important objectives of machine learning?
  - b) How do you design learning system? Explain with examples.
  - c) Differentiate between Training data and Testing Data.
  - d) Which are the applications of machine learning?
  - e) Differentiate between Supervised, Unsupervised and Reinforcement Learning.
- Q.6 Answer the following questions. (Any One) 06**
- a) What do you mean by a well -posed learning problem? Explain the important features that are required to well -define a learning problem.
  - b) Explain the significance of Dimensionality Reduction.
- Q.7 What is Bias, Variance and what do you mean by Bias-Variance Tradeoff? And Differentiate between overfitting & Underfitting. 06**

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is an eigenvector?
  - a) The proportion of the variance explained in the matrix
  - b) A higher-order dimension that subsumes all of the lower-order errors
  - c) A higher-order dimension that subsumes similar lower-order dimensions
  - d) A higher-order dimension that subsumes all lower-order dimensions
- 2) A measurable property or parameter of the data-set is \_\_\_\_\_.
  - a) training data
  - b) test data
  - c) Feature
  - d) validation data
- 3) Which of the following techniques would perform better for reducing dimensions of a data set?
  - a) removing columns which have high variance in data
  - b) removing columns which have too many missing value
  - c) removing columns with dissimilar data trends
  - d) None of the above
- 4) What does dimensionality reduction reduce?
  - a) collinearity
  - b) stochastic
  - c) entropy
  - d) performance
- 5) A process by which we estimate the value of dependent variable on the basis of one or more independent variables is called: \_\_\_\_\_.
  - a) Correlation
  - b) Regression
  - c) Residual
  - d) Slope
- 6) The slope of the regression line of Y on X is also called the: \_\_\_\_\_.
  - a) Correlation coefficient of X on Y
  - b) Correlation coefficient of Y on X
  - c) Regression coefficient of X on Y
  - d) Regression coefficient of Y on X

- 7) Prediction is \_\_\_\_\_.  
a) discipline in statistics used to find projections in multidimensional data  
b) value entered in database by expert  
c) the result of application of specific theory or rule in a specific case  
d) independent of data
- 8) Like the probabilistic view, the \_\_\_\_\_ view allows us to associate a Probability of membership with each classification.  
a) deductive  
b) exemplar  
c) classical  
d) inductive
- 9) In the example of predicting number of babies based on stork's population, Number of babies is \_\_\_\_\_.  
a) feature  
b) observation  
c) outcome  
d) attribute
- 10) Supervised learning and unsupervised clustering both require which is correct according to the statement.  
a) input attribute  
b) hidden attribute  
c) output attribute  
d) categorical attribute
- 11) Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?  
a) Gaussian Distribution  
b) Poisson Distribution  
c) Rayleigh Distribution  
d) Exponential Distribution
- 12) PCA is \_\_\_\_\_.  
a) backward feature selection  
b) forward feature selection  
c) feature extraction  
d) none of these
- 13) Mutually Exclusive events \_\_\_\_\_.  
a) Contain all sample points  
b) Contain all common sample points  
c) Does not contain any sample point  
d) Does not contain any common sample point
- 14) Impact of high variance on the training set?  
a) under fitting  
b) over fitting  
c) both under fitting & over fitting  
d) depends upon the dataset

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four)** **16**
- Explain the terms with example.
    - Sample space
    - Mutually exclusive events
    - Conditional Probability
  - Describe Bayes's theorem in details with an example
  - Discuss Conditional probability with an example in detail.
  - Explain the simple linear regression model in detail.
  - Discuss matrix factorization in detail.
- Q.3 Answer the following questions. (Any One)** **06**
- Write a short note on Gaussian Distribution.
  - Explain Eigenvectors centrality in detail.
- Q.4** Explain the goodness of fitting in multiple regression model. **06**

**Section – II**

- Q.5 Answer the following questions. (Any Four)** **16**
- What are the important objectives of machine learning?
  - How do you design learning system? Explain with examples.
  - Differentiate between Training data and Testing Data.
  - Which are the applications of machine learning?
  - Differentiate between Supervised, Unsupervised and Reinforcement Learning.
- Q.6 Answer the following questions. (Any One)** **06**
- What do you mean by a well -posed learning problem? Explain the important features that are required to well -define a learning problem.
  - Explain the significance of Dimensionality Reduction.
- Q.7** What is Bias, Variance and what do you mean by Bias-Variance Tradeoff? And Differentiate between overfitting & Underfitting. **06**



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Supervised learning and unsupervised clustering both require which is correct according to the statement.
 

|                     |                          |
|---------------------|--------------------------|
| a) input attribute  | b) hidden attribute      |
| c) output attribute | d) categorical attribute |
- 2) Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?
 

|                          |                             |
|--------------------------|-----------------------------|
| a) Gaussian Distribution | b) Poisson Distribution     |
| c) Rayleigh Distribution | d) Exponential Distribution |
- 3) PCA is \_\_\_\_\_.
 

|                               |                              |
|-------------------------------|------------------------------|
| a) backward feature selection | b) forward feature selection |
| c) feature extraction         | d) none of these             |
- 4) Mutually Exclusive events \_\_\_\_\_.
 

|                                             |
|---------------------------------------------|
| a) Contain all sample points                |
| b) Contain all common sample points         |
| c) Does not contain any sample point        |
| d) Does not contain any common sample point |
- 5) Impact of high variance on the training set?
 

|                                      |                             |
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| a) under fitting                     | b) over fitting             |
| c) both under fitting & over fitting | d) depends upon the dataset |
- 6) What is an eigenvector?
 

|                                                                          |
|--------------------------------------------------------------------------|
| a) The proportion of the variance explained in the matrix                |
| b) A higher-order dimension that subsumes all of the lower-order errors  |
| c) A higher-order dimension that subsumes similar lower-order dimensions |
| d) A higher-order dimension that subsumes all lower-order dimensions     |
- 7) A measurable property or parameter of the data-set is \_\_\_\_\_.
 

|                  |                    |
|------------------|--------------------|
| a) training data | b) test data       |
| c) Feature       | d) validation data |

- 8) Which of the following techniques would perform better for reducing dimensions of a data set?
- a) removing columns which have high variance in data
  - b) removing columns which have too many missing value
  - c) removing columns with dissimilar data trends
  - d) None of the above
- 9) What does dimensionality reduction reduce?
- a) collinearity
  - b) stochastic
  - c) entropy
  - d) performance
- 10) A process by which we estimate the value of dependent variable on the basis of one or more independent variables is called: \_\_\_\_\_.
- a) Correlation
  - b) Regression
  - c) Residual
  - d) Slope
- 11) The slope of the regression line of Y on X is also called the: \_\_\_\_\_.
- a) Correlation coefficient of X on Y
  - b) Correlation coefficient of Y on X
  - c) Regression coefficient of X on Y
  - d) Regression coefficient of Y on X
- 12) Prediction is \_\_\_\_\_.
- a) discipline in statistics used to find projections in multidimensional data
  - b) value entered in database by expert
  - c) the result of application of specific theory or rule in a specific case
  - d) independent of data
- 13) Like the probabilistic view, the \_\_\_\_\_ view allows us to associate a Probability of membership with each classification.
- a) deductive
  - b) exemplar
  - c) classical
  - d) inductive
- 14) In the example of predicting number of babies based on stork's population, Number of babies is \_\_\_\_\_.
- a) feature
  - b) observation
  - c) outcome
  - d) attribute

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Computational Statistics**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All Questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Explain the terms with example.
    - Sample space
    - Mutually exclusive events
    - Conditional Probability
  - Describe Bayes's theorem in details with an example
  - Discuss Conditional probability with an example in detail.
  - Explain the simple linear regression model in detail.
  - Discuss matrix factorization in detail.
- Q.3 Answer the following questions. (Any One) 06**
- Write a short note on Gaussian Distribution.
  - Explain Eigenvectors centrality in detail.
- Q.4 Explain the goodness of fitting in multiple regression model. 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**
- What are the important objectives of machine learning?
  - How do you design learning system? Explain with examples.
  - Differentiate between Training data and Testing Data.
  - Which are the applications of machine learning?
  - Differentiate between Supervised, Unsupervised and Reinforcement Learning.
- Q.6 Answer the following questions. (Any One) 06**
- What do you mean by a well -posed learning problem? Explain the important features that are required to well -define a learning problem.
  - Explain the significance of Dimensionality Reduction.
- Q.7 What is Bias, Variance and what do you mean by Bias-Variance Tradeoff? And Differentiate between overfitting & Underfitting. 06**

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Set **P**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which type of data can be stored in the database?
  - a) Image oriented data
  - b) Text, files containing data
  - c) Data in the form of audio or video
  - d) All of the above
- 2) What does an RDBMS consist of?
 

|                          |                         |
|--------------------------|-------------------------|
| a) Collection of Records | b) Collection of Keys   |
| c) Collection of Tables  | d) Collection of Fields |
- 3) The DBMS acts as an interface between \_\_\_\_\_ and \_\_\_\_\_ of an enterprise-class system.
  - a) Data and the DBMS
  - b) Application and SQL
  - c) Database application and the database
  - d) The user and the software
- 4) What is the function of the following command? Delete from r where P;
  - a) Clears entries from relation
  - b) Deletes relation
  - c) Deletes particular tuple from relation
  - d) All of the mentioned
- 5) Which of the following is the full form of DDL?
 

|                             |                             |
|-----------------------------|-----------------------------|
| a) Data definition language | b) Data derivation language |
| c) Dynamic data language    | d) Detailed data language   |
- 6) Which of the following is known as minimal super key?
 

|                |                  |
|----------------|------------------|
| a) Primary key | b) Candidate key |
| c) Foreign key | d) None          |
- 7) Which clause is used to retrieve a unique element from the table?
 

|                   |                      |
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| a) SELECT UNIQUE  | b) SELECT DISTINCT   |
| c) Both A) and B) | d) None of the above |

- 8) What is ACID properties of Transactions?
- a) Atomicity, Consistency, Isolation, Database
  - b) Atomicity, Consistency, Isolation, Durability
  - c) Atomicity, Consistency, Inconsistent, Durability
  - d) Automatically, Concurrency. Isolation, Durability
- 9) A table is in 3NF if it is in 2NF and if it has no \_\_\_\_\_.  
a) Functional Dependencies                      b) Transitive Dependencies  
c) Trivial Functional Dependency              d) Multivalued Dependencies
- 10) Redundancy is reduced in a database table by using the \_\_\_\_\_ form.  
a) Abnormal                                          b) Normal  
c) Special                                            d) None
- 11) Which of the following is a type of Normal Form?  
a) ACNF                                              b) BCNF  
c) CCNF                                              d) DCNF
- 12) Some database columns can be used to create \_\_\_\_\_.  
a) Indices                                            b) Files  
c) Indexes                                            d) Records
- 13) Which of the following systems is responsible for ensuring isolation?  
a) Recovery system                                b) Atomic system  
c) Concurrency control system                d) Compiler system
- 14) In order to undo the work of transaction after last commit which one should be used?  
a) View                                                b) Commit  
c) Rollback                                            d) Flashback

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Set **P**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three** **12**
- List four significant features of file processing system.
  - Explain any four relational algebra operations with example.
  - Define the following terms Entity, Attributes, Entity Sets, Cardinality and its types.
  - Discuss various DDL commands in SQL.
- Q.3 Attempt any two.** **16**
- Draw ER diagram for below scenario: A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
  - In SQL, explain the terms with syntax and example. SELECT, DISTINCT, WHERE, ORDERBY
  - List significant differences between a file-processing system and DBMS.

**Section - II**

- Q.4 Attempt any three** **12**
- Define functional dependency and need of normalization.
  - Explain the terms: Transaction, ACID Property
  - Explain the following terms with example; primary indexing and clustering indexing.
  - Discuss timestamp-based protocol.
- Q.5 Attempt any two** **16**
- Discuss types of normalization in detail with example.
  - Explain conflict serializability with example.
  - Consider following schedules involving two transactions:  
 S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)  
 S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
    - If given schedule is conflict serializable convert it into Conflict Serializable schedule.
    - If given schedule is not conflict serializable convert it into View Serializable Schedule.

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What is ACID properties of Transactions?
  - a) Atomicity, Consistency, Isolation, Database
  - b) Atomicity, Consistency, Isolation, Durability
  - c) Atomicity, Consistency, Inconsistent, Durability
  - d) Automatically, Concurrency. Isolation, Durability
- 2) A table is in 3NF if it is in 2NF and if it has no \_\_\_\_\_.
  - a) Functional Dependencies
  - b) Transitive Dependencies
  - c) Trivial Functional Dependency
  - d) Multivalued Dependencies
- 3) Redundancy is reduced in a database table by using the \_\_\_\_\_ form.
  - a) Abnormal
  - b) Normal
  - c) Special
  - d) None
- 4) Which of the following is a type of Normal Form?
  - a) ACNF
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- 5) Some database columns can be used to create \_\_\_\_\_.
  - a) Indices
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  - c) Indexes
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- 6) Which of the following systems is responsible for ensuring isolation?
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- 7) In order to undo the work of transaction after last commit which one should be used?
  - a) View
  - b) Commit
  - c) Rollback
  - d) Flashback
- 8) Which type of data can be stored in the database?
  - a) Image oriented data
  - b) Text, files containing data
  - c) Data in the form of audio or video
  - d) All of the above

- 9) What does an RDBMS consist of?
- a) Collection of Records
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  - c) Collection of Tables
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- 10) The DBMS acts as an interface between \_\_\_\_\_ and \_\_\_\_\_ of an enterprise-class system.
- a) Data and the DBMS
  - b) Application and SQL
  - c) Database application and the database
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- 11) What is the function of the following command? Delete from r where P;
- a) Clears entries from relation
  - b) Deletes relation
  - c) Deletes particular tuple from relation
  - d) All of the mentioned
- 12) Which of the following is the full form of DDL?
- a) Data definition language
  - b) Data derivation language
  - c) Dynamic data language
  - d) Detailed data language
- 13) Which of the following is known as minimal super key?
- a) Primary key
  - b) Candidate key
  - c) Foreign key
  - d) None
- 14) Which clause is used to retrieve a unique element from the table?
- a) SELECT UNIQUE
  - b) SELECT DISTINCT
  - c) Both A) and B)
  - d) None of the above



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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
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**Section – I**

- Q.2 Attempt any three** **12**
- List four significant features of file processing system.
  - Explain any four relational algebra operations with example.
  - Define the following terms Entity, Attributes, Entity Sets, Cardinality and its types.
  - Discuss various DDL commands in SQL.
- Q.3 Attempt any two.** **16**
- Draw ER diagram for below scenario: A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
  - In SQL, explain the terms with syntax and example. SELECT, DISTINCT, WHERE, ORDERBY
  - List significant differences between a file-processing system and DBMS.

**Section - II**

- Q.4 Attempt any three** **12**
- Define functional dependency and need of normalization.
  - Explain the terms: Transaction, ACID Property
  - Explain the following terms with example; primary indexing and clustering indexing.
  - Discuss timestamp-based protocol.
- Q.5 Attempt any two** **16**
- Discuss types of normalization in detail with example.
  - Explain conflict serializability with example.
  - Consider following schedules involving two transactions:  
 S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)  
 S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
    - If given schedule is conflict serializable convert it into Conflict Serializable schedule.
    - If given schedule is not conflict serializable convert it into View Serializable Schedule.

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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is a type of Normal Form?
 

|         |         |
|---------|---------|
| a) ACNF | b) BCNF |
| c) CCNF | d) DCNF |
- 2) Some database columns can be used to create \_\_\_\_\_.
 

|            |            |
|------------|------------|
| a) Indices | b) Files   |
| c) Indexes | d) Records |
- 3) Which of the following systems is responsible for ensuring isolation?
 

|                               |                    |
|-------------------------------|--------------------|
| a) Recovery system            | b) Atomic system   |
| c) Concurrency control system | d) Compiler system |
- 4) In order to undo the work of transaction after last commit which one should be used?
 

|             |              |
|-------------|--------------|
| a) View     | b) Commit    |
| c) Rollback | d) Flashback |
- 5) Which type of data can be stored in the database?
 

|                                       |
|---------------------------------------|
| a) Image oriented data                |
| b) Text, files containing data        |
| c) Data in the form of audio or video |
| d) All of the above                   |
- 6) What does an RDBMS consist of?
 

|                          |                         |
|--------------------------|-------------------------|
| a) Collection of Records | b) Collection of Keys   |
| c) Collection of Tables  | d) Collection of Fields |
- 7) The DBMS acts as an interface between \_\_\_\_\_ and \_\_\_\_\_ of an enterprise-class system.
 

|                                          |
|------------------------------------------|
| a) Data and the DBMS                     |
| b) Application and SQL                   |
| c) Database application and the database |
| d) The user and the software             |

- 8) What is the function of the following command? Delete from r where P;
- a) Clears entries from relation
  - b) Deletes relation
  - c) Deletes particular tuple from relation
  - d) All of the mentioned
- 9) Which of the following is the full form of DDL?
- a) Data definition language
  - b) Data derivation language
  - c) Dynamic data language
  - d) Detailed data language
- 10) Which of the following is known as minimal super key?
- a) Primary key
  - b) Candidate key
  - c) Foreign key
  - d) None
- 11) Which clause is used to retrieve a unique element from the table?
- a) SELECT UNIQUE
  - b) SELECT DISTINCT
  - c) Both A) and B)
  - d) None of the above
- 12) What is ACID properties of Transactions?
- a) Atomicity, Consistency, Isolation, Database
  - b) Atomicity, Consistency, Isolation, Durability
  - c) Atomicity, Consistency, Inconsistent, Durability
  - d) Automatically, Concurrency. Isolation, Durability
- 13) A table is in 3NF if it is in 2NF and if it has no \_\_\_\_.
- a) Functional Dependencies
  - b) Transitive Dependencies
  - c) Trivial Functional Dependency
  - d) Multivalued Dependencies
- 14) Redundancy is reduced in a database table by using the \_\_\_\_ form.
- a) Abnormal
  - b) Normal
  - c) Special
  - d) None

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Set **R**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three** **12**
- List four significant features of file processing system.
  - Explain any four relational algebra operations with example.
  - Define the following terms Entity, Attributes, Entity Sets, Cardinality and its types.
  - Discuss various DDL commands in SQL.
- Q.3 Attempt any two.** **16**
- Draw ER diagram for below scenario: A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
  - In SQL, explain the terms with syntax and example. SELECT, DISTINCT, WHERE, ORDERBY
  - List significant differences between a file-processing system and DBMS.

**Section - II**

- Q.4 Attempt any three** **12**
- Define functional dependency and need of normalization.
  - Explain the terms: Transaction, ACID Property
  - Explain the following terms with example; primary indexing and clustering indexing.
  - Discuss timestamp-based protocol.
- Q.5 Attempt any two** **16**
- Discuss types of normalization in detail with example.
  - Explain conflict serializability with example.
  - Consider following schedules involving two transactions:  
 S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)  
 S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
    - If given schedule is conflict serializable convert it into Conflict Serializable schedule.
    - If given schedule is not conflict serializable convert it into View Serializable Schedule.

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| Set | S |
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**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is known as minimal super key?
  - a) Primary key
  - b) Candidate key
  - c) Foreign key
  - d) None
- 2) Which clause is used to retrieve a unique element from the table?
  - a) SELECT UNIQUE
  - b) SELECT DISTINCT
  - c) Both A) and B)
  - d) None of the above
- 3) What is ACID properties of Transactions?
  - a) Atomicity, Consistency, Isolation, Database
  - b) Atomicity, Consistency, Isolation, Durability
  - c) Atomicity, Consistency, Inconsistent, Durability
  - d) Automatically, Concurrency. Isolation, Durability
- 4) A table is in 3NF if it is in 2NF and if it has no \_\_\_\_\_.
  - a) Functional Dependencies
  - b) Transitive Dependencies
  - c) Trivial Functional Dependency
  - d) Multivalued Dependencies
- 5) Redundancy is reduced in a database table by using the \_\_\_\_\_ form.
  - a) Abnormal
  - b) Normal
  - c) Special
  - d) None
- 6) Which of the following is a type of Normal Form?
  - a) ACNF
  - b) BCNF
  - c) CCNF
  - d) DCNF
- 7) Some database columns can be used to create \_\_\_\_\_.
  - a) Indices
  - b) Files
  - c) Indexes
  - d) Records
- 8) Which of the following systems is responsible for ensuring isolation?
  - a) Recovery system
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  - d) Compiler system
- 9) In order to undo the work of transaction after last commit which one should be used?
  - a) View
  - b) Commit
  - c) Rollback
  - d) Flashback

- 10)** Which type of data can be stored in the database?
- a) Image oriented data
  - b) Text, files containing data
  - c) Data in the form of audio or video
  - d) All of the above
- 11)** What does an RDBMS consist of?
- a) Collection of Records
  - b) Collection of Keys
  - c) Collection of Tables
  - d) Collection of Fields
- 12)** The DBMS acts as an interface between \_\_\_\_\_ and \_\_\_\_\_ of an enterprise-class system.
- a) Data and the DBMS
  - b) Application and SQL
  - c) Database application and the database
  - d) The user and the software
- 13)** What is the function of the following command? Delete from r where P;
- a) Clears entries from relation
  - b) Deletes relation
  - c) Deletes particular tuple from relation
  - d) All of the mentioned
- 14)** Which of the following is the full form of DDL?
- a) Data definition language
  - b) Data derivation language
  - c) Dynamic data language
  - d) Detailed data language

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Set **S**

**S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Database Management Systems**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any three** **12**
- List four significant features of file processing system.
  - Explain any four relational algebra operations with example.
  - Define the following terms Entity, Attributes, Entity Sets, Cardinality and its types.
  - Discuss various DDL commands in SQL.
- Q.3 Attempt any two.** **16**
- Draw ER diagram for below scenario: A salesperson may manage many other salespeople. A salesperson is managed by only one salespeople. A salesperson can be an agent for many customers. A customer is managed by one salespeople. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.
  - In SQL, explain the terms with syntax and example. SELECT, DISTINCT, WHERE, ORDERBY
  - List significant differences between a file-processing system and DBMS.

**Section - II**

- Q.4 Attempt any three** **12**
- Define functional dependency and need of normalization.
  - Explain the terms: Transaction, ACID Property
  - Explain the following terms with example; primary indexing and clustering indexing.
  - Discuss timestamp-based protocol.
- Q.5 Attempt any two** **16**
- Discuss types of normalization in detail with example.
  - Explain conflict serializability with example.
  - Consider following schedules involving two transactions:  
 S1: r1(X); r1(Y); r2(X); r2(Y); w2(Y); w1(X)  
 S2: r1(X); r2(X); r2(Y); w2(Y); r1(Y); w1(X)
    - If given schedule is conflict serializable convert it into Conflict Serializable schedule.
    - If given schedule is not conflict serializable convert it into View Serializable Schedule.

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| Set | P |
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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which terminology deals with the excitation or stimulus applied to the system from an external source for the generation of an output?
  - a) Input signal
  - b) Output signal
  - c) Error signal
  - d) Feedback signal
- 2) For the elimination of feedback loops, the derivation based on transfer function of \_\_\_\_\_ loop is used.
  - a) Open
  - b) Closed
  - c) Both a and b
  - d) None of the above
- 3) Where are the dummy nodes added in the branch with unity gain?
  - a) At input & output nodes
  - b) Between chain nodes
  - c) Both a and b
  - d) None of the above
- 4) Transfer function of the system is defined as the ratio of Laplace output to Laplace input considering initial conditions \_\_\_\_\_.
  - a) 1
  - b) 2
  - c) 0
  - d) infinite
- 5) Loop which do not possess any common node are said to be \_\_\_\_\_ loops.
  - a) Forward gain
  - b) Touching loops
  - c) Non touching loops
  - d) Feedback gain
- 6) The type 2 system has at the origin \_\_\_\_\_.
  - a) no net pole
  - b) net pole
  - c) simple pole
  - d) two poles
- 7) In case of type-1 system steady state acceleration is \_\_\_\_\_.
  - a) unity
  - b) infinity
  - c) zero
  - d) 10
- 8) If the system is specified by open loop transfer function  $G(s)H(s) = k / s(s + 3)(s + 2)$ , how many root loci proceed to end at infinity?
  - a) 2
  - b) 3
  - c) 5
  - d) 6



- 9) Which point on root locus specifies the meeting or collision of two poles?
  - a) Centroid
  - b) Break away point
  - c) Stability point
  - d) Anti-break point
- 10) Which unit is adopted for magnitude measurement in Bode plots?
  - a) Degree
  - b) Decimal
  - c) Decibel
  - d) Deviation
- 11) In an octave frequency band, the ratio of  $f_2 / f_1$  is equivalent to \_\_\_\_\_.
  - a) 2
  - b) 4
  - c) 8
  - d) 10
- 12) State space analysis is applicable even if the initial conditions are \_\_\_\_\_.
  - a) Zero
  - b) Non-zero
  - c) Equal
  - d) Not equal
- 13) The analysis of multiple input multiple output is conveniently studied by;
  - a) State space analysis
  - b) Root locus approach
  - c) Characteristic equation approach
  - d) Nicholas chart
- 14) Which of the following is exhibited by root locus diagrams?
  - a) The bandwidth of the system
  - b) The response of a system to a step input
  - c) The frequency response of a system
  - d) The poles of the transfer function for a set of parameter values

Seat  
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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.**

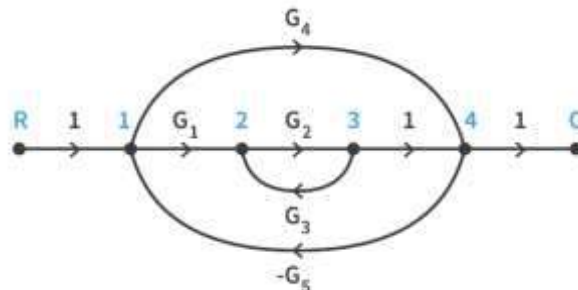
16

- 1) Explain missile launching and guidance system.
- 2) Explain block diagram reduction rules.
- 3) Write a note on Stepper Motor.
- 4) Find the transfer function of series RLC circuit.
- 5) Explain standard test signals.

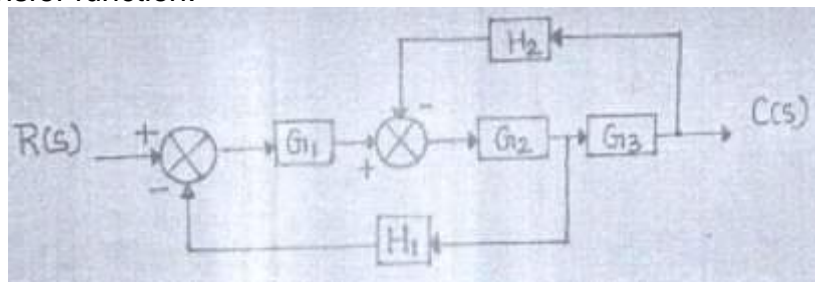
**Q.3 Attempt any two:**

12

- 1) Find transfer function for given SFG diagram.



- 2) Find transfer function.



- 3) A system is given by  $C(S)/R(S) = 1/S^2 + S + 1$ . Find time response specifications.

## Section – II

**Q.4 Attempt any Four.****16**

- 1) State the advantages and limitations of Routh's criteria.
- 2) Investigate the stability of the system with characteristics equation  
 $Q(S) = S^3 + 7S^2 + 10S + k = 0$  Find  $K_{mar}$  and  $\omega_{mar}$
- 3) Compare the absolute and conditional stability.
- 4) Write a short on co-relation between time domain and frequency domain for second order system.
- 5) Explain the concept of controllability and observability.

**Q.5 Attempt any two:****12**

- 1) Explain in a detail steps involved in Bode plot with suitable example.
- 2) Determine damping factor, under damped natural frequency, resonant peak & resonant frequency for the system with closed loop transfer function.

$$G(S) = \frac{100}{S^2 + 10S + 100}$$

- 3) Give advantages and disadvantages of state space analysis approach.

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| Set | Q |
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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.  
 4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If the system is specified by open loop transfer function  $G(s)H(s) = k / s(s + 3)(s + 2)$ , how many root loci proceed to end at infinity?
 

|      |      |
|------|------|
| a) 2 | b) 3 |
| c) 5 | d) 6 |
- 2) Which point on root locus specifies the meeting or collision of two poles?
 

|                    |                     |
|--------------------|---------------------|
| a) Centroid        | b) Break away point |
| c) Stability point | d) Anti-break point |
- 3) Which unit is adopted for magnitude measurement in Bode plots?
 

|            |              |
|------------|--------------|
| a) Degree  | b) Decimal   |
| c) Decibel | d) Deviation |
- 4) In an octave frequency band, the ratio of  $f_2 / f_1$  is equivalent to \_\_\_\_\_.
 

|      |       |
|------|-------|
| a) 2 | b) 4  |
| c) 8 | d) 10 |
- 5) State space analysis is applicable even if the initial conditions are \_\_\_\_\_.
 

|          |              |
|----------|--------------|
| a) Zero  | b) Non-zero  |
| c) Equal | d) Not equal |
- 6) The analysis of multiple input multiple output is conveniently studied by;
 

|                                     |                        |
|-------------------------------------|------------------------|
| a) State space analysis             | b) Root locus approach |
| c) Characteristic equation approach | d) Nicholas chart      |
- 7) Which of the following is exhibited by root locus diagrams?
 

|                                                                     |
|---------------------------------------------------------------------|
| a) The bandwidth of the system                                      |
| b) The response of a system to a step input                         |
| c) The frequency response of a system                               |
| d) The poles of the transfer function for a set of parameter values |
- 8) Which terminology deals with the excitation or stimulus applied to the system from an external source for the generation of an output?
 

|                 |                    |
|-----------------|--------------------|
| a) Input signal | b) Output signal   |
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- 9) For the elimination of feedback loops, the derivation based on transfer function of \_\_\_\_\_ loop is used.
- a) Open
  - b) Closed
  - c) Both a and b
  - d) None of the above
- 10) Where are the dummy nodes added in the branch with unity gain?
- a) At input & output nodes
  - b) Between chain nodes
  - c) Both a and b
  - d) None of the above
- 11) Transfer function of the system is defined as the ratio of Laplace output to Laplace input considering initial conditions \_\_\_\_\_.
- a) 1
  - b) 2
  - c) 0
  - d) infinite
- 12) Loop which do not possess any common node are said to be \_\_\_\_\_ loops.
- a) Forward gain
  - b) Touching loops
  - c) Non touching loops
  - d) Feedback gain
- 13) The type 2 system has at the origin \_\_\_\_\_.
- a) no net pole
  - b) net pole
  - c) simple pole
  - d) two poles
- 14) In case of type-1 system steady state acceleration is \_\_\_\_\_.
- a) unity
  - b) infinity
  - c) zero
  - d) 10

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| Seat No. |  |
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Set **Q**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.**

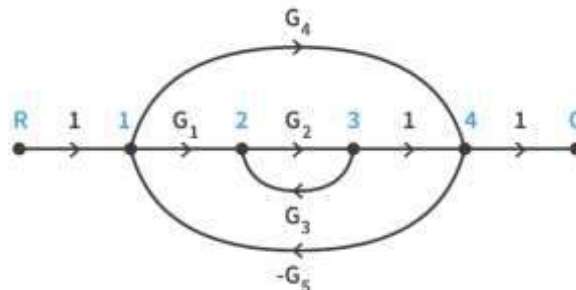
16

- 1) Explain missile launching and guidance system.
- 2) Explain block diagram reduction rules.
- 3) Write a note on Stepper Motor.
- 4) Find the transfer function of series RLC circuit.
- 5) Explain standard test signals.

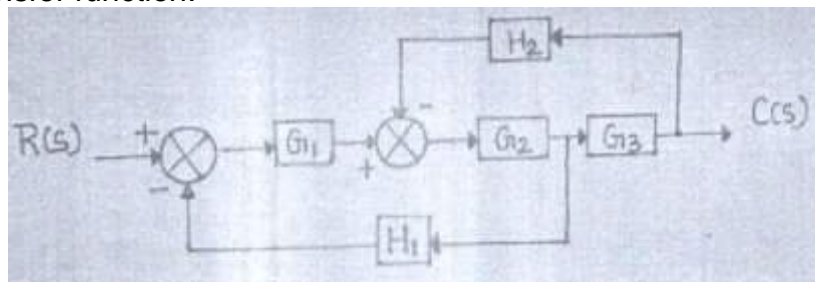
**Q.3 Attempt any two:**

12

- 1) Find transfer function for given SFG diagram.



- 2) Find transfer function.



- 3) A system is given by  $C(S)/R(S) = 1/S^2 + S + 1$ . Find time response specifications.

## Section – II

**Q.4 Attempt any Four.****16**

- 1) State the advantages and limitations of Routh's criteria.
- 2) Investigate the stability of the system with characteristics equation  
 $Q(S) = S^3 + 7S^2 + 10S + k = 0$  Find  $K_{mar}$  and  $\omega_{mar}$
- 3) Compare the absolute and conditional stability.
- 4) Write a short on co-relation between time domain and frequency domain for second order system.
- 5) Explain the concept of controllability and observability.

**Q.5 Attempt any two:****12**

- 1) Explain in a detail steps involved in Bode plot with suitable example.
- 2) Determine damping factor, under damped natural frequency, resonant peak & resonant frequency for the system with closed loop transfer function.

$$G(S) = \frac{100}{S^2 + 10S + 100}$$

- 3) Give advantages and disadvantages of state space analysis approach.

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- 9)** Loop which do not possess any common node are said to be \_\_\_\_\_ loops.

|                       |                   |
|-----------------------|-------------------|
| a) Forward gain       | b) Touching loops |
| c) Non touching loops | d) Feedback gain  |
- 10)** The type 2 system has at the origin \_\_\_\_\_.

|                |              |
|----------------|--------------|
| a) no net pole | b) net pole  |
| c) simple pole | d) two poles |
- 11)** In case of type-1 system steady state acceleration is \_\_\_\_\_.

|          |             |
|----------|-------------|
| a) unity | b) infinity |
| c) zero  | d) 10       |
- 12)** If the system is specified by open loop transfer function  
 $G(s) H(s) = k / s(s + 3)(s + 2)$ , how many root loci proceed to end at infinity?

|      |      |
|------|------|
| a) 2 | b) 3 |
| c) 5 | d) 6 |
- 13)** Which point on root locus specifies the meeting or collision of two poles?

|                    |                     |
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| a) Centroid        | b) Break away point |
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- 14)** Which unit is adopted for magnitude measurement in Bode plots?

|            |              |
|------------|--------------|
| a) Degree  | b) Decimal   |
| c) Decibel | d) Deviation |

Seat  
No.

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.**

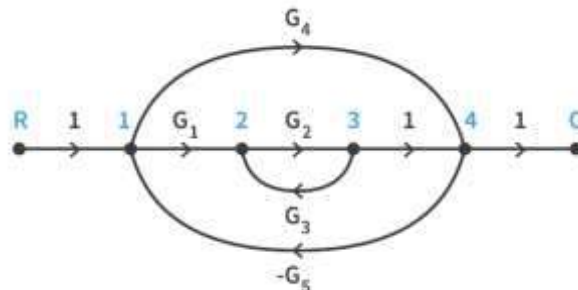
**16**

- 1) Explain missile launching and guidance system.
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- 4) Find the transfer function of series RLC circuit.
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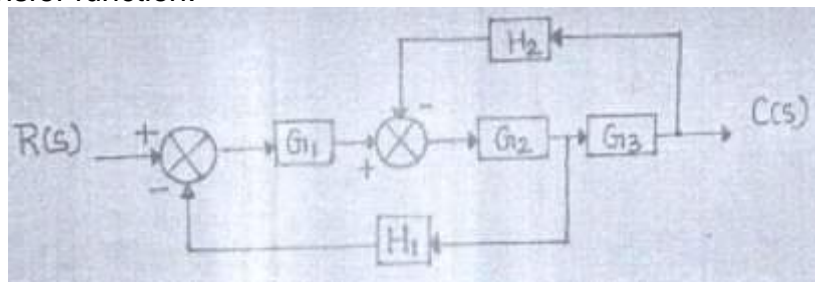
**Q.3 Attempt any two:**

**12**

- 1) Find transfer function for given SFG diagram.



- 2) Find transfer function.



- 3) A system is given by  $C(S)/R(S) = 1/S^2 + S + 1$ . Find time response specifications.

## Section – II

**Q.4 Attempt any Four.****16**

- 1) State the advantages and limitations of Routh's criteria.
- 2) Investigate the stability of the system with characteristics equation  
 $Q(S) = S^3 + 7S^2 + 10S + k = 0$  Find  $K_{mar}$  and  $\omega_{mar}$
- 3) Compare the absolute and conditional stability.
- 4) Write a short on co-relation between time domain and frequency domain for second order system.
- 5) Explain the concept of controllability and observability.

**Q.5 Attempt any two:****12**

- 1) Explain in a detail steps involved in Bode plot with suitable example.
- 2) Determine damping factor, under damped natural frequency, resonant peak & resonant frequency for the system with closed loop transfer function.

$$G(S) = \frac{100}{S^2 + 10S + 100}$$

- 3) Give advantages and disadvantages of state space analysis approach.

**Seat  
No.**

| Set | S |
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Day & Date: Monday, 06-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data if necessary.

Marks: 14

14

- Page 13 of 16

- 9) Which of the following is exhibited by root locus diagrams?
- a) The bandwidth of the system
  - b) The response of a system to a step input
  - c) The frequency response of a system
  - d) The poles of the transfer function for a set of parameter values
- 10) Which terminology deals with the excitation or stimulus applied to the system from an external source for the generation of an output?
- a) Input signal
  - b) Output signal
  - c) Error signal
  - d) Feedback signal
- 11) For the elimination of feedback loops, the derivation based on transfer function of \_\_\_\_\_ loop is used.
- a) Open
  - b) Closed
  - c) Both a and b
  - d) None of the above
- 12) Where are the dummy nodes added in the branch with unity gain?
- a) At input & output nodes
  - b) Between chain nodes
  - c) Both a and b
  - d) None of the above
- 13) Transfer function of the system is defined as the ratio of Laplace output to Laplace input considering initial conditions \_\_\_\_\_.
- a) 1
  - b) 2
  - c) 0
  - d) infinite
- 14) Loop which do not possess any common node are said to be \_\_\_\_\_ loops.
- a) Forward gain
  - b) Touching loops
  - c) Non touching loops
  - d) Feedback gain

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Set **S**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Control Systems**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any Four.**

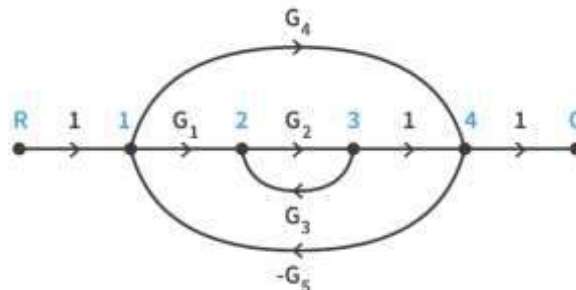
16

- 1) Explain missile launching and guidance system.
- 2) Explain block diagram reduction rules.
- 3) Write a note on Stepper Motor.
- 4) Find the transfer function of series RLC circuit.
- 5) Explain standard test signals.

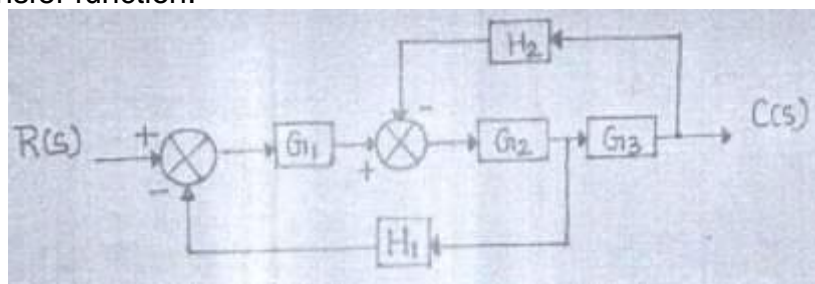
**Q.3 Attempt any two:**

12

- 1) Find transfer function for given SFG diagram.



- 2) Find transfer function.



- 3) A system is given by  $C(S)/R(S) = 1/S^2 + S + 1$ . Find time response specifications.

## Section – II

**Q.4 Attempt any Four.****16**

- 1) State the advantages and limitations of Routh's criteria.
- 2) Investigate the stability of the system with characteristics equation  
 $Q(S) = S^3 + 7S^2 + 10S + k = 0$  Find  $K_{mar}$  and  $\omega_{mar}$
- 3) Compare the absolute and conditional stability.
- 4) Write a short on co-relation between time domain and frequency domain for second order system.
- 5) Explain the concept of controllability and observability.

**Q.5 Attempt any two:****12**

- 1) Explain in a detail steps involved in Bode plot with suitable example.
- 2) Determine damping factor, under damped natural frequency, resonant peak & resonant frequency for the system with closed loop transfer function.

$$G(S) = \frac{100}{S^2 + 10S + 100}$$

- 3) Give advantages and disadvantages of state space analysis approach.

**Seat  
No.**

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14





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Set

P

**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever necessary.  
 3) Draw neat diagram wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- Derive equations for  $I_{CQ}$  &  $V_{CEQ}$  of Dual input balanced output differential amplifier using transistors.
- Derive equation for ideal voltage gain of Inverting amplifier using virtual ground concept.
- Define any four electrical parameters of IC 741 with practical & ideal values.
- Explain basic integrator with i/p & o/p waveforms.
- For Inverting amplifier with feedback using IC 741,  $R_1 = 470\Omega$  &  $R_F = 4.7K\Omega$   
 Calculate the values for  $A_F$ ,  $R_{iF}$ ,  $R_{oF}$  &  $f_F$   
 (For IC 741 Assume  $A = 200000$ ,  $R_i = 2M\Omega$ ,  $R_o = 75\Omega$  &  $f_o = 5\text{ Hz}$ )

**Q.3 Attempt any two.** **12**

- Derive expressions for gain  $A_d$  for DIBO differential amplifier using AC equivalent circuit.
- Explain instrumentation amplifier with transducer bridge & derive expression of output voltage.
- Draw high frequency equivalent circuit of op-amp & obtain expression for  $A_{OL}(f)$  open loop gain as function of frequency.

**Section - II**

**Q.4 Answer any four questions.** **16**

- Explain with neat diagram operation of window detector using op-amp.
- Draw & Explain op-amp precision full wave rectifier with i/p & o/p waveforms.
- Design RC phase shift oscillator using op-amp 741 for output frequency of 200 Hz. (Assume  $C = 0.1\mu F$ )
- Explain op-amp square wave generator with circuit diagram & waveforms.
- Explain mono stable multi vibrator using IC 555 with equation for output.

**Q.5 Answer any two questions.** **12**

- Explain op-amp triangular wave generator with circuit diagram & waveforms.
- Design & explain first order low pass filter at cutoff frequency of 1 KHz with a pass band gain of 2.
- Calculate  $V_{ut}$ ,  $V_{lt}$ , hysteresis voltage & draw o/p waveform for op-amp Schmitt trigger circuit With  $V_{in} = 1\text{ Vp-p}$  sine wave signal,  $\pm V_{cc} = 15\text{ Volt}$ ,  $R_1 = 100\Omega$ ,  $R_2 = 56k\Omega$  & IC 741.



- 10) The type of feedback used in closed loop inverting amplifier is \_\_\_\_\_.
  - a) Voltage series
  - b) Current series
  - c) Current shunt
  - d) Voltage shunt
- 11)  $\pm V_{sat}/(1 + AB)$  is total output offset voltage for \_\_\_\_\_.
  - a) Inverting amplifier
  - b) Non-Inverting amplifier
  - c) Both b & a
  - d) None of these
- 12) I to V converter is special case of \_\_\_\_\_ amplifier.
  - a) Non-inverting
  - b) Inverting
  - c) Differential
  - d) Scaling
- 13) For IC 741 maximum Input bias current at supply voltage  $\pm 15$  volts dc is \_\_\_\_\_.
  - a) 75 nA
  - b) 100 nA
  - c) 750 nA
  - d) 500 nA
- 14) A DC inserter is \_\_\_\_\_.
  - a) Clipper
  - b) Peak detector
  - c) Clamper
  - d) Integrator

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever necessary.  
 3) Draw neat diagram wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- Derive equations for  $I_{CQ}$  &  $V_{CEQ}$  of Dual input balanced output differential amplifier using transistors.
- Derive equation for ideal voltage gain of Inverting amplifier using virtual ground concept.
- Define any four electrical parameters of IC 741 with practical & ideal values.
- Explain basic integrator with i/p & o/p waveforms.
- For Inverting amplifier with feedback using IC 741,  $R_1 = 470\Omega$  &  $R_F = 4.7K\Omega$   
 Calculate the values for  $A_F$ ,  $R_{iF}$ ,  $R_{oF}$  &  $f_F$   
 (For IC 741 Assume  $A = 200000$ ,  $R_i = 2M\Omega$ ,  $R_o = 75\Omega$  &  $f_o = 5\text{ Hz}$ )

**Q.3 Attempt any two.** **12**

- Derive expressions for gain  $A_d$  for DIBO differential amplifier using AC equivalent circuit.
- Explain instrumentation amplifier with transducer bridge & derive expression of output voltage.
- Draw high frequency equivalent circuit of op-amp & obtain expression for  $A_{OL}(f)$  open loop gain as function of frequency.

**Section - II**

**Q.4 Answer any four questions.** **16**

- Explain with neat diagram operation of window detector using op-amp.
- Draw & Explain op-amp precision full wave rectifier with i/p & o/p waveforms.
- Design RC phase shift oscillator using op-amp 741 for output frequency of 200 Hz. (Assume  $C = 0.1\mu F$ )
- Explain op-amp square wave generator with circuit diagram & waveforms.
- Explain mono stable multi vibrator using IC 555 with equation for output.

**Q.5 Answer any two questions.** **12**

- Explain op-amp triangular wave generator with circuit diagram & waveforms.
- Design & explain first order low pass filter at cutoff frequency of 1 KHz with a pass band gain of 2.
- Calculate  $V_{ut}$ ,  $V_{lt}$ , hysteresis voltage & draw o/p waveform for op-amp Schmitt trigger circuit With  $V_{in} = 1\text{ Vp-p}$  sine wave signal,  $\pm V_{cc} = 15\text{ Volt}$ ,  $R_1 = 100\Omega$ ,  $R_2 = 56k\Omega$  & IC 741.

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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) V<sub>ref</sub> for LM317 is \_\_\_\_\_.  
a) 1.25mV  
b) 1.25V  
c) 12.5V  
d) None of these
- 2) Butterworth filter is also called as \_\_\_\_\_.  
a) Riple-riple  
b) Riple-Flat  
c) Flat-ripple  
d) Flat-Flat
- 3) For second order active filter gain roll off rate in stop band is \_\_\_\_\_.  
a) 40 dB/decade  
b) 20 dB/decade  
c) 90 dB/decade  
d) 60 dB/decade
- 4) If square wave input is applied to a differentiator, then output will be \_\_\_\_\_.  
a) Inverted square wave  
b) Cosine wave  
c) Sine wave  
d) Spike wave
- 5) Differential voltage gain of DIBO differential amplifier is \_\_\_\_\_.  
a)  $R_c/2r_e$   
b)  $2R_c/r_e$   
c)  $R_c/r_e$   
d)  $2\beta ac r_e$
- 6) What should be maximum bandwidth for a gain of 10 in case of IC 741?  
a) 1 MHz  
b) 100KHz  
c) 10 KHz  
d) 1KHz
- 7) The type of feedback used in closed loop inverting amplifier is \_\_\_\_\_.  
a) Voltage series  
b) Current series  
c) Current shunt  
d) Voltage shunt
- 8)  $\pm V_{sat}/(1 + AB)$  is total output offset voltage for \_\_\_\_\_.  
a) Inverting amplifier  
b) Non-Inverting amplifier  
c) Both b & a  
d) None of these
- 9) I to V converter is special case of \_\_\_\_\_ amplifier.  
a) Non-inverting  
b) Inverting  
c) Differential  
d) Scaling

- 10) For IC 741 maximum Input bias current at supply voltage  $\pm 15$  volts dc is \_\_\_\_\_.
  - a) 75 nA
  - b) 100 nA
  - c) 750 nA
  - d) 500 nA
- 11) A DC inserter is \_\_\_\_\_.
  - a) Clipper
  - b) Peak detector
  - c) Clamper
  - d) Integrator
- 12) For audio frequency oscillator components used are \_\_\_\_\_.
  - a) Crystal
  - b) LC
  - c) RC
  - d) LRC
- 13) A duty cycle is less than \_\_\_\_\_ in saw tooth wave generator.
  - a) 90%
  - b) 66.66%
  - c) 50%
  - d) 20%
- 14) The voltage at threshold pin of IC 555 is \_\_\_\_\_.
  - a)  $V_{cc}/3$
  - b)  $2V_{cc}/3$
  - c)  $V_{cc}$
  - d) All of these

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever necessary.  
 3) Draw neat diagram wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- Derive equations for  $I_{CQ}$  &  $V_{CEQ}$  of Dual input balanced output differential amplifier using transistors.
- Derive equation for ideal voltage gain of Inverting amplifier using virtual ground concept.
- Define any four electrical parameters of IC 741 with practical & ideal values.
- Explain basic integrator with i/p & o/p waveforms.
- For Inverting amplifier with feedback using IC 741,  $R_1 = 470\Omega$  &  $R_F = 4.7K\Omega$   
 Calculate the values for  $A_F$ ,  $R_{iF}$ ,  $R_{oF}$  &  $f_F$   
 (For IC 741 Assume  $A = 200000$ ,  $R_i = 2M\Omega$ ,  $R_o = 75\Omega$  &  $f_o = 5\text{ Hz}$ )

**Q.3 Attempt any two.** **12**

- Derive expressions for gain  $A_d$  for DIBO differential amplifier using AC equivalent circuit.
- Explain instrumentation amplifier with transducer bridge & derive expression of output voltage.
- Draw high frequency equivalent circuit of op-amp & obtain expression for  $A_{OL}(f)$  open loop gain as function of frequency.

**Section - II**

**Q.4 Answer any four questions.** **16**

- Explain with neat diagram operation of window detector using op-amp.
- Draw & Explain op-amp precision full wave rectifier with i/p & o/p waveforms.
- Design RC phase shift oscillator using op-amp 741 for output frequency of 200 Hz. (Assume  $C = 0.1\mu F$ )
- Explain op-amp square wave generator with circuit diagram & waveforms.
- Explain mono stable multi vibrator using IC 555 with equation for output.

**Q.5 Answer any two questions.** **12**

- Explain op-amp triangular wave generator with circuit diagram & waveforms.
- Design & explain first order low pass filter at cutoff frequency of 1 KHz with a pass band gain of 2.
- Calculate  $V_{ut}$ ,  $V_{lt}$ , hysteresis voltage & draw o/p waveform for op-amp Schmitt trigger circuit With  $V_{in} = 1\text{ Vp-p}$  sine wave signal,  $\pm V_{cc} = 15\text{ Volt}$ ,  $R_1 = 100\Omega$ ,  $R_2 = 56k\Omega$  & IC 741.



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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) For IC 741 maximum Input bias current at supply voltage  $\pm 15$  volts dc is \_\_\_\_\_.  
a) 75 nA                                      b) 100 nA  
c) 750 nA                                     d) 500 nA
- 2) A DC inserter is \_\_\_\_\_.  
a) Clipper                                      b) Peak detector  
c) Clamper                                     d) Integrator
- 3) For audio frequency oscillator components used are \_\_\_\_\_.  
a) Crystal                                      b) LC  
c) RC                                            d) LRC
- 4) A duty cycle is less than \_\_\_\_\_ in saw tooth wave generator.  
a) 90%                                          b) 66.66%  
c) 50%                                          d) 20%
- 5) The voltage at threshold pin of IC 555 is \_\_\_\_\_.  
a)  $V_{cc}/3$                                         b)  $2V_{cc}/3$   
c)  $V_{cc}$                                            d) All of these
- 6)  $V_{ref}$  for LM317 is \_\_\_\_\_.  
a) 1.25mV                                       b) 1.25V  
c) 12.5V                                        d) None of these
- 7) Butterworth filter is also called as \_\_\_\_\_.  
a) Riple-riple                                b) Riple-Flat  
c) Flat-ripple                                 d) Flat-Flat
- 8) For second order active filter gain roll off rate in stop band is \_\_\_\_\_.  
a) 40 dB/decade                              b) 20 dB/decade  
c) 90 dB/decade                              d) 60 dB/decade
- 9) If square wave input is applied to a differentiator, then output will be \_\_\_\_\_.  
a) Inverted square wave                    b) Cosine wave  
c) Sine wave                                   d) Spike wave

- 10)** Differential voltage gain of DIBO differential amplifier is \_\_\_\_\_.  
a)  $R_c/2r_e$                                       b)  $2R_c/r_e$   
c)  $R_c/r_e$                                         d)  $2\beta_{ac} r_e$
- 11)** What should be maximum bandwidth for a gain of 10 in case of IC 741?  
a) 1 MHz                                          b) 100KHz  
c) 10 KHz                                         d) 1KHz
- 12)** The type of feedback used in closed loop inverting amplifier is \_\_\_\_\_.  
a) Voltage series                                b) Current series  
c) Current shunt                                 d) Voltage shunt
- 13)**  $\pm V_{sat}/(1 + AB)$  is total output offset voltage for \_\_\_\_\_.  
a) Inverting amplifier                          b) Non-Inverting amplifier  
c) Both b & a                                      d) None of these
- 14)** I to V converter is special case of \_\_\_\_\_ amplifier.  
a) Non-inverting                                 b) Inverting  
c) Differential                                      d) Scaling

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Analog Integrated Circuits**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All question are compulsory.  
 2) Assume suitable data wherever necessary.  
 3) Draw neat diagram wherever necessary.

**Section – I**

**Q.2 Attempt any four.** **16**

- Derive equations for  $I_{CQ}$  &  $V_{CEQ}$  of Dual input balanced output differential amplifier using transistors.
- Derive equation for ideal voltage gain of Inverting amplifier using virtual ground concept.
- Define any four electrical parameters of IC 741 with practical & ideal values.
- Explain basic integrator with i/p & o/p waveforms.
- For Inverting amplifier with feedback using IC 741,  $R_1 = 470\Omega$  &  $R_F = 4.7K\Omega$   
 Calculate the values for  $A_F$ ,  $R_iF$ ,  $R_oF$  &  $f_F$   
 (For IC 741 Assume  $A = 200000$ ,  $R_i = 2M\Omega$ ,  $R_o = 75\Omega$  &  $f_o = 5\text{ Hz}$ )

**Q.3 Attempt any two.** **12**

- Derive expressions for gain  $A_d$  for DIBO differential amplifier using AC equivalent circuit.
- Explain instrumentation amplifier with transducer bridge & derive expression of output voltage.
- Draw high frequency equivalent circuit of op-amp & obtain expression for  $A_{OL}(f)$  open loop gain as function of frequency.

**Section - II**

**Q.4 Answer any four questions.** **16**

- Explain with neat diagram operation of window detector using op-amp.
- Draw & Explain op-amp precision full wave rectifier with i/p & o/p waveforms.
- Design RC phase shift oscillator using op-amp 741 for output frequency of 200 Hz. (Assume  $C = 0.1\mu F$ )
- Explain op-amp square wave generator with circuit diagram & waveforms.
- Explain mono stable multi vibrator using IC 555 with equation for output.

**Q.5 Answer any two questions.** **12**

- Explain op-amp triangular wave generator with circuit diagram & waveforms.
- Design & explain first order low pass filter at cutoff frequency of 1 KHz with a pass band gain of 2.
- Calculate  $V_{ut}$ ,  $V_{lt}$ , hysteresis voltage & draw o/p waveform for op-amp Schmitt trigger circuit With  $V_{in} = 1\text{ Vp-p}$  sine wave signal,  $\pm V_{cc} = 15\text{ Volt}$ ,  $R_1 = 100\Omega$ ,  $R_2 = 56k\Omega$  & IC 741.

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Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

Duration: 30 Minutes

**Q.1 Choose the correct alternatives from the options.**

- 1) Entropy is the measure of \_\_\_\_\_.  
a) Randomness  
b) Information  
c) Randomness & Information  
d) None of the mentioned
- 2) When the base of the logarithm is e, the unit of measure of information is \_\_\_\_\_.  
a) Bits  
b) Bytes  
c) Nats  
d) None of the mentioned
- 3) When X and Y are statistically independent, then  $I(x,y)$  is \_\_\_\_\_.  
a) 1  
b) 0  
c)  $\ln 2$   
d) Cannot be determined
- 4) Analog information is converted to digital data using \_\_\_\_\_.  
a) Sampling  
b) Quantization  
c) Coding  
d) All of the mentioned
- 5) PCM includes the process of \_\_\_\_\_.  
a) Amplitude discretization  
b) Time discretization  
c) Amplitude & Time discretization  
d) None of the mentioned
- 6) Which of the following gives maximum probability of error?  
a) ASK  
b) FSK  
c) PSK  
d) DPSK
- 7) For non coherent reception of PSK \_\_\_\_\_ is used.  
a) Differential encoding  
b) Decoding  
c) Differential encoding & Decoding  
d) None of the mentioned
- 8) If carrier modulated by a digital bit stream had one of the possible phases 0, 90, 180 & 270, then modulation is called  
a) BPSK  
b) QPSK  
c) QAM  
d) MSK



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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

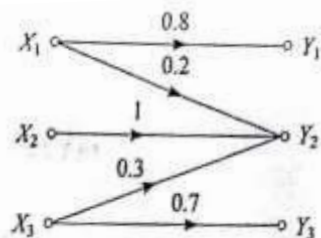
- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.**

**16**

- a) 1) Define Entropy.  
 2) Calculate the joint probability matrix and  $P(Y)$  for a given channel below with the probability of messages  $x_1$ ,  $x_2$ , and  $x_3$  as 0.3, 0.4, and 0.5.



- b) With the help of a block diagram explain the PCM system.  
 c) Illustrate with an example what is uniform quantization.  
 d) Compare ASK, FSK, PSK and DPSK.  
 e) What are different line coding techniques. State its advantages and disadvantages.

**Q.3 Attempt any two.**

**12**

- a) Apply the Shannon-Fano coding procedure for the following message ensemble for  $M=2$ .

$$[X] = [x_1 \ x_2 \ x_3 \ x_4 \ x_5 \ x_6 \ x_7 \ x_8]$$

$$[P] = [1/4 \ 1/8 \ 1/16 \ 1/16 \ 1/16 \ 1/4 \ 1/16 \ 1/8]$$

- b) With the help of a block diagram and waveform, explain the working of the Delta Modulation transmitter. What are the drawbacks of the DM technique?  
 c) With an example explain the working of the DPSK transmitter and receiver.

**Section - II**

**Q.4 Answer any four questions.**

**16**

- a) Explain QPSK transmitter in detail.  
 b) Explain M-ary wideband FSK demodulation.  
 c) Describe Costas Loop method of carrier recovery system.  
 d) What is significance of multicarrier system?

- e) For a (6, 3) code, the parity check matrix is as shown. Determine whether a received code vector is erroneous. The received code vector is 100101.

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

**Q.5 Answer any two questions.**

**12**

- a) Explain how to minimize peak to average power ratio in a multicarrier system.
- b) What are different symbol synchronization methods? Explain DTTL method in detail.
- c) Write a note on QAM transmitter and receiver.

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) If carrier modulated by a digital bit stream had one of the possible phases 0, 90, 180 & 270, then modulation is called
  - a) BPSK
  - b) QPSK
  - c) QAM
  - d) MSK
- 2) The error performance of MPSK \_\_\_\_\_ as M increases.
  - a) Increases
  - b) Decreases
  - c) Stays constant
  - d) None of the mentioned
- 3) In phase lock which parameter is synchronized \_\_\_\_\_.
  - a) Frequency
  - b) Phase
  - c) Frequency & Phase
  - d) None of the mentioned
- 4) A correlation receiver consists of \_\_\_\_\_.
  - a) a multiplier & integrator
  - b) an integrator only
  - c) multiplier only
  - d) adder & integrator
- 5) A major problem of multicarrier modulation is \_\_\_\_\_.
  - a) Fading
  - b) Diversity
  - c) High peak-to-average power ratio
  - d) None of these
- 6) The received code contains an error if the syndrome vector is \_\_\_\_\_.
  - a) Zero
  - b) Non zero
  - c) Infinity
  - d) None of the mentioned
- 7) Block length is the \_\_\_\_\_ in the code word.
  - a) Number of elements
  - b) Distance between elements
  - c) Number of parity bits
  - d) None of the mentioned
- 8) Entropy is the measure of \_\_\_\_\_.
  - a) Randomness
  - b) Information
  - c) Randomness & Information
  - d) None of the mentioned



- 9) When the base of the logarithm is e, the unit of measure of information is \_\_\_\_\_.
  - a) Bits
  - b) Bytes
  - c) Nats
  - d) None of the mentioned
- 10) When X and Y are statistically independent, then  $I(x,y)$  is \_\_\_\_\_.
  - a) 1
  - b) 0
  - c)  $\ln 2$
  - d) Cannot be determined
- 11) Analog information is converted to digital data using \_\_\_\_\_.
  - a) Sampling
  - b) Quantization
  - c) Coding
  - d) All of the mentioned
- 12) PCM includes the process of \_\_\_\_\_.
  - a) Amplitude discretization
  - b) Time discretization
  - c) Amplitude & Time discretization
  - d) None of the mentioned
- 13) Which of the following gives maximum probability of error?
  - a) ASK
  - b) FSK
  - c) PSK
  - d) DPSK
- 14) For non coherent reception of PSK \_\_\_\_\_ is used.
  - a) Differential encoding
  - b) Decoding
  - c) Differential encoding & Decoding
  - d) None of the mentioned

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Set **Q**

**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

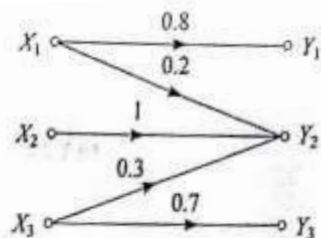
- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.**

16

- a) 1) Define Entropy.  
 2) Calculate the joint probability matrix and  $P(Y)$  for a given channel below with the probability of messages  $x_1$ ,  $x_2$ , and  $x_3$  as 0.3, 0.4, and 0.5.



- b) With the help of a block diagram explain the PCM system.  
 c) Illustrate with an example what is uniform quantization.  
 d) Compare ASK, FSK, PSK and DPSK.  
 e) What are different line coding techniques. State its advantages and disadvantages.

**Q.3 Attempt any two.**

12

- a) Apply the Shannon-Fano coding procedure for the following message ensemble for  $M=2$ .

$$[X] = [x_1 \ x_2 \ x_3 \ x_4 \ x_5 \ x_6 \ x_7 \ x_8]$$

$$[P] = [1/4 \ 1/8 \ 1/16 \ 1/16 \ 1/16 \ 1/4 \ 1/16 \ 1/8]$$

- b) With the help of a block diagram and waveform, explain the working of the Delta Modulation transmitter. What are the drawbacks of the DM technique?  
 c) With an example explain the working of the DPSK transmitter and receiver.

**Section - II**

**Q.4 Answer any four questions.**

16

- a) Explain QPSK transmitter in detail.  
 b) Explain M-ary wideband FSK demodulation.  
 c) Describe Costas Loop method of carrier recovery system.  
 d) What is significance of multicarrier system?

- e) For a (6, 3) code, the parity check matrix is as shown. Determine whether a received code vector is erroneous. The received code vector is 100101.

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

**Q.5 Answer any two questions.**

**12**

- a) Explain how to minimize peak to average power ratio in a multicarrier system.
- b) What are different symbol synchronization methods? Explain DTTL method in detail.
- c) Write a note on QAM transmitter and receiver.

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A correlation receiver consists of \_\_\_\_\_.  
 a) a multiplier & integrator                      b) an integrator only  
 c) multiplier only                                      d) adder & integrator
  
- 2) A major problem of multicarrier modulation is \_\_\_\_\_.  
 a) Fading  
 b) Diversity  
 c) High peak-to-average power ratio  
 d) None of these
  
- 3) The received code contains an error if the syndrome vector is \_\_\_\_\_.  
 a) Zero                                                      b) Non zero  
 c) Infinity                                                d) None of the mentioned
  
- 4) Block length is the \_\_\_\_\_ in the code word.  
 a) Number of elements                              b) Distance between elements  
 c) Number of parity bits                            d) None of the mentioned
  
- 5) Entropy is the measure of \_\_\_\_\_.  
 a) Randomness                                        b) Information  
 c) Randomness & Information                    d) None of the mentioned
  
- 6) When the base of the logarithm is e, the unit of measure of information is \_\_\_\_\_.  
 a) Bits                                                      b) Bytes  
 c) Nats                                                    d) None of the mentioned
  
- 7) When X and Y are statistically independent, then  $I(x,y)$  is \_\_\_\_\_.  
 a) 1                                                          b) 0  
 c)  $\ln 2$                                                     d) Cannot be determined
  
- 8) Analog information is converted to digital data using \_\_\_\_\_.  
 a) Sampling                                              b) Quantization  
 c) Coding                                                 d) All of the mentioned



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Set **R**

**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

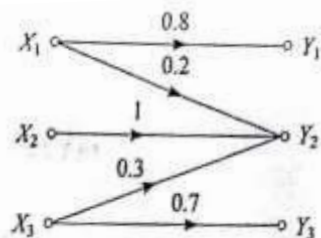
- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.**

**16**

- a) 1) Define Entropy.  
 2) Calculate the joint probability matrix and  $P(Y)$  for a given channel below with the probability of messages  $x_1$ ,  $x_2$ , and  $x_3$  as 0.3, 0.4, and 0.5.



- b) With the help of a block diagram explain the PCM system.  
 c) Illustrate with an example what is uniform quantization.  
 d) Compare ASK, FSK, PSK and DPSK.  
 e) What are different line coding techniques. State its advantages and disadvantages.

**Q.3 Attempt any two.**

**12**

- a) Apply the Shannon-Fano coding procedure for the following message ensemble for  $M=2$ .

$$[X] = [x_1 \ x_2 \ x_3 \ x_4 \ x_5 \ x_6 \ x_7 \ x_8]$$

$$[P] = [1/4 \ 1/8 \ 1/16 \ 1/16 \ 1/16 \ 1/4 \ 1/16 \ 1/8]$$

- b) With the help of a block diagram and waveform, explain the working of the Delta Modulation transmitter. What are the drawbacks of the DM technique?  
 c) With an example explain the working of the DPSK transmitter and receiver.

**Section - II**

**Q.4 Answer any four questions.**

**16**

- a) Explain QPSK transmitter in detail.  
 b) Explain M-ary wideband FSK demodulation.  
 c) Describe Costas Loop method of carrier recovery system.  
 d) What is significance of multicarrier system?

- e) For a (6, 3) code, the parity check matrix is as shown. Determine whether a received code vector is erroneous. The received code vector is 100101.

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

**Q.5 Answer any two questions.**

**12**

- a) Explain how to minimize peak to average power ratio in a multicarrier system.
- b) What are different symbol synchronization methods? Explain DTTL method in detail.
- c) Write a note on QAM transmitter and receiver.

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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following gives maximum probability of error?
 

|        |         |
|--------|---------|
| a) ASK | b) FSK  |
| c) PSK | d) DPSK |
- 2) For non coherent reception of PSK \_\_\_\_\_ is used.
 

|                                     |
|-------------------------------------|
| a) Differential encoding            |
| b) Decoding                         |
| c) Differential encoding & Decoding |
| d) None of the mentioned            |
- 3) If carrier modulated by a digital bit stream had one of the possible phases 0, 90, 180 & 270, then modulation is called
 

|         |         |
|---------|---------|
| a) BPSK | b) QPSK |
| c) QAM  | d) MSK  |
- 4) The error performance of MPSK \_\_\_\_\_ as M increases.
 

|                   |                          |
|-------------------|--------------------------|
| a) Increases      | b) Decreases             |
| c) Stays constant | d) None of the mentioned |
- 5) In phase lock which parameter is synchronized \_\_\_\_\_.
 

|                      |                          |
|----------------------|--------------------------|
| a) Frequency         | b) Phase                 |
| c) Frequency & Phase | d) None of the mentioned |
- 6) A correlation receiver consists of \_\_\_\_\_.
 

|                              |                       |
|------------------------------|-----------------------|
| a) a multiplier & integrator | b) an integrator only |
| c) multiplier only           | d) adder & integrator |
- 7) A major problem of multicarrier modulation is \_\_\_\_\_.
 

|                                     |
|-------------------------------------|
| a) Fading                           |
| b) Diversity                        |
| c) High peak-to-average power ratio |
| d) None of these                    |





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**S.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Principles of Digital Communication**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

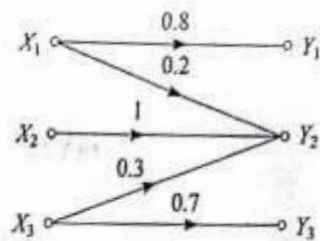
- Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

**Q.2 Attempt any four.**

**16**

- a) 1) Define Entropy.  
 2) Calculate the joint probability matrix and  $P(Y)$  for a given channel below with the probability of messages  $x_1$ ,  $x_2$ , and  $x_3$  as 0.3, 0.4, and 0.5.



- b) With the help of a block diagram explain the PCM system.  
 c) Illustrate with an example what is uniform quantization.  
 d) Compare ASK, FSK, PSK and DPSK.  
 e) What are different line coding techniques. State its advantages and disadvantages.

**Q.3 Attempt any two.**

**12**

- a) Apply the Shannon-Fano coding procedure for the following message ensemble for  $M=2$ .

$$[X] = [x_1 \ x_2 \ x_3 \ x_4 \ x_5 \ x_6 \ x_7 \ x_8]$$

$$[P] = [1/4 \ 1/8 \ 1/16 \ 1/16 \ 1/16 \ 1/4 \ 1/16 \ 1/8]$$

- b) With the help of a block diagram and waveform, explain the working of the Delta Modulation transmitter. What are the drawbacks of the DM technique?  
 c) With an example explain the working of the DPSK transmitter and receiver.

**Section - II**

**Q.4 Answer any four questions.**

**16**

- a) Explain QPSK transmitter in detail.  
 b) Explain M-ary wideband FSK demodulation.  
 c) Describe Costas Loop method of carrier recovery system.  
 d) What is significance of multicarrier system?

- e) For a (6, 3) code, the parity check matrix is as shown. Determine whether a received code vector is erroneous. The received code vector is 100101.

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

**Q.5 Answer any two questions.**

**12**

- a) Explain how to minimize peak to average power ratio in a multicarrier system.
- b) What are different symbol synchronization methods? Explain DTTL method in detail.
- c) Write a note on QAM transmitter and receiver.

**Seat  
No.**

Max. Marks: 70

Marks: 14

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- Page 1 of 16



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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required & state the assumptions

**Section – I**

**Q.2 Attempt any Four.**

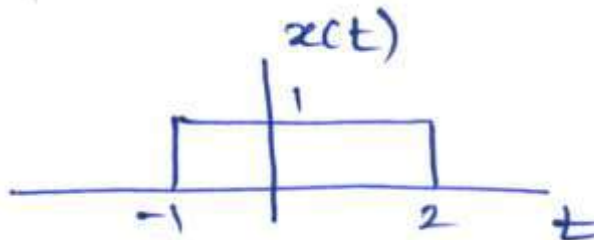
**16**

- 1) Consider the signal  $x[n] = \{1, 3, 4, 2, 3\}$  Sketch & label following signals



i.  $x[n-1]$  ii.  $x[n+2]$  iii.  $x[-n]$  iv.  $x[n]u[n-1]$

- 2) Obtain and sketch the even and odd parts of the continuous time signal  $x(t)$  shown below.



- 3) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.  
 i.  $x[n] = u[n-1]$  ii.  $x(t) = e^{j5\pi t}u(t+1)$
- 4) State the Trigonometric Fourier series & derive the expression for computing the coefficients  $a_0$  &  $a_n$  of Trigonometric Fourier Series.
- 5) Consider the system whose input output relation is as given below  
 $y[n] = x[n+1]$

Determine which of the following properties hold & which does not hold by above system. Justify your answers.

i. Memory less ii. Linear iii. Causal iv. Stable

**Q.3 Attempt any two:**

**12**

- 1) Compute convolution sum of  $y[n] = x[n] * h[n]$  of the following signals  
 $X[n] = u[n-1]$  and  $h[n] = u[n]$
- 2) Determine the Trigonometric Fourier series representation for the following signals  $x(t)$  periodic with period 2 and  $x(t) = \begin{cases} -1 & -1 < t < 0 \\ 1 & 0 \leq t < 1 \end{cases}$
- 3) Consider the LTI systems with following impulse responses  
 i)  $h[n] = (0.5)^n u[n]$   
 ii)  $h(t) = e^{-3t} u(t+1)$

Determine whether each of the above system is causal and or stable.  
 Justify your answers

## Section – II

**Q.4 Attempt any Four.****16**

- 1) Explain how to represent periodic signal using Fourier transform.
- 2) Explain in brief sample with zero order hold.
- 3) Obtain the Fourier transform of  $x(t) = e^{-at}u(t)$ ,  $a > 0$
- 4) Explain Aliasing and how it is reduced.
- 5) State the conditions for ROC of system function  $H(z)$  of an LTI system to be i. stable & ii. Causal. Determine whether following system is stable and or causal for each of the ROC given below.

$$h(z) = \frac{z}{z - 1/2} + \frac{z}{z - 3}$$

- i)  $|z| < (1/2)$     ii)  $(1/2) < |z| < 3$     iii)  $|z| > 3$

**Q.5 Attempt any two:****12**

- 1) State and explain the sampling theorem for continuous time signals.
- 2) The analog signal given below is sampled at 600 samples per second

$$x(t) = 2 \sin(480\pi) + 3 \sin(720\pi)$$

Calculate

- i) Nyquist sampling rate
- ii) Folding frequency
- 3) Compute Fourier transform of following signals. Sketch magnitude transforms.
  - i)  $x_1(t) = e^{-2(t-1)}(u(t-1))$
  - ii)  $x(t) = \delta(t-1)$

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Fourier transform of  $\frac{dx(t)}{dt}$  is \_\_\_\_\_
  - a)  $x(j\omega)$
  - b)  $\frac{1}{j\omega}x(j\omega)$
  - c)  $j\omega x(j\omega)$
  - d)  $e^{j\omega}x(j\omega)$
- 2) The sinc function can be defined as  $\text{SINC}(x) = \frac{\sin x}{x}$ 
  - a)  $\frac{\sin x}{x}$
  - b)  $\frac{\sin \pi x}{x}$
  - c)  $\frac{\sin \pi x}{\pi x}$
  - d)  $\text{SINC}\left(\frac{\sin x}{x}\right)$
- 3) A function having frequency  $f$  is to be sampled. The sampling time  $T$  should be \_\_\_\_\_
  - a)  $T = \frac{1}{2f}$
  - b)  $T > \frac{1}{2f}$
  - c)  $T < \frac{1}{2f}$
  - d)  $T \geq \frac{1}{2f}$
- 4) Fourier transform of unity is \_\_\_\_\_
  - a)  $\delta(\omega)$
  - b)  $\pi \delta(\omega)$
  - c)  $2\pi \delta(\omega)$
  - d) unit step signal
- 5) if  $x(t)$  signal is multiplied with train of impulses, the process is \_\_\_\_\_.
  - a) convolution
  - b) Z transform
  - c) Sampling
  - d) Laplace transform
- 6) If sampling frequency is 1000 Hz, then for proper recovery of signal the signal frequency should be \_\_\_\_\_.
  - a)  $\geq 2000 \text{ Hz}$
  - b)  $\geq 1000 \text{ Hz}$
  - c)  $\geq 500 \text{ Hz}$
  - d)  $\leq 500 \text{ Hz}$



- Page 6 of 16

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required & state the assumptions

**Section – I**

**Q.2 Attempt any Four.**

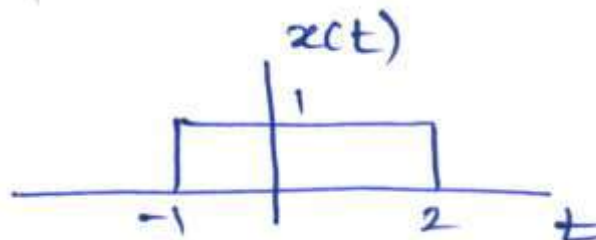
**16**

- 1) Consider the signal  $x[n] = \{1, 3, 4, 2, 3\}$  Sketch & label following signals



i.  $x[n-1]$  ii.  $x[n+2]$  iii.  $x[-n]$  iv.  $x[n]u[n-1]$

- 2) Obtain and sketch the even and odd parts of the continuous time signal  $x(t)$  shown below.



- 3) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.  
 i.  $x[n] = u[n-1]$  ii.  $x(t) = e^{j5\pi t}u(t+1)$
- 4) State the Trigonometric Fourier series & derive the expression for computing the coefficients  $a_0$  &  $a_n$  of Trigonometric Fourier Series.
- 5) Consider the system whose input output relation is as given below  
 $y[n] = x[n+1]$

Determine which of the following properties hold & which does not hold by above system. Justify your answers.

i. Memory less ii. Linear iii. Causal iv. Stable

**Q.3 Attempt any two:**

**12**

- 1) Compute convolution sum of  $y[n] = x[n] * h[n]$  of the following signals  
 $X[n] = u[n-1]$  and  $h[n] = u[n]$
- 2) Determine the Trigonometric Fourier series representation for the following signals  $x(t)$  periodic with period 2 and  $x(t) = \begin{cases} -1 & -1 < t < 0 \\ 1 & 0 \leq t < 1 \end{cases}$
- 3) Consider the LTI systems with following impulse responses  
 i)  $h[n] = (0.5)^n u[n]$   
 ii)  $h(t) = e^{-3t} u(t+1)$   
 Determine whether each of the above system is causal and or stable. Justify your answers

## Section – II

**Q.4 Attempt any Four.****16**

- 1) Explain how to represent periodic signal using Fourier transform.
- 2) Explain in brief sample with zero order hold.
- 3) Obtain the Fourier transform of  $x(t) = e^{-at}u(t)$ ,  $a > 0$
- 4) Explain Aliasing and how it is reduced.
- 5) State the conditions for ROC of system function  $H(z)$  of an LTI system to be i. stable & ii. Causal. Determine whether following system is stable and or causal for each of the ROC given below.

$$h(z) = \frac{z}{z - 1/2} + \frac{z}{z - 3}$$

- i)  $|z| < (1/2)$     ii)  $(1/2) < |z| < 3$     iii)  $|z| > 3$

**Q.5 Attempt any two:****12**

- 1) State and explain the sampling theorem for continuous time signals.
- 2) The analog signal given below is sampled at 600 samples per second  
 $x(t) = 2 \sin(480\pi) + 3 \sin(720\pi)$   
 Calculate  
 i) Nyquist sampling rate  
 ii) Folding frequency
- 3) Compute Fourier transform of following signals. Sketch magnitude transforms.  
 i)  $x_1(t) = e^{-2(t-1)}(u(t-1))$   
 ii)  $x(t) = \delta(t-1)$

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Day & Date: Friday, 10-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Fourier transform of unity is \_\_\_\_\_.  
a)  $\delta(\omega)$   
b)  $\pi \delta(\omega)$   
c)  $2\pi \delta(\omega)$   
d) unit step signal
- 2) if  $x(t)$  signal is multiplied with train of impulses, the process is \_\_\_\_\_.  
a) convolution  
b) Z transform  
c) Sampling  
d) Laplace transform
- 3) If sampling frequency is 1000 Hz, then for proper recovery of signal the signal frequency should be \_\_\_\_\_.  
a)  $\geq 2000 \text{ Hz}$   
b)  $\geq 1000 \text{ Hz}$   
c)  $\geq 500 \text{ Hz}$   
d)  $\leq 500 \text{ Hz}$
- 4) Which of the following is the method used for reconstruction of signal from its samples \_\_\_\_\_.  
a) Zero order hold  
b) Linear interpolation  
c) Both a) and b)  
d) None of these
- 5)  $y(t) = x(t + 3)$  is \_\_\_\_\_.  
a) Casual  
b) Invertible  
c) Non casual and invertible  
d) Memory less
- 6) the range of  $n$  for which the signal  $u(n + 1) - 2u(n - 2)$  exists is \_\_\_\_\_.  
a)  $-2$  to  $2$   
b)  $-1$  to  $1$   
c)  $-1$  to  $\infty$   
d)  $-3$  to  $2$
- 7) A system is having impulse response  $h(t)$  will be BIBO stable of \_\_\_\_\_.  
a)  $\int_{-\infty}^{\infty} |h(t)| > \infty$   
b)  $\int_{-\infty}^{\infty} |h(t)| < \infty$   
c)  $\int_{-\infty}^{\infty} |h(t)| = 0$   
d)  $\int_{-\infty}^{\infty} |h(t)| = 1$

- 8) Two systems with impulse responses  $h_1(t)$  and  $h_2(t)$  are connected in cascade. Then the overall impulse response of the cascaded system is given by \_\_\_\_\_
- product of  $h_1(t)$  and  $h_2(t)$
  - sum of  $h_1(t)$  and  $h_2(t)$
  - convolution of  $h_1(t)$  and  $h_2(t)$
  - subtraction of  $h_2(t)$  from  $h_1(t)$
- 9) The fundamental period  $T$  of continuous time signal  $je^{j2t}$  is \_\_\_\_\_
- $\pi \text{ sec}$
  - $0.4 \pi \text{ sec}$
  - $0.3 \pi \text{ sec}$
  - $0.5 \pi \text{ sec}$
- 10) An LTI system is said to be causal if and only if \_\_\_\_\_
- Impulse response is non-zero for positive values of  $n$
  - Impulse response is zero for positive values of  $n$
  - Impulse response is non-zero for negative values of  $n$
  - Impulse response is zero for negative values of  $n$
- 11)  $m(t)$  is an even function, then its Fourier representation has \_\_\_\_\_
- $a_0 = 0$
  - $a_n = 0$
  - $b_n = 0$
  - $a_n = b_n$
- 12) Fourier transform of  $\frac{dx(t)}{dt}$  is \_\_\_\_\_
- $x(j\omega)$
  - $\frac{1}{j\omega}x(j\omega)$
  - $j\omega x(j\omega)$
  - $e^{j\omega}x(j\omega)$
- 13) The sinc function can be defined as  $\text{SINC}(x) = \frac{\sin x}{x}$
- $\frac{\sin x}{x}$
  - $\frac{\sin \pi x}{x}$
  - $\frac{\sin \pi x}{\pi x}$
  - $\text{SINC}\left(\frac{\sin x}{x}\right)$
- 14) A function having frequency  $f$  is to be sampled. The sampling time  $T$  should be \_\_\_\_\_
- $T = \frac{1}{2f}$
  - $T > \frac{1}{2f}$
  - $T < \frac{1}{2f}$
  - $T \geq \frac{1}{2f}$

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if required & state the assumptions

**Section – I**

**Q.2 Attempt any Four.**

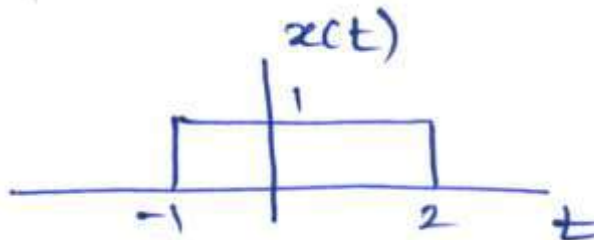
**16**

- 1) Consider the signal  $x[n] = \{1, 3, 4, 2, 3\}$  Sketch & label following signals



i.  $x[n-1]$  ii.  $x[n+2]$  iii.  $x[-n]$  iv.  $x[n]u[n-1]$

- 2) Obtain and sketch the even and odd parts of the continuous time signal  $x(t)$  shown below.



- 3) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.  
 i.  $x[n] = u[n-1]$  ii.  $x(t) = e^{j5\pi t}u(t+1)$
- 4) State the Trigonometric Fourier series & derive the expression for computing the coefficients  $a_0$  &  $a_n$  of Trigonometric Fourier Series.
- 5) Consider the system whose input output relation is as given below  
 $y[n] = x[n+1]$

Determine which of the following properties hold & which does not hold by above system. Justify your answers.

i. Memory less ii. Linear iii. Causal iv. Stable

**Q.3 Attempt any two:**

**12**

- 1) Compute convolution sum of  $y[n] = x[n] * h[n]$  of the following signals  
 $X[n] = u[n-1]$  and  $h[n] = u[n]$
- 2) Determine the Trigonometric Fourier series representation for the following signals  $x(t)$  periodic with period 2 and  $x(t) = \begin{cases} -1 & -1 < t < 0 \\ 1 & 0 \leq t < 1 \end{cases}$
- 3) Consider the LTI systems with following impulse responses  
 i)  $h[n] = (0.5)^n u[n]$   
 ii)  $h(t) = e^{-3t} u(t+1)$

Determine whether each of the above system is causal and or stable.  
 Justify your answers

## Section – II

**Q.4 Attempt any Four.****16**

- 1) Explain how to represent periodic signal using Fourier transform.
- 2) Explain in brief sample with zero order hold.
- 3) Obtain the Fourier transform of  $x(t) = e^{-at}u(t)$ ,  $a > 0$
- 4) Explain Aliasing and how it is reduced.
- 5) State the conditions for ROC of system function  $H(z)$  of an LTI system to be i. stable & ii. Causal. Determine whether following system is stable and or causal for each of the ROC given below.

$$h(z) = \frac{z}{z - 1/2} + \frac{z}{z - 3}$$

- i)  $|z| < (1/2)$     ii)  $(1/2) < |z| < 3$     iii)  $|z| > 3$

**Q.5 Attempt any two:****12**

- 1) State and explain the sampling theorem for continuous time signals.
- 2) The analog signal given below is sampled at 600 samples per second  
 $x(t) = 2 \sin(480\pi) + 3 \sin(720\pi)$   
 Calculate  
 i) Nyquist sampling rate  
 ii) Folding frequency
- 3) Compute Fourier transform of following signals. Sketch magnitude transforms.  
 i)  $x_1(t) = e^{-2(t-1)}(u(t-1))$   
 ii)  $x(t) = \delta(t-1)$

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S

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) An LTI system is said to be causal if and only if \_\_\_\_\_
  - a) Impulse response is non-zero for positive values of  $n$
  - b) Impulse response is zero for positive values of  $n$
  - c) Impulse response is non-zero for negative values of  $n$
  - d) Impulse response is zero for negative values of  $n$
- 2)  $m(t)$  is an even function, then its Fourier representation has \_\_\_\_\_
  - a)  $a_0 = 0$
  - b)  $a_n = 0$
  - c)  $b_n = 0$
  - d)  $a_n = b_n$
- 3) Fourier transform of  $\frac{dx(t)}{dt}$  is \_\_\_\_\_
  - a)  $x(j\omega)$
  - b)  $\frac{1}{j\omega}x(j\omega)$
  - c)  $j\omega x(j\omega)$
  - d)  $e^{j\omega}x(j\omega)$
- 4) The sinc function can be defined as  $\text{SINC}(x) = \frac{\sin x}{x}$ 
  - a)  $\frac{\sin x}{x}$
  - b)  $\frac{\sin \pi x}{x}$
  - c)  $\frac{\sin \pi x}{\pi x}$
  - d)  $\text{SINC}\left(\frac{\sin x}{x}\right)$
- 5) A function having frequency  $f$  is to be sampled. The sampling time  $T$  should be \_\_\_\_\_
  - a)  $T = \frac{1}{2f}$
  - b)  $T > \frac{1}{2f}$
  - c)  $T < \frac{1}{2f}$
  - d)  $T \geq \frac{1}{2f}$
- 6) Fourier transform of unity is \_\_\_\_\_
  - a)  $\delta(\omega)$
  - b)  $\pi \delta(\omega)$
  - c)  $2\pi \delta(\omega)$
  - d) unit step signal



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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRONICS & TELECOMMUNICATION ENGINEERING**  
**Signals and Systems**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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 3) Assume suitable data if required & state the assumptions

**Section – I**

**Q.2 Attempt any Four.**

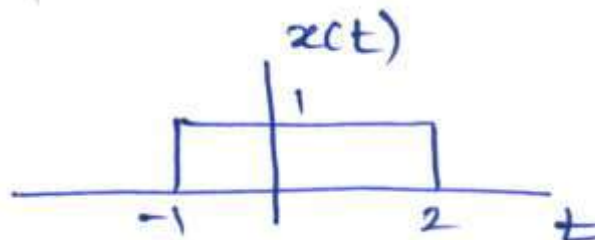
**16**

- 1) Consider the signal  $x[n] = \{1, 3, 4, 2, 3\}$  Sketch & label following signals



i.  $x[n-1]$  ii.  $x[n+2]$  iii.  $x[-n]$  iv.  $x[n]u[n-1]$

- 2) Obtain and sketch the even and odd parts of the continuous time signal  $x(t)$  shown below.



- 3) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.  
 i.  $x[n] = u[n-1]$  ii.  $x(t) = e^{j5\pi t}u(t+1)$
- 4) State the Trigonometric Fourier series & derive the expression for computing the coefficients  $a_0$  &  $a_n$  of Trigonometric Fourier Series.
- 5) Consider the system whose input output relation is as given below  
 $y[n] = x[n+1]$

Determine which of the following properties hold & which does not hold by above system. Justify your answers.

i. Memory less ii. Linear iii. Causal iv. Stable

**Q.3 Attempt any two:**

**12**

- 1) Compute convolution sum of  $y[n] = x[n] * h[n]$  of the following signals  
 $X[n] = u[n-1]$  and  $h[n] = u[n]$
- 2) Determine the Trigonometric Fourier series representation for the following signals  $x(t)$  periodic with period 2 and  $x(t) = \begin{cases} -1 & -1 < t < 0 \\ 1 & 0 \leq t < 1 \end{cases}$
- 3) Consider the LTI systems with following impulse responses  
 i)  $h[n] = (0.5)^n u[n]$   
 ii)  $h(t) = e^{-3t} u(t+1)$   
 Determine whether each of the above system is causal and or stable. Justify your answers

## Section – II

**Q.4 Attempt any Four.****16**

- 1) Explain how to represent periodic signal using Fourier transform.
- 2) Explain in brief sample with zero order hold.
- 3) Obtain the Fourier transform of  $x(t) = e^{-at}u(t)$ ,  $a > 0$
- 4) Explain Aliasing and how it is reduced.
- 5) State the conditions for ROC of system function  $H(z)$  of an LTI system to be i. stable & ii. Causal. Determine whether following system is stable and or causal for each of the ROC given below.

$$h(z) = \frac{z}{z - 1/2} + \frac{z}{z - 3}$$

- i)  $|z| < (1/2)$     ii)  $(1/2) < |z| < 3$     iii)  $|z| > 3$

**Q.5 Attempt any two:****12**

- 1) State and explain the sampling theorem for continuous time signals.
- 2) The analog signal given below is sampled at 600 samples per second  
 $x(t) = 2 \sin(480\pi) + 3 \sin(720\pi)$   
 Calculate  
 i) Nyquist sampling rate  
 ii) Folding frequency
- 3) Compute Fourier transform of following signals. Sketch magnitude transforms.  
 i)  $x_1(t) = e^{-2(t-1)}(u(t-1))$   
 ii)  $x(t) = \delta(t-1)$

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Set **P**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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**MCQ/Objective Type Questions**

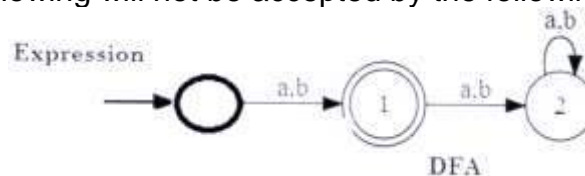
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following will not be accepted by the following DFA?



- a) ababaabaa                      b) abbbbaa  
 c) abbbbaabb                    d) none
- 2) Can a DFA recognize a palindrome number?  
 a) Yes                                b) No  
 c) Yes, with input alphabet as  $\Sigma^*$     d) Can't be determined
- 3) Which of the following does not represents the given language?  
 Language:  $\{0,01\}$   
 a)  $0 + 01$                               b)  $\{0\} \cup \{0\}$   
 c)  $\{0\} \cup \{0\}\{1\}$                       d)  $\{0\} \wedge \{01\}$
- 4) A regular language over an alphabet a is one that can be obtained from \_\_\_\_\_.  
 a) union                                b) concatenation  
 c) Kleene                                d) All of the mentioned
- 5) Which of the following is a regular language?  
 a) String whose length is a sequence of prime numbers  
 b) String with substring  $ww^r$  in between  
 c) Palindrome string  
 d) String with even number of Zero's
- 6) Following context free grammar  
 $S \rightarrow aB \mid bA$   
 $A \rightarrow b \mid aS \mid bAA$   
 $B \rightarrow b \mid bS \mid aBB$  generates strings of terminals that have \_\_\_\_\_.  
 a) equal number of a's and b's  
 b) odd number of a's and odd number b's  
 c) even number of a's and even number of b's  
 d) None

- 7) The regular expression with all strings of 0's and 1's with at least two consecutive 0's, is \_\_\_\_\_.  
 a)  $1 + (10)^*$  b)  $(0 + 1)^*00(0 + 1)^*$   
 c)  $(0 + 1)^*011$  d)  $0^*1^*2^*$
- 8) In one move the turing machine:  
 a) May change its state  
 b) Write a symbol on the cell being scanned  
 c) Move the head one position left or right  
 d) All of the above
- 9) A push down automata is different than finite automata by \_\_\_\_\_.  
 a) Its memory (stack) b) Number of states  
 c) Both (a) and (b) d) None of these
- 10) In the Universal TM, the non-halting states of a TM T1 are encoded as \_\_\_\_\_.  
 a)  $s(q_i) = 0^{i+1}$  b)  $e(q_i) = 0i + 2$   
 c)  $s(q_i) = 0i$  d)  $s(q_i) = 0i + 2$
- 11) Which of the following is not true?  
 a) Power of deterministic automata is equivalent to power of non-deterministic automata  
 b) Power of deterministic pushdown automata is equivalent to power of non-deterministic pushdown automata  
 c) Power of deterministic TM is equivalent to power of non-deterministic TM.  
 d) All above
- 12) The  $\delta$  (transition function) for PDA is \_\_\_\_\_.  
 a)  $\delta : Q \times \Sigma \times \Gamma^* \Rightarrow Q \times \Gamma^*$  b)  $\delta : Q \times \Sigma \Rightarrow Q \times \Gamma^*$   
 c)  $\delta : Q \times \Gamma^* \Rightarrow \Sigma \times \Gamma^*$  d)  $\delta : Q \times \Gamma^* \Rightarrow Q \times \Sigma$
- 13) The instantaneous description is PDA shows \_\_\_\_\_.  
 a) Present state b) Stack symbol  
 c) String to be processed d) All of these
- 14) Alan Turing introduced Turing machine in late \_\_\_\_\_.  
 a) 1936 b) 1938  
 c) 1940 d) 1942

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P

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- 1) What is a  $\delta$  symbol? Explain.
- 2) Determine whether the grammar G has a useless production.
- 3) Define: (i) Finite Automaton (FA) (ii) NFA.
- 4) Define CNF.

**Q.3 Attempt any two:** **16**

- 1) Explain Kleene's theorem.
- 2) Write short notes on Minimization of DFA with example.
- 3) Define and explain types of grammars and languages.

**Section – II**

**Q.4 Attempt any three.** **12**

- 1) TM with semi infinite tape.
- 2) Define PDA and explain types of PDA.
- 3) Design a TM to recognize all strings consisting of an odd number of  $a$ 's.
- 4) Prove that  $L = \{0^p \mid p \text{ is prime}\}$  is not CFL.

**Q.5 Attempt any two:** **16**

- 1) Explain the following.
  - a) TM with multiple track
  - b) Offline TM
- 2) Write a note on Universal TM.
- 3) State pumping lemma. Prove that  $L = \{a^i b^i c^i \mid i \geq 0\}$  is not regular

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

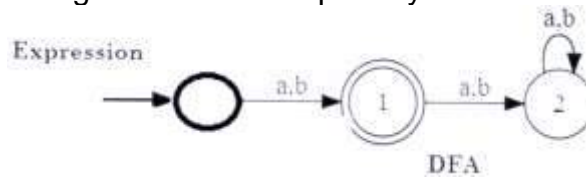
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In one move the turing machine:
  - a) May change its state
  - b) Write a symbol on the cell being scanned
  - c) Move the head one position left or right
  - d) All of the above
- 2) A push down automata is different than finite automata by \_\_\_\_\_.
  - a) Its memory (stack)
  - b) Number of states
  - c) Both (a) and (b)
  - d) None of these
- 3) In the Universal TM, the non-halting states of a TM T1 are encoded as \_\_\_\_\_.
  - a)  $s(q_i) = 0^{i+1}$
  - b)  $e(q_i) = 0i + 2$
  - c)  $s(q_i) = 0i$
  - d)  $s(q_i) = 0i + 2$
- 4) Which of the following is not true?
  - a) Power of deterministic automata is equivalent to power of non-deterministic automata
  - b) Power of deterministic pushdown automata is equivalent to power of non-deterministic pushdown automata
  - c) Power of deterministic TM is equivalent to power of non-deterministic TM.
  - d) All above
- 5) The  $\delta$  (transition function) for PDA is \_\_\_\_\_.
  - a)  $\delta : Q \times \Sigma \times \Gamma^* \Rightarrow Q \times \Gamma^*$
  - b)  $\delta : Q \times \Sigma \Rightarrow Q \times \Gamma^*$
  - c)  $\delta : Q \times \Gamma^* \Rightarrow \Sigma \times \Gamma^*$
  - d)  $\delta : Q \times \Gamma^* \Rightarrow Q \times \Sigma$
- 6) The instantaneous description is PDA shows \_\_\_\_\_.
  - a) Present state
  - b) Stack symbol
  - c) String to be processed
  - d) All of these
- 7) Alan Turing introduced Turing machine in late \_\_\_\_\_.
  - a) 1936
  - b) 1938
  - c) 1940
  - d) 1942

- 8) Which of the following will not be accepted by the following DFA?



- a) ababaabaa                      b) abbbbaa  
c) abbbbaabb                    d) none
- 9) Can a DFA recognize a palindrome number?  
a) Yes                                b) No  
c) Yes, with input alphabet as  $\Sigma^*$     d) Can't be determined
- 10) Which of the following does not represent the given language?  
Language:  $\{0,01\}$   
a)  $0 + 01$                               b)  $\{0\} \cup \{0\}$   
c)  $\{0\} \cup \{0\}\{1\}$                     d)  $\{0\} \wedge \{01\}$
- 11) A regular language over an alphabet  $a$  is one that can be obtained from \_\_\_\_\_.  
a) union                                b) concatenation  
c) Kleene                                d) All of the mentioned
- 12) Which of the following is a regular language?  
a) String whose length is a sequence of prime numbers  
b) String with substring  $ww^r$  in between  
c) Palindrome string  
d) String with even number of Zero's
- 13) Following context free grammar  
 $S \rightarrow aB \mid bA$   
 $A \rightarrow b \mid aS \mid bAA$   
 $B \rightarrow b \mid bS \mid aBB$  generates strings of terminals that have \_\_\_\_\_.  
 a) equal number of a's and b's  
 b) odd number of a's and odd number b's  
 c) even number of a's and even number of b's  
 d) None
- 14) The regular expression with all strings of 0's and 1's with at least two consecutive 0's, is \_\_\_\_\_.  
 a)  $1 + (10)^*$                               b)  $(0 + 1)^*00(0 + 1)^*$   
 c)  $(0 + 1)^*011$                             d)  $0^*1^*2^*$



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- 1) What is a  $\delta$  symbol? Explain.
- 2) Determine whether the grammar G has a useless production.
- 3) Define: (i) Finite Automaton (FA) (ii) NFA.
- 4) Define CNF.

**Q.3 Attempt any two:** **16**

- 1) Explain Kleene's theorem.
- 2) Write short notes on Minimization of DFA with example.
- 3) Define and explain types of grammars and languages.

**Section – II**

**Q.4 Attempt any three.** **12**

- 1) TM with semi infinite tape.
- 2) Define PDA and explain types of PDA.
- 3) Design a TM to recognize all strings consisting of an odd number of  $a$ 's.
- 4) Prove that  $L = \{0^p \mid p \text{ is prime}\}$  is not CFL.

**Q.5 Attempt any two:** **16**

- 1) Explain the following.
  - a) TM with multiple track
  - b) Offline TM
- 2) Write a note on Universal TM.
- 3) State pumping lemma. Prove that  $L = \{a^i b^i c^i \mid i \geq 0\}$  is not regular

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Set **R**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

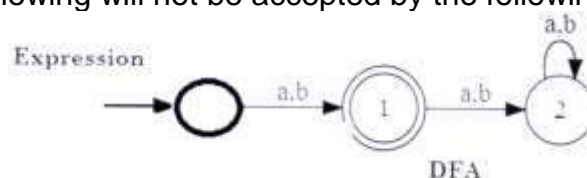
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is not true?
  - a) Power of deterministic automata is equivalent to power of non-deterministic automata
  - b) Power of deterministic pushdown automata is equivalent to power of non-deterministic pushdown automata
  - c) Power of deterministic TM is equivalent to power of non-deterministic TM.
  - d) All above
- 2) The  $\delta$  (transition function) for PDA is \_\_\_\_\_.
  - a)  $\delta : Q \times \Sigma \times \Gamma^* \Rightarrow Q \times \Gamma^*$
  - b)  $\delta : Q \times \Sigma \Rightarrow Q \times \Gamma^*$
  - c)  $\delta : Q \times \Gamma^* \Rightarrow \Sigma \times \Gamma^*$
  - d)  $\delta : Q \times \Gamma^* \Rightarrow Q \times \Sigma$
- 3) The instantaneous description is PDA shows \_\_\_\_\_.
  - a) Present state
  - b) Stack symbol
  - c) String to be processed
  - d) All of these
- 4) Alan Turing introduced Turing machine in late \_\_\_\_\_.
  - a) 1936
  - b) 1938
  - c) 1940
  - d) 1942
- 5) Which of the following will not be accepted by the following DFA?



- a) ababaabaa
  - b) abbbbaa
  - c) abbbbaabb
  - d) none
- 6) Can a DFA recognize a palindrome number?
  - a) Yes
  - b) No
  - c) Yes, with input alphabet as  $\Sigma^*$
  - d) Can't be determined
- 7) Which of the following does not represents the given language?  
 Language:  $\{0,01\}$ 
  - a)  $0 + 01$
  - b)  $\{0\} \cup \{0\}$
  - c)  $\{0\} \cup \{0\}\{1\}$
  - d)  $\{0\} \wedge \{01\}$

- Page 8 of 12

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| Set | R |
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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- 1) What is a  $\delta$  symbol? Explain.
- 2) Determine whether the grammar G has a useless production.
- 3) Define: (i) Finite Automaton (FA) (ii) NFA.
- 4) Define CNF.

**Q.3 Attempt any two:** **16**

- 1) Explain Kleene's theorem.
- 2) Write short notes on Minimization of DFA with example.
- 3) Define and explain types of grammars and languages.

**Section – II**

**Q.4 Attempt any three.** **12**

- 1) TM with semi infinite tape.
- 2) Define PDA and explain types of PDA.
- 3) Design a TM to recognize all strings consisting of an odd number of  $a$ 's.
- 4) Prove that  $L = \{0^p \mid p \text{ is prime}\}$  is not CFL.

**Q.5 Attempt any two:** **16**

- 1) Explain the following.
  - a) TM with multiple track
  - b) Offline TM
- 2) Write a note on Universal TM.
- 3) State pumping lemma. Prove that  $L = \{a^i b^i c^i \mid i \geq 0\}$  is not regular

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Set **S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

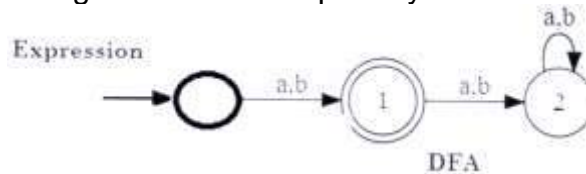
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Following context free grammar  
 $S \rightarrow aB \mid bA$   
 $A \rightarrow b \mid aS \mid bAA$   
 $B \rightarrow b \mid bS \mid aBB$  generates strings of terminals that have \_\_\_\_\_.  
 a) equal number of a's and b's  
 b) odd number of a's and odd number b's  
 c) even number of a's and even number of b's  
 d) None
- 2) The regular expression with all strings of 0's and 1's with at least two consecutive 0's, is \_\_\_\_\_.  
 a)  $1 + (10)^*$   
 b)  $(0 + 1)^*00(0 + 1)^*$   
 c)  $(0 + 1)^*011$   
 d)  $0^*1^*2^*$
- 3) In one move the turing machine:  
 a) May change its state  
 b) Write a symbol on the cell being scanned  
 c) Move the head one position left or right  
 d) All of the above
- 4) A push down automata is different than finite automata by \_\_\_\_\_.  
 a) Its memory (stack)  
 b) Number of states  
 c) Both (a) and (b)  
 d) None of these
- 5) In the Universal TM, the non-halting states of a TM T1 are encoded as \_\_\_\_\_.  
 a)  $s(q_i) = 0^{i+1}$   
 b)  $e(q_i) = 0i + 2$   
 c)  $s(q_i) = 0i$   
 d)  $s(q_i) = 0i + 2$
- 6) Which of the following is not true?  
 a) Power of deterministic automata is equivalent to power of non-deterministic automata  
 b) Power of deterministic pushdown automata is equivalent to power of non-deterministic pushdown automata  
 c) Power of deterministic TM is equivalent to power of non-deterministic TM.  
 d) All above

- 7) The  $\delta$  (transition function) for PDA is \_\_\_\_\_.  
 a)  $\delta : Q \times \Sigma \times \Gamma \Rightarrow Q \times \Gamma^*$       b)  $\delta : Q \times \Sigma \Rightarrow Q \times \Gamma^*$   
 c)  $\delta : Q \times \Gamma \Rightarrow \Sigma \times \Gamma^*$       d)  $\delta : Q \times \Gamma \Rightarrow Q \times \Sigma$
- 8) The instantaneous description is PDA shows \_\_\_\_\_.  
 a) Present state      b) Stack symbol  
 c) String to be processed      d) All of these
- 9) Alan Turing introduced Turing machine in late \_\_\_\_\_.  
 a) 1936      b) 1938  
 c) 1940      d) 1942
- 10) Which of the following will not be accepted by the following DFA?



- a) ababaabaa      b) abbbbaa  
 c) abbbaabb      d) none
- 11) Can a DFA recognize a palindrome number?  
 a) Yes      b) No  
 c) Yes, with input alphabet as  $\Sigma^*$       d) Can't be determined
- 12) Which of the following does not represent the given language?  
 Language:  $\{0,01\}$   
 a)  $0 + 01$       b)  $\{0\} \cup \{0\}$   
 c)  $\{0\} \cup \{0\}\{1\}$       d)  $\{0\} \wedge \{01\}$
- 13) A regular language over an alphabet  $a$  is one that can be obtained from \_\_\_\_\_.  
 a) union      b) concatenation  
 c) Kleene      d) All of the mentioned
- 14) Which of the following is a regular language?  
 a) String whose length is a sequence of prime numbers  
 b) String with substring  $ww^r$  in between  
 c) Palindrome string  
 d) String with even number of Zero's

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Theory of Computation**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- 1) What is a  $\delta$  symbol? Explain.
- 2) Determine whether the grammar G has a useless production.
- 3) Define: (i) Finite Automaton (FA) (ii) NFA.
- 4) Define CNF.

**Q.3 Attempt any two:** **16**

- 1) Explain Kleene's theorem.
- 2) Write short notes on Minimization of DFA with example.
- 3) Define and explain types of grammars and languages.

**Section – II**

**Q.4 Attempt any three.** **12**

- 1) TM with semi infinite tape.
- 2) Define PDA and explain types of PDA.
- 3) Design a TM to recognize all strings consisting of an odd number of  $a$ 's.
- 4) Prove that  $L = \{0^p \mid p \text{ is prime}\}$  is not CFL.

**Q.5 Attempt any two:** **16**

- 1) Explain the following.
  - a) TM with multiple track
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- 2) Write a note on Universal TM.
- 3) State pumping lemma. Prove that  $L = \{a^i b^i c^i \mid i \geq 0\}$  is not regular

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Transmission control protocol \_\_\_\_\_.
  - a) is a connection-oriented protocol
  - b) uses a three way handshake to establish a connection
  - c) receives data from application as a single stream
  - d) all of these
- 2) Transport layer protocols deals with \_\_\_\_\_.
  - a) application to application communication
  - b) man to man communication
  - c) node to node communication
  - d) process to process communication
- 3) Which one of the following authentication method is used by SSH?
  - a) public-key
  - b) host based
  - c) password
  - d) all of these
- 4) Simple mail transfer protocol (SMTP) utilizes \_\_\_\_\_ as the transport layer protocol for electronic mail transfer.
  - a) DHCP
  - b) UDP
  - c) TCP
  - d) SCTP
- 5) If 5 files are transferred from server A to client B in the same session. The number of TCP connection between A and B is \_\_\_\_\_.
  - a) 6
  - b) 3
  - c) 9
  - d) 5
- 6) Mode of data transfer in FTP, where all these left to TCP:
  - a) Compressed mode
  - b) Block mode
  - c) Stream mode
  - d) None of these
- 7) The DHCP server \_\_\_\_\_.
  - a) Maintains a database of available IP addresses
  - b) Maintains the information about client configuration parameters
  - c) Grants a IP address when receives a request from a client
  - d) All of these



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) State and illustrate the different levels of network addressing?
- b) Extend with figure the client server paradigm?
- c) Summarize the fragmentation w.r.t. IP protocol?
- d) Explain in detail the congestion control in TCP?

**Q.3 Justify the following w.r.t. SCTP?** **08**

- a) Services
- b) Features
- c) Packet format

**OR**

Identify and illustrate all the socket system calls in socket interface?

**Q.4 Attempt any two** **08**

- a) User Datagram
- b) Special addresses
- c) Concurrency in Servers

**Section – II**

**Q.5 Attempt any three:** **12**

- a) Illustrate the message access agent w.r.t SMTP?
- b) Explain with figure the packet format of SSH?
- c) Extend the DHCP protocol with its transition state?
- d) Identify and illustrate the options and option negotiation from TELNET?

**Q.6 Illustrate the following w.r.t DNS** **08**

- a) Resolution
- b) DNS messages
- c) Types of Records

**OR**

Explain in detail the role of message transfer agent in an electronic mail system?

**Q.7 Attempt any two** **08**

- a) E-mail architecture
- b) Escape Character and Mode of Operation
- c) DNS Messages

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The values GET, POST, HEAD are specified in \_\_\_\_\_ of HTTP message.
  - a) Header line
  - b) Request line
  - c) Status line
  - d) Entity body
- 2) When the mail server sends mail to other mail servers it becomes \_\_\_\_\_.
  - a) SMTP server
  - b) Peer
  - c) SMTP client
  - d) Master
- 3) The entire hostname has a maximum of \_\_\_\_\_.
  - a) 127 characters
  - b) 255 characters
  - c) 63 characters
  - d) 31 characters
- 4) Which amongst the following statements is correct for "character at a time" mode?
  - a) Character processing is done on the local system under the control of the remote system
  - b) All text is processed locally, and only confirmed lines are sent to the remote host
  - c) All text is echoed locally, only completed lines are sent to the remote host
  - d) Most text typed is immediately sent to the remote host for processing
- 5) Which one of the following is not true?
  - a) Client can transfer files using to remote server using NVT
  - b) Client programs interact with NVT
  - c) Server translates NVT operations
  - d) Telnet defines a network virtual terminal (NVT) standard



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any three.** **12**

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**Q.3 Justify the following w.r.t. SCTP?** **08**

- a) Services
- b) Features
- c) Packet format

**OR**

Identify and illustrate all the socket system calls in socket interface?

**Q.4 Attempt any two** **08**

- a) User Datagram
- b) Special addresses
- c) Concurrency in Servers

**Section – II**

**Q.5 Attempt any three:** **12**

- a) Illustrate the message access agent w.r.t SMTP?
- b) Explain with figure the packet format of SSH?
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**Q.7 Attempt any two** **08**

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which amongst the following statements is correct for "character at a time" mode?
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- 2) Which one of the following is not true?
  - a) Client can transfer files using to remote server using NVT
  - b) Client programs interact with NVT
  - c) Server translates NVT operations
  - d) Telnet defines a network virtual terminal (NVT) standard
- 3) Which of the following is true for character mode operation of telnet implementation?
  - a) Each character typed is aggregated into a word and then sent to the server
  - b) Each character typed is discarded by the server
  - c) Each character typed is sent by the client to the server
  - d) Each character type is aggregated into a line and then sent to the server
- 4) The technique in which a congested node stops receiving data from the immediate upstream node or nodes is called as \_\_\_\_\_.
  - a) Backpressure
  - b) Admission policy
  - c) Forward signalling
  - d) Backward signalling
- 5) Transmission control protocol \_\_\_\_\_.
  - a) is a connection-oriented protocol
  - b) uses a three way handshake to establish a connection
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- 6) Transport layer protocols deals with \_\_\_\_\_.  
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c) TCP  
d) SCTP
- 9) If 5 files are transferred from server A to client B in the same session. The number of TCP connection between A and B is \_\_\_\_\_.  
a) 6  
b) 3  
c) 9  
d) 5
- 10) Mode of data transfer in FTP, where all these left to TCP:  
a) Compressed mode  
b) Block mode  
c) Stream mode  
d) None of these
- 11) The DHCP server \_\_\_\_\_.  
a) Maintains a database of available IP addresses  
b) Maintains the information about client configuration parameters  
c) Grants a IP address when receives a request from a client  
d) All of these
- 12) The values GET, POST, HEAD are specified in \_\_\_\_\_ of HTTP message.  
a) Header line  
b) Request line  
c) Status line  
d) Entity body
- 13) When the mail server sends mail to other mail servers it becomes \_\_\_\_\_.  
a) SMTP server  
b) Peer  
c) SMTP client  
d) Master
- 14) The entire hostname has a maximum of \_\_\_\_\_.  
a) 127 characters  
b) 255 characters  
c) 63 characters  
d) 31 characters

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| Set | R |
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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) State and illustrate the different levels of network addressing?
- b) Extend with figure the client server paradigm?
- c) Summarize the fragmentation w.r.t. IP protocol?
- d) Explain in detail the congestion control in TCP?

**Q.3 Justify the following w.r.t. SCTP?** **08**

- a) Services
- b) Features
- c) Packet format

**OR**

Identify and illustrate all the socket system calls in socket interface?

**Q.4 Attempt any two** **08**

- a) User Datagram
- b) Special addresses
- c) Concurrency in Servers

**Section – II**

**Q.5 Attempt any three:** **12**

- a) Illustrate the message access agent w.r.t SMTP?
- b) Explain with figure the packet format of SSH?
- c) Extend the DHCP protocol with its transition state?
- d) Identify and illustrate the options and option negotiation from TELNET?

**Q.6 Illustrate the following w.r.t DNS** **08**

- a) Resolution
- b) DNS messages
- c) Types of Records

**OR**

Explain in detail the role of message transfer agent in an electronic mail system?

**Q.7 Attempt any two** **08**

- a) E-mail architecture
- b) Escape Character and Mode of Operation
- c) DNS Messages



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**Set S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Mode of data transfer in FTP, where all these left to TCP:  
a) Compressed mode                      b) Block mode  
c) Stream mode                              d) None of these
- 2) The DHCP server \_\_\_\_\_.  
a) Maintains a database of available IP addresses  
b) Maintains the information about client configuration parameters  
c) Grants a IP address when receives a request from a client  
d) All of these
- 3) The values GET, POST, HEAD are specified in \_\_\_\_\_ of HTTP message.  
a) Header line                                  b) Request line  
c) Status line                                   d) Entity body
- 4) When the mail server sends mail to other mail servers it becomes \_\_\_\_\_.  
a) SMTP server                                b) Peer  
c) SMTP client                                  d) Master
- 5) The entire hostname has a maximum of \_\_\_\_\_.  
a) 127 characters                              b) 255 characters  
c) 63 characters                                 d) 31 characters
- 6) Which amongst the following statements is correct for "character at a time" mode?  
a) Character processing is done on the local system under the control of the remote system  
b) All text is processed locally, and only confirmed lines are sent to the remote host  
c) All text is echoed locally, only completed lines are sent to the remote host  
d) Most text typed is immediately sent to the remote host for processing

- Page 11 of 12

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| Set | S |
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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY**  
**Computer Networks**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.** **12**

- a) State and illustrate the different levels of network addressing?
- b) Extend with figure the client server paradigm?
- c) Summarize the fragmentation w.r.t. IP protocol?
- d) Explain in detail the congestion control in TCP?

**Q.3 Justify the following w.r.t. SCTP?** **08**

- a) Services
- b) Features
- c) Packet format

**OR**

Identify and illustrate all the socket system calls in socket interface?

**Q.4 Attempt any two** **08**

- a) User Datagram
- b) Special addresses
- c) Concurrency in Servers

**Section – II**

**Q.5 Attempt any three:** **12**

- a) Illustrate the message access agent w.r.t SMTP?
- b) Explain with figure the packet format of SSH?
- c) Extend the DHCP protocol with its transition state?
- d) Identify and illustrate the options and option negotiation from TELNET?

**Q.6 Illustrate the following w.r.t DNS** **08**

- a) Resolution
- b) DNS messages
- c) Types of Records

**OR**

Explain in detail the role of message transfer agent in an electronic mail system?

**Q.7 Attempt any two** **08**

- a) E-mail architecture
- b) Escape Character and Mode of Operation
- c) DNS Messages

|                 |  |
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| <b>Seat No.</b> |  |
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- 7) Match the following and choose the correct option
- | Rule                       | No. of subintervals |
|----------------------------|---------------------|
| 1) Simpson's (1/3) rd rule | p) Any              |
| 2) Simpson's (3/8) th rule | q) Multiple of 6    |
| 3) Weddle's rule           | r) Multiple of 3    |
|                            | s) Multiple of 2    |
- a)  $1 - p, 2 - q, 3 - s$       b)  $1 - r, 2 - s, 3 - q$   
 c)  $1 - s, 2 - p, 3 - s$       d)  $1 - s, 2 - r, 3 - q$
- 8) While solving an assignment problem an activity is assigned to a resource with zero opportunity cost the objective is to \_\_\_\_\_.  
 a) Reduce the cost of assignment to zero  
 b) Minimize total cost of an assignment  
 c) Reduce the cost of that particular assignment to minimum  
 d) none
- 9) Let  $A, B \in F(x)$  then A is said to be subset of B if for all  $x \in X$  \_\_\_\_\_.  
 a)  $A(x) \geq B(x)$       b)  $A(x) \leq B(x)$   
 c)  $A(x) > B(x)$       d) None
- 10) If A is a fuzzy set defined on  $X = [2, 4]$  by  $A(x) = \frac{x-2}{2}$  then  $\alpha_A =$  \_\_\_\_\_.  
 a)  $[2, 4]$       b)  $[2\alpha + 2, 4]$   
 c) Both a and b      d) None
- 11) For the maximization LPP the simplex method is terminated when all the net evaluations are \_\_\_\_\_.  
 a) Negative      b) Non-negative  
 c) Zero      d) All of the above
- 12) A is a fuzzy set,  $A(x) = \bar{A}(x), x \in X$  then x is \_\_\_\_\_.  
 a) special point      b) middle point  
 c) equilibrium point      d) point of intersection
- 13) For fuzzy sets A, B  $|A| = 3$   $|B| = 10$ ,  $|A \cap B| = 0.9$  then  $S(A, B) =$  \_\_\_\_\_.  
 a) 0.09      b) 0.9  
 c) 0.3      d) 0.99
- 14) Which of the following is not a fuzzy number?  
 a)  $A + B$       b)  $A - B$   
 c)  $\text{MIN}(A, B)$       d) None

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| Set | P |
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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.**

**09**

- Find the Positive root of the equation  $x^3 - \log_{10} x - 12 = 0$  correct up to three decimal places by using False Position method.
- Solve the system of equations by using Gauss Elimination method.  
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$
- Find the value of  $\sqrt{24}$  by using Newton Raphson method. Correct up to four decimal places.
- State the Trapezoidal Rule and evaluate  $\int_0^6 \frac{1}{1+x^2} dx$
- Find first three approximations by using Gauss Jacobi method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = 3$

**Q.3 Attempt any three of the following.**

**09**

- Apply Gaussian Quadrature 2-point formula to evaluate  $\int_{-2}^2 e^{-x/2} dx$
- Discover the double root of the equation  $x^3 - 5x^2 + 8x - 4 = 0$ . Which is near to 1.8 by using Newton Raphson method.
- Find first five approximations of the Eigen values of the given matrix by using Power method  $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$
- Apply Simpson's three-eighth rule to evaluate  $\int_{0.2}^{1.4} (\sin x - \log x + e^x) dx$  by take  $h = 0.2$ .
- Solve the system of equations by using Gauss Jordan method  
 $2x - 3y - z = 5, 4x + 4y - 3z = 3, 2x - 3y + 2z = 2$

**Q.4 Attempt any two of the following.**

**10**

- Solve the system of equations by using L. U. Decomposition method  
 $2x + 3y + z = 9, x + 2y + 3z = 6, 3x + y + 2z = 8$
- Solve the system of non-linear equations  $x^2 + y = 11, y^2 + x = 7$  take initial approximations as  $x_0 = 3.5$  and  $y_0 = -1.8$
- Apply Romberg integration method to evaluate  $\int_0^{0.5} \frac{x}{\sin x} dx$

## Section – II

**Q.5 Attempt any three of the following.**

09

- a) Define membership function and fuzzy set  
 b) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find  $(A \cup B)'$ ,  $A \cup B'$ 

- c) Evaluate the following

- i)  $[1,3] + [5,8]$   
 ii)  $[1,3] - [5,8]$   
 iii)  $[1,3] \cdot [5,8]$   
 iv)  $[1,3]/[5,8]$

- d) Find the equilibrium point for  $C(x) = \frac{x}{x+1}$   
 e) Find I.B.F.S by using Hungarian method

| Warehouse<br>Factory | I  | II | III | IV |
|----------------------|----|----|-----|----|
| A                    | 15 | 14 | 12  | 16 |
| B                    | 23 | 22 | 25  | 24 |
| C                    | 31 | 34 | 32  | 33 |
| D                    | 21 | 32 | 44  | 53 |

**Q.6 Attempt any three of the following.**

09

- a) Determine whether the following fuzzy set is a fuzzy number

$$C(x) = x \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{otherwise}$$

- b) Prove that  $\alpha_{+(A \cap B)} = \alpha_{+A} \cap \alpha_{+B}$

- c) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find fuzzy set  $0.4_{A \cap B}$ 

- d) Solve the Assignment Problem

| Tasks | E  | F  | G  | H  |
|-------|----|----|----|----|
| A     | 18 | 26 | 17 | 11 |
| B     | 13 | 28 | 14 | 26 |
| C     | 38 | 19 | 18 | 15 |
| D     | 19 | 26 | 24 | 10 |

- e) Maximize  $Z = 3x_1 + 2x_2$ , subject to

$$x_1 + x_2 \leq 4, \quad x_1 - x_2 \leq 2, \quad x_1, x_2 \geq 0$$

**Q.7 Attempt any two**

- a)**
- State first decomposition theorem and find
- $f(A)$
- where

$$A(x) = \frac{0.7}{-5} + \frac{0.6}{-4} + \frac{1}{-3} + \frac{0.4}{-2} + \frac{0.45}{-1} + \frac{0.75}{0} + \frac{0.81}{1} + \frac{0.34}{2} + \frac{1}{3} + \frac{0.17}{4} + \frac{0.91}{5}$$

$$X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$F: x \rightarrow y \text{ defined by } f(x) = x^2$$

- b)**
- Find
- $A + B$
- for the following membership function:

$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$

$$= \frac{3-x}{2} \quad 1 < x < 3$$

$$= 0 \quad \text{otherwise}$$

$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$

$$= \frac{5-x}{2} \quad 3 < x \leq 5$$

$$= 0 \quad \text{otherwise}$$

- c)**
- Solve the Assignment Problem

Machine

| Job | A  | B  | C  | D  |
|-----|----|----|----|----|
| 1   | 18 | 24 | 28 | 32 |
| 2   | 8  | 13 | 17 | 19 |
| 3   | 10 | 15 | 19 | 22 |



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) While solving an assignment problem an activity is assigned to a resource with zero opportunity cost the objective is to \_\_\_\_\_.  
 a) Reduce the cost of assignment to zero  
 b) Minimize total cost of an assignment  
 c) Reduce the cost of that particular assignment to minimum  
 d) none
- 2) Let  $A, B \in F(X)$  then A is said to be subset of B if for all  $x \in X$  \_\_\_\_\_.  
 a)  $A(x) \geq B(x)$   
 b)  $A(x) \leq B(x)$   
 c)  $A(x) > B(x)$   
 d) None
- 3) If A is a fuzzy set defined on  $X = [2,4]$  by  $A(x) = \frac{x-2}{2}$  then  $\alpha_A =$  \_\_\_\_\_.  
 a)  $[2,4]$   
 b)  $[2\alpha + 2,4]$   
 c) Both a and b  
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- 4) For the maximization LPP the simplex method is terminated when all the net evaluations are \_\_\_\_\_.  
 a) Negative  
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 c) Zero  
 d) All of the above
- 5) A is a fuzzy set,  $A(x) = \bar{A}(x), x \in X$  then x is \_\_\_\_\_.  
 a) special point  
 b) middle point  
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 d) point of intersection
- 6) For fuzzy sets A, B  $|A| = 3$   $|B| = 10$ ,  $|A \cap B| = 0.9$  then  $S(A, B) =$  \_\_\_\_\_.  
 a) 0.09  
 b) 0.9  
 c) 0.3  
 d) 0.99
- 7) Which of the following is not a fuzzy number?  
 a)  $A + B$   
 b)  $A - B$   
 c)  $\text{MIN}(A, B)$   
 d) None



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I**

**Q.2 Attempt any three of the following.**

**09**

- Find the Positive root of the equation  $x^3 - \log_{10} x - 12 = 0$  correct up to three decimal places by using False Position method.
- Solve the system of equations by using Gauss Elimination method.  
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$
- Find the value of  $\sqrt{24}$  by using Newton Raphson method. Correct up to four decimal places.
- State the Trapezoidal Rule and evaluate  $\int_0^6 \frac{1}{1+x^2} dx$
- Find first three approximations by using Gauss Jacobi method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = 3$

**Q.3 Attempt any three of the following.**

**09**

- Apply Gaussian Quadrature 2-point formula to evaluate  $\int_{-2}^2 e^{-x/2} dx$
- Discover the double root of the equation  $x^3 - 5x^2 + 8x - 4 = 0$ . Which is near to 1.8 by using Newton Raphson method.
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**Q.4 Attempt any two of the following.**

**10**

- Solve the system of equations by using L. U. Decomposition method  
 $2x + 3y + z = 9, x + 2y + 3z = 6, 3x + y + 2z = 8$
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- Apply Romberg integration method to evaluate  $\int_0^{0.5} \frac{x}{\sin x} dx$

## Section – II

**Q.5 Attempt any three of the following.**

09

- a) Define membership function and fuzzy set  
 b) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
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Then find  $(A \cup B)'$ ,  $A \cup B'$ 

- c) Evaluate the following

- i)  $[1,3] + [5,8]$   
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 iii)  $[1,3] \cdot [5,8]$   
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- d) Find the equilibrium point for  $C(x) = \frac{x}{x+1}$   
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| Warehouse<br>Factory | I  | II | III | IV |
|----------------------|----|----|-----|----|
| A                    | 15 | 14 | 12  | 16 |
| B                    | 23 | 22 | 25  | 24 |
| C                    | 31 | 34 | 32  | 33 |
| D                    | 21 | 32 | 44  | 53 |

**Q.6 Attempt any three of the following.**

09

- a) Determine whether the following fuzzy set is a fuzzy number

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$$= 0 \quad \text{otherwise}$$

- b) Prove that  $\alpha_{+(A \cap B)} = \alpha_{+A} \cap \alpha_{+B}$

- c) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find fuzzy set  $0.4_{A \cap B}$ 

- d) Solve the Assignment Problem

| Tasks | E  | F  | G  | H  |
|-------|----|----|----|----|
| A     | 18 | 26 | 17 | 11 |
| B     | 13 | 28 | 14 | 26 |
| C     | 38 | 19 | 18 | 15 |
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- e) Maximize  $Z = 3x_1 + 2x_2$ , subject to

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**Q.7 Attempt any two**

- a)**
- State first decomposition theorem and find
- $f(A)$
- where

$$A(x) = \frac{0.7}{-5} + \frac{0.6}{-4} + \frac{1}{-3} + \frac{0.4}{-2} + \frac{0.45}{-1} + \frac{0.75}{0} + \frac{0.81}{1} + \frac{0.34}{2} + \frac{1}{3} + \frac{0.17}{4} + \frac{0.91}{5}$$

$$X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$F: x \rightarrow y \text{ defined by } f(x) = x^2$$

- b)**
- Find
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$$= \frac{5-x}{2} \quad 3 < x \leq 5$$

$$= 0 \quad \text{otherwise}$$

- c)**
- Solve the Assignment Problem

Machine

| Job | A  | B  | C  | D  |
|-----|----|----|----|----|
| 1   | 18 | 24 | 28 | 32 |
| 2   | 8  | 13 | 17 | 19 |
| 3   | 10 | 15 | 19 | 22 |

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| Seat No. |  |
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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) For the maximization LPP the simplex method is terminated when all the net evaluations are \_\_\_\_\_.
  - a) Negative
  - b) Non-negative
  - c) Zero
  - d) All of the above
- 2)  $A$  is a fuzzy set,  $A(x) = \bar{A}(x), x \in X$  then  $x$  is \_\_\_\_\_.
  - a) special point
  - b) middle point
  - c) equilibrium point
  - d) point of intersection
- 3) For fuzzy sets  $A, B$   $|A| = 3$   $|B| = 10, |A \cap B| = 0.9$  then  $S(A, B) =$  \_\_\_\_\_.
  - a) 0.09
  - b) 0.9
  - c) 0.3
  - d) 0.99
- 4) Which of the following is not a fuzzy number?
  - a)  $A + B$
  - b)  $A - B$
  - c)  $\text{MIN}(A, B)$
  - d) None
- 5) The interval in which a real root of the equation  $x^3 - 2x - 5 = 0$  lies is \_\_\_\_\_.
  - a) (1,2)
  - b) (0,1)
  - c) (2,3)
  - d) (3,4)
- 6) The formula used for solving the equation using Regula Falsi method is
  - i)  $x = \frac{bf(a) - af(b)}{f(a) - f(b)}$
  - ii)  $x = \frac{af(b) - bf(a)}{f(a) - f(b)}$
  - a) Only i is Correct
  - b) Only ii is Correct
  - c) Both i, ii are Correct
  - d) Both i, ii are Incorrect
- 7) The coefficient matrix is transformed to \_\_\_\_\_ form in Gauss Elimination method.
  - a) Diagonal
  - b) Upper triangular
  - c) Lower triangular
  - d) None of a, b, c

- 8) Which of the following is not direct method?  
 a) Gauss – Elimination                      b) Gauss – Jordan  
 c) Gauss – Seidal                              d) Crout's method
- 9) To apply Simpson's one-third rule the number of sub-intervals must be \_\_\_\_\_.  
 a) Even                                              b) Odd  
 c) Multiple of 3                                  d) Multiple of 6
- 10) Which of the following is false?  
 a) Error in Trapezoidal rule is of order  $h^2$   
 b) Error in Weddle's rule is of order  $h^7$   
 c) Error in Simpson's  $3/8^{\text{th}}$  rule is of order  $h^5$   
 d) Error in Simpson's  $1/3^{\text{rd}}$  rule is of order  $h$
- 11) Match the following and choose the correct option
- | Rule                       | No. of subintervals    |
|----------------------------|------------------------|
| 1) Simpson's (1/3) rd rule | p) Any                 |
| 2) Simpson's (3/8) th rule | q) Multiple of 6       |
| 3) Weddle's rule           | r) Multiple of 3       |
|                            | s) Multiple of 2       |
| a) 1 – p, 2 – q, 3 – s     | b) 1 – r, 2 – s, 3 – q |
| c) 1 – s, 2 – p, 3 – s     | d) 1 – s, 2 – r, 3 – q |
- 12) While solving an assignment problem an activity is assigned to a resource with zero opportunity cost the objective is to \_\_\_\_\_.  
 a) Reduce the cost of assignment to zero  
 b) Minimize total cost of an assignment  
 c) Reduce the cost of that particular assignment to minimum  
 d) none
- 13) Let  $A, B \in F(X)$  then A is said to be subset of B if for all  $x \in X$  \_\_\_\_\_.  
 a)  $A(x) \geq B(x)$                                   b)  $A(x) \leq B(x)$   
 c)  $A(x) > B(x)$                                   d) None
- 14) If A is a fuzzy set defined on  $X = [2,4]$  by  $A(x) = \frac{x-2}{2}$  then  $\alpha_A =$  \_\_\_\_\_.  
 a)  $[2,4]$                                               b)  $[2\alpha + 2,4)$   
 c) Both a and b                                      d) None

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Set **R**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.**

**09**

- Find the Positive root of the equation  $x^3 - \log_{10} x - 12 = 0$  correct up to three decimal places by using False Position method.
- Solve the system of equations by using Gauss Elimination method.  
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$
- Find the value of  $\sqrt{24}$  by using Newton Raphson method. Correct up to four decimal places.
- State the Trapezoidal Rule and evaluate  $\int_0^6 \frac{1}{1+x^2} dx$
- Find first three approximations by using Gauss Jacobi method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = 3$

**Q.3 Attempt any three of the following.**

**09**

- Apply Gaussian Quadrature 2-point formula to evaluate  $\int_{-2}^2 e^{-x/2} dx$
- Discover the double root of the equation  $x^3 - 5x^2 + 8x - 4 = 0$ . Which is near to 1.8 by using Newton Raphson method.
- Find first five approximations of the Eigen values of the given matrix by using Power method  $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$
- Apply Simpson's three-eighth rule to evaluate  $\int_{0.2}^{1.4} (\sin x - \log x + e^x) dx$  by take  $h = 0.2$ .
- Solve the system of equations by using Gauss Jordan method  
 $2x - 3y - z = 5, 4x + 4y - 3z = 3, 2x - 3y + 2z = 2$

**Q.4 Attempt any two of the following.**

**10**

- Solve the system of equations by using L. U. Decomposition method  
 $2x + 3y + z = 9, x + 2y + 3z = 6, 3x + y + 2z = 8$
- Solve the system of non-linear equations  $x^2 + y = 11, y^2 + x = 7$  take initial approximations as  $x_0 = 3.5$  and  $y_0 = -1.8$
- Apply Romberg integration method to evaluate  $\int_0^{0.5} \frac{x}{\sin x} dx$



## Section – II

**Q.5 Attempt any three of the following.**

09

- a) Define membership function and fuzzy set  
 b) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find  $(A \cup B)'$ ,  $A \cup B'$ 

- c) Evaluate the following

- i)  $[1,3] + [5,8]$   
 ii)  $[1,3] - [5,8]$   
 iii)  $[1,3] \cdot [5,8]$   
 iv)  $[1,3]/[5,8]$

- d) Find the equilibrium point for  $C(x) = \frac{x}{x+1}$   
 e) Find I.B.F.S by using Hungarian method

| Warehouse<br>Factory | I  | II | III | IV |
|----------------------|----|----|-----|----|
| A                    | 15 | 14 | 12  | 16 |
| B                    | 23 | 22 | 25  | 24 |
| C                    | 31 | 34 | 32  | 33 |
| D                    | 21 | 32 | 44  | 53 |

**Q.6 Attempt any three of the following.**

09

- a) Determine whether the following fuzzy set is a fuzzy number

$$C(x) = x \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{otherwise}$$

- b) Prove that  $\alpha_{+(A \cap B)} = \alpha_{+A} \cap \alpha_{+B}$

- c) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find fuzzy set  $0.4_{A \cap B}$ 

- d) Solve the Assignment Problem

| Tasks | E  | F  | G  | H  |
|-------|----|----|----|----|
| A     | 18 | 26 | 17 | 11 |
| B     | 13 | 28 | 14 | 26 |
| C     | 38 | 19 | 18 | 15 |
| D     | 19 | 26 | 24 | 10 |

- e) Maximize  $Z = 3x_1 + 2x_2$ , subject to

$$x_1 + x_2 \leq 4, \quad x_1 - x_2 \leq 2, \quad x_1, x_2 \geq 0$$

**Q.7 Attempt any two**

- a)**
- State first decomposition theorem and find
- $f(A)$
- where

$$A(x) = \frac{0.7}{-5} + \frac{0.6}{-4} + \frac{1}{-3} + \frac{0.4}{-2} + \frac{0.45}{-1} + \frac{0.75}{0} + \frac{0.81}{1} + \frac{0.34}{2} + \frac{1}{3} + \frac{0.17}{4} + \frac{0.91}{5}$$

$$X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$F: x \rightarrow y \text{ defined by } f(x) = x^2$$

- b)**
- Find
- $A + B$
- for the following membership function:

$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$

$$= \frac{3-x}{2} \quad 1 < x < 3$$

$$= 0 \quad \text{otherwise}$$

$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$

$$= \frac{5-x}{2} \quad 3 < x \leq 5$$

$$= 0 \quad \text{otherwise}$$

- c)**
- Solve the Assignment Problem

Machine

| Job | A  | B  | C  | D  |
|-----|----|----|----|----|
| 1   | 18 | 24 | 28 | 32 |
| 2   | 8  | 13 | 17 | 19 |
| 3   | 10 | 15 | 19 | 22 |

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Set **S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is false?
  - a) Error in Trapezoidal rule is of order  $h^2$
  - b) Error in Weddle's rule is of order  $h^7$
  - c) Error in Simpson's  $3/8^{\text{th}}$  rule is of order  $h^5$
  - d) Error in Simpson's  $1/3^{\text{rd}}$  rule is of order  $h$
- 2) Match the following and choose the correct option
 

| Rule                                  | No. of subintervals |
|---------------------------------------|---------------------|
| 1) Simpson's $(1/3)^{\text{rd}}$ rule | p) Any              |
| 2) Simpson's $(3/8)^{\text{th}}$ rule | q) Multiple of 6    |
| 3) Weddle's rule                      | r) Multiple of 3    |
|                                       | s) Multiple of 2    |

  - a) 1 – p, 2 – q, 3 – s
  - b) 1 – r, 2 – s, 3 – q
  - c) 1 – s, 2 – p, 3 – s
  - d) 1 – s, 2 – r, 3 – q
- 3) While solving an assignment problem an activity is assigned to a resource with zero opportunity cost the objective is to \_\_\_\_\_.
  - a) Reduce the cost of assignment to zero
  - b) Minimize total cost of an assignment
  - c) Reduce the cost of that particular assignment to minimum
  - d) none
- 4) Let  $A, B \in F(X)$  then A is said to be subset of B if for all  $x \in X$  \_\_\_\_\_.
  - a)  $A(x) \geq B(x)$
  - b)  $A(x) \leq B(x)$
  - c)  $A(x) > B(x)$
  - d) None
- 5) If A is a fuzzy set defined on  $X = [2, 4]$  by  $A(x) = \frac{x-2}{2}$  then  $\alpha_A =$  \_\_\_\_\_.
  - a)  $[2, 4]$
  - b)  $[2\alpha + 2, 4]$
  - c) Both a and b
  - d) None

- Page 17 of 20

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Set **S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics – II**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.**

**09**

- Find the Positive root of the equation  $x^3 - \log_{10} x - 12 = 0$  correct up to three decimal places by using False Position method.
- Solve the system of equations by using Gauss Elimination method.  
 $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$
- Find the value of  $\sqrt{24}$  by using Newton Raphson method. Correct up to four decimal places.
- State the Trapezoidal Rule and evaluate  $\int_0^6 \frac{1}{1+x^2} dx$
- Find first three approximations by using Gauss Jacobi method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = 3$

**Q.3 Attempt any three of the following.**

**09**

- Apply Gaussian Quadrature 2-point formula to evaluate  $\int_{-2}^2 e^{-x/2} dx$
- Discover the double root of the equation  $x^3 - 5x^2 + 8x - 4 = 0$ . Which is near to 1.8 by using Newton Raphson method.
- Find first five approximations of the Eigen values of the given matrix by using Power method  $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$
- Apply Simpson's three-eighth rule to evaluate  $\int_{0.2}^{1.4} (\sin x - \log x + e^x) dx$  by take  $h = 0.2$ .
- Solve the system of equations by using Gauss Jordan method  
 $2x - 3y - z = 5, 4x + 4y - 3z = 3, 2x - 3y + 2z = 2$

**Q.4 Attempt any two of the following.**

**10**

- Solve the system of equations by using L. U. Decomposition method  
 $2x + 3y + z = 9, x + 2y + 3z = 6, 3x + y + 2z = 8$
- Solve the system of non-linear equations  $x^2 + y = 11, y^2 + x = 7$  take initial approximations as  $x_0 = 3.5$  and  $y_0 = -1.8$
- Apply Romberg integration method to evaluate  $\int_0^{0.5} \frac{x}{\sin x} dx$

## Section – II

**Q.5 Attempt any three of the following.**

09

- a) Define membership function and fuzzy set  
 b) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find  $(A \cup B)'$ ,  $A \cup B'$ 

- c) Evaluate the following

- i)  $[1,3] + [5,8]$   
 ii)  $[1,3] - [5,8]$   
 iii)  $[1,3] \cdot [5,8]$   
 iv)  $[1,3]/[5,8]$

- d) Find the equilibrium point for  $C(x) = \frac{x}{x+1}$   
 e) Find I.B.F.S by using Hungarian method

| Warehouse<br>Factory | I  | II | III | IV |
|----------------------|----|----|-----|----|
| A                    | 15 | 14 | 12  | 16 |
| B                    | 23 | 22 | 25  | 24 |
| C                    | 31 | 34 | 32  | 33 |
| D                    | 21 | 32 | 44  | 53 |

**Q.6 Attempt any three of the following.**

09

- a) Determine whether the following fuzzy set is a fuzzy number

$$C(x) = x \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{otherwise}$$

- b) Prove that  $\alpha_{+(A \cap B)} = \alpha_{+A} \cap \alpha_{+B}$

- c) For the fuzzy sets

|           |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|
| Elements: | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ |
| A(x):     | 0.1   | 0.6   | 0.8   | 0.9   | 0.7   | 0.1   |
| B(x):     | 0.9   | 0.7   | 0.5   | 0.2   | 0.1   | 0     |

Then find fuzzy set  $0.4_{A \cap B}$ 

- d) Solve the Assignment Problem

| Tasks | E  | F  | G  | H  |
|-------|----|----|----|----|
| A     | 18 | 26 | 17 | 11 |
| B     | 13 | 28 | 14 | 26 |
| C     | 38 | 19 | 18 | 15 |
| D     | 19 | 26 | 24 | 10 |

- e) Maximize  $Z = 3x_1 + 2x_2$ , subject to

$$x_1 + x_2 \leq 4, \quad x_1 - x_2 \leq 2, \quad x_1, x_2 \geq 0$$

**Q.7 Attempt any two**

- a)**
- State first decomposition theorem and find
- $f(A)$
- where

$$A(x) = \frac{0.7}{-5} + \frac{0.6}{-4} + \frac{1}{-3} + \frac{0.4}{-2} + \frac{0.45}{-1} + \frac{0.75}{0} + \frac{0.81}{1} + \frac{0.34}{2} + \frac{1}{3} + \frac{0.17}{4} + \frac{0.91}{5}$$

$$X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$F: x \rightarrow y \text{ defined by } f(x) = x^2$$

- b)**
- Find
- $A + B$
- for the following membership function:

$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$

$$= \frac{3-x}{2} \quad 1 < x < 3$$

$$= 0 \quad \text{otherwise}$$

$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$

$$= \frac{5-x}{2} \quad 3 < x \leq 5$$

$$= 0 \quad \text{otherwise}$$

- c)**
- Solve the Assignment Problem

Machine

| Job | A  | B  | C  | D  |
|-----|----|----|----|----|
| 1   | 18 | 24 | 28 | 32 |
| 2   | 8  | 13 | 17 | 19 |
| 3   | 10 | 15 | 19 | 22 |

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- 8) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.
- |                  |                |
|------------------|----------------|
| a) under fitting | b) overfitting |
| c) cost function | d) none        |
- 9) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text.
- |                |                                |
|----------------|--------------------------------|
| a) Data mining | b) Natural Language Processing |
| c) Statistics  | d) None                        |
- 10) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_\_.
- |                        |                   |
|------------------------|-------------------|
| a) mini-batch learning | b) learning model |
| c) linear regression   | d) None           |
- 11) \_\_\_\_\_ function performs the rendering and uses a grayscale color map.
- |               |             |
|---------------|-------------|
| a) plt.show() | b) show()   |
| c) imshow()   | d) imread() |
- 12) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
- |                  |                 |
|------------------|-----------------|
| a) connectionism | b) neuron       |
| c) deep learning | d) all of above |
- 13) \_\_\_\_\_ Model looks into the future analysis of data.
- |                |                  |
|----------------|------------------|
| a) Descriptive | b) Predictive    |
| c) Business    | d) None of above |
- 14) \_\_\_\_\_ method is used to avoid over fitting.
- |                                |                   |
|--------------------------------|-------------------|
| a) Bayesian                    | b) Regularization |
| c) Rule based machine learning | d) None           |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Make suitable assumptions (if necessary and state them clearly)  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**  
 a) Explain tying machine learning methods to outcome.  
 b) Define machine learning. Explain Lear verging the power of machine learning.  
 c) Write the differences between supervised and unsupervised learning.  
 d) Explain the application of machine learning.  
 e) Explain the term reinforcement learning.
- Q.3 Answer the following questions. (Any One) 06**  
 a) Explain learning as optimization.  
 b) How to determine the best learning model explain it?
- Q.4 What is cost function explain its different types? 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**  
 a) Write short note on Searching for the best hyper parameters.  
 b) Write a short note on applying feature engineering.  
 c) Explain the term variance.  
 d) Explain the descending error curve.  
 e) Explain the stacking model.
- Q.6 Answer the following questions. (Any One) 06**  
 a) Write short note on underfitting and overfitting.  
 b) Explain the discovering the Incredible perceptron.
- Q.7 Explain the use of cross validation. 06**

|                 |  |
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- 9) \_\_\_\_\_ is focused on primarily on making inferences and understanding the characteristics of the variable.
- a) Data mining
  - b) Statistics
  - c) Artificial Intelligence
  - d) All
- 10) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
- a) scipy
  - b) numpy
  - c) none
  - d) sklearn
- 11) \_\_\_\_\_ ways improves machine learning model.
- a) error curve method
  - b) testing multiple model
  - c) SDLC Model
  - d) none
- 12) \_\_\_\_\_ Technique is used to group similar types of objects with similar parameter.
- a) Bayesian
  - b) Clustering
  - c) Association
  - d) None
- 13) Which of the following steps are required to apply machine learning technique to support business strategy?
- a) What is the business problem you are trying to solve
  - b) When are the hidden data resources that you can take advantage
  - c) How can you prepare to get your data
  - d) all
- 14) No matter what the information is, for a machine learning algorithm to correctly process it, it should always be transformed into a \_\_\_\_\_.
- a) number
  - b) text
  - c) images
  - d) all of above

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Make suitable assumptions (if necessary and state them clearly)  
3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**  
a) Explain tying machine learning methods to outcome.  
b) Define machine learning. Explain Lear verging the power of machine learning.  
c) Write the differences between supervised and unsupervised learning.  
d) Explain the application of machine learning.  
e) Explain the term reinforcement learning.
- Q.3 Answer the following questions. (Any One) 06**  
a) Explain learning as optimization.  
b) How to determine the best learning model explain it?
- Q.4 What is cost function explain its different types? 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**  
a) Write short note on Searching for the best hyper parameters.  
b) Write a short note on applying feature engineering.  
c) Explain the term variance.  
d) Explain the descending error curve.  
e) Explain the stacking model.
- Q.6 Answer the following questions. (Any One) 06**  
a) Write short note on underfitting and overfitting.  
b) Explain the discovering the Incredible perceptron.
- Q.7 Explain the use of cross validation. 06**

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) \_\_\_\_\_ function performs the rendering and uses a grayscale color map.
  - a) plt.show()
  - b) show()
  - c) imshow()
  - d) imread()
- 2) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
  - a) connectionism
  - b) neuron
  - c) deep learning
  - d) all of above
- 3) \_\_\_\_\_ Model looks into the future analysis of data.
  - a) Descriptive
  - b) Predictive
  - c) Business
  - d) None of above
- 4) \_\_\_\_\_ method is used to avoid over fitting.
  - a) Bayesian
  - b) Regularization
  - c) Rule based machine learning
  - d) None
- 5) Quantitative features are perfect for machine learning because they define values as \_\_\_\_\_.
  - a) number
  - b) text
  - c) images
  - d) all of above
- 6) \_\_\_\_\_ is focused on primarily on making inferences and understanding the characteristics of the variable.
  - a) Data mining
  - b) Statistics
  - c) Artificial Intelligence
  - d) All
- 7) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.
  - a) scipy
  - b) numpy
  - c) none
  - d) sklearn
- 8) \_\_\_\_\_ ways improves machine learning model.
  - a) error curve method
  - b) testing multiple model
  - c) SDLC Model
  - d) none

- 9) \_\_\_\_\_ Technique is used to group similar types of objects with similar parameter.
- a) Bayesian
  - b) Clustering
  - c) Association
  - d) None
- 10) Which of the following steps are required to apply machine learning technique to support business strategy?
- a) What is the business problem you are trying to solve
  - b) When are the hidden data resources that you can take advantage
  - c) How can you prepare to get your data
  - d) all
- 11) No matter what the information is, for a machine learning algorithm to correctly process it, it should always be transformed into a \_\_\_\_\_.
- a) number
  - b) text
  - c) images
  - d) all of above
- 12) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.
- a) under fitting
  - b) overfitting
  - c) cost function
  - d) none
- 13) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text.
- a) Data mining
  - b) Natural Language Processing
  - c) Statistics
  - d) None
- 14) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_\_.
- a) mini-batch learning
  - b) learning model
  - c) linear regression
  - d) None

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Make suitable assumptions (if necessary and state them clearly)  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**  
 a) Explain tying machine learning methods to outcome.  
 b) Define machine learning. Explain Lear verging the power of machine learning.  
 c) Write the differences between supervised and unsupervised learning.  
 d) Explain the application of machine learning.  
 e) Explain the term reinforcement learning.
- Q.3 Answer the following questions. (Any One) 06**  
 a) Explain learning as optimization.  
 b) How to determine the best learning model explain it?
- Q.4 What is cost function explain its different types? 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**  
 a) Write short note on Searching for the best hyper parameters.  
 b) Write a short note on applying feature engineering.  
 c) Explain the term variance.  
 d) Explain the descending error curve.  
 e) Explain the stacking model.
- Q.6 Answer the following questions. (Any One) 06**  
 a) Write short note on underfitting and overfitting.  
 b) Explain the discovering the Incredible perceptron.
- Q.7 Explain the use of cross validation. 06**



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following steps are required to apply machine learning technique to support business strategy?
  - a) What is the business problem you are trying to solve
  - b) When are the hidden data resources that you can take advantage
  - c) How can you prepare to get your data
  - d) all
- 2) No matter what the information is, for a machine learning algorithm to correctly process it, it should always be transformed into a \_\_\_\_\_.
  - a) number
  - b) text
  - c) images
  - d) all of above
- 3) \_\_\_\_\_ occurs when your algorithm has learned too much from your data, up to the point of mapping curve shapes and rules that do not exist.
  - a) under fitting
  - b) overfitting
  - c) cost function
  - d) none
- 4) \_\_\_\_\_ is the ability to train computer to understand both human speech and written text.
  - a) Data mining
  - b) Natural Language Processing
  - c) Statistics
  - d) None
- 5) The process goes on repetitively until there are no more chunks. Chunks can be small (depending on core memory), and the process is called \_\_\_\_\_.
  - a) mini-batch learning
  - b) learning model
  - c) linear regression
  - d) None
- 6) \_\_\_\_\_ function performs the rendering and uses a grayscale color map.
  - a) plt.show()
  - b) show()
  - c) imshow()
  - d) imread()
- 7) \_\_\_\_\_ is the approach to machine learning that is based on neuroscience.
  - a) connectionism
  - b) neuron
  - c) deep learning
  - d) all of above

- 8) \_\_\_\_\_ Model looks into the future analysis of data.

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| a) Descriptive | b) Predictive    |
| c) Business    | d) None of above |
- 9) \_\_\_\_\_ method is used to avoid over fitting.

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| a) Bayesian                    | b) Regularization |
| c) Rule based machine learning | d) None           |
- 10) Quantitative features are perfect for machine learning because they define values as \_\_\_\_\_.

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| a) number | b) text         |
| c) images | d) all of above |
- 11) \_\_\_\_\_ is focused on primarily on making inferences and understanding the characteristics of the variable.

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| a) Data mining             | b) Statistics |
| c) Artificial Intelligence | d) All        |
- 12) In Python \_\_\_\_\_ package offers all the functionality needed to create and manipulate matrices.

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| a) scipy | b) numpy   |
| c) none  | d) sklearn |
- 13) \_\_\_\_\_ ways improves machine learning model.

|                       |                           |
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| a) error curve method | b) testing multiple model |
| c) SDLC Model         | d) none                   |
- 14) \_\_\_\_\_ Technique is used to group similar types of objects with similar parameter.

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| a) Bayesian    | b) Clustering |
| c) Association | d) None       |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Machine Learning**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Make suitable assumptions (if necessary and state them clearly)  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**  
 a) Explain tying machine learning methods to outcome.  
 b) Define machine learning. Explain Lear verging the power of machine learning.  
 c) Write the differences between supervised and unsupervised learning.  
 d) Explain the application of machine learning.  
 e) Explain the term reinforcement learning.
- Q.3 Answer the following questions. (Any One) 06**  
 a) Explain learning as optimization.  
 b) How to determine the best learning model explain it?
- Q.4 What is cost function explain its different types? 06**

**Section – II**

- Q.5 Answer the following questions. (Any Four) 16**  
 a) Write short note on Searching for the best hyper parameters.  
 b) Write a short note on applying feature engineering.  
 c) Explain the term variance.  
 d) Explain the descending error curve.  
 e) Explain the stacking model.
- Q.6 Answer the following questions. (Any One) 06**  
 a) Write short note on underfitting and overfitting.  
 b) Explain the discovering the Incredible perceptron.
- Q.7 Explain the use of cross validation. 06**

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Mathematics for Data Science**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no. 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Among the following, choose the correct application of data science in Healthcare.
  - a) Data science for genomics
  - b) Data science for medical imaging
  - c) Drug discovery with Data science
  - d) All of the above
- 2) What is the first step in linear algebra?
  - a) Let's complicate the problem
  - b) Solve the problem
  - c) Visualize the problem
  - d) None of the above
- 3) The concept of Eigen values and vectors is applicable to \_\_\_\_\_.
  - a) Scalar matrix
  - b) Identity matrix
  - c) Upper triangular matrix
  - d) Square matrix
- 4) Simpson's rule assumes that boundary between the ordinates are parabolic arcs.
  - a) True
  - b) False
- 5) Find the mode and median of the 9 consecutive number: 12, 7, 8, 14, 21, 23, 27, 7, 11
  - a) 12, 9
  - b) 7, 9
  - c) 7, 12
  - d) 11, 9
- 6) Which of the following is correct application for Eigenvectors?
  - a) Computer vision
  - b) Physics
  - c) Machine learning
  - d) All of the above
- 7) The correlation coefficient is \_\_\_\_\_.
  - a) The square of the coefficient of determination
  - b) Can never be negative
  - c) The square root of the coefficient of determination
  - d) The same as r square

- 8) Normal Distribution is applied for \_\_\_\_\_.  
a) Continuous Random Distribution  
b) Discrete Random Variable  
c) Irregular Random Variable  
d) Uncertain Random Variable
- 9) What does the central limit theorem state?  
a) if the sample size increases sampling distribution must approach normal distribution  
b) if the sample size decreases then the sample distribution must approach normal distribution  
c) if the sample size increases then the sampling distribution much approach an exponential distribution  
d) if the sample size decreases then the sampling distribution much approach an exponential distribution
- 10) The probability of rejecting a true hypothesis is called \_\_\_\_\_.  
a) Critical region  
b) Level of significance  
c) Test statistics  
d) Statement of hypothesis
- 11) A statistic on the basis of which a decision is made about the hypothesis of interest is called \_\_\_\_\_.  
a) Test statistics  
b) Significance level  
c) Statement of hypothesis  
d) Critical region
- 12) The parameter E which we use for least square method is called as \_\_\_\_\_.  
a) Sum of residues  
b) Residues  
c) Error  
d) Sum of errors
- 13) \_\_\_\_\_ processes all the training examples for each iteration of gradient descent.  
a) Stochastic Gradient Descent  
b) Batch Gradient Descent  
c) Mini Batch gradient descent  
d) None of the above
- 14) What is the full form of KKT?  
a) Kret Kuhn Tacker  
b) Karush Kuhn Tucker  
c) Karush Kuhn Tacker  
d) None of these

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Mathematics for Data Science**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Three) 12**
- What is Data Science?
  - Consider the ages of five employees as 30, 30, 32, 38, 60 years. Calculate the measures of central tendency.
  - Explain the term hyper planes and half-planes.
  - What is central tendencies?
- Q.3 Answer the following questions. (Any Two) 16**
- Explain Data Science Life Cycle.
  - Explain in detail Distance measures types in data science.
  - What are Eigen values & Eigenvectors?

**Section – II**

- Q.4 Answer the following questions. (Any Three) 12**
- The mean age of people in a colony is 34 years. Suppose the standard deviation is 15 years. The sample of size is 50. Find the mean and standard deviation of the sample.
  - What Is Hypothesis Testing in Statistics?
  - What is KKT condition? Explain in short.
  - What is the Least Squares Method?
- Q.5 Answer the following questions. (Any Two) 16**
- A fair die is rolled, Let A be the event that shows an outcome is an odd number, so  $A = \{1, 3, 5\}$ . Also, suppose B the event that shows the outcome is less than or equal to 3, so  $B = \{1, 2, 3\}$ . Then what is the probability of A,  $P(A)$ , and what is the probability A given B,  $P(A | B)$ ?
  - Explain in detail Statistical Hypothesis Testing. What is P-value?
  - What is gradient descent? How does gradient descent work? Explain with its types.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Mathematics for Data Science**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no. 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Normal Distribution is applied for \_\_\_\_\_.  
 a) Continuous Random Distribution  
 b) Discrete Random Variable  
 c) Irregular Random Variable  
 d) Uncertain Random Variable
- 2) What does the central limit theorem state?  
 a) if the sample size increases sampling distribution must approach normal distribution  
 b) if the sample size decreases then the sample distribution must approach normal distribution  
 c) if the sample size increases then the sampling distribution much approach an exponential distribution  
 d) if the sample size decreases then the sampling distribution much approach an exponential distribution
- 3) The probability of rejecting a true hypothesis is called \_\_\_\_\_.  
 a) Critical region  
 b) Level of significance  
 c) Test statistics  
 d) Statement of hypothesis
- 4) A statistic on the basis of which a decision is made about the hypothesis of interest is called \_\_\_\_\_.  
 a) Test statistics  
 b) Significance level  
 c) Statement of hypothesis  
 d) Critical region
- 5) The parameter E which we use for least square method is called as \_\_\_\_\_.  
 a) Sum of residues  
 b) Residues  
 c) Error  
 d) Sum of errors
- 6) \_\_\_\_\_ processes all the training examples for each iteration of gradient descent.  
 a) Stochastic Gradient Descent  
 b) Batch Gradient Descent  
 c) Mini Batch gradient descent  
 d) None of the above

- 7) What is the full form of KKT?  
a) Kret Kuhn Tacker                      b) Karush Kuhn Tucker  
c) Karush Kuhn Tacker                  d) None of these
- 8) Among the following, choose the correct application of data science in Healthcare.  
a) Data science for genomics  
b) Data science for medical imaging  
c) Drug discovery with Data science  
d) All of the above
- 9) What is the first step in linear algebra?  
a) Let's complicate the problem      b) Solve the problem  
c) Visualize the problem                d) None of the above
- 10) The concept of Eigen values and vectors is applicable to \_\_\_\_\_.  
a) Scalar matrix                          b) Identity matrix  
c) Upper triangular matrix              d) Square matrix
- 11) Simpson's rule assumes that boundary between the ordinates are parabolic arcs.  
a) True                                        b) False
- 12) Find the mode and median of the 9 consecutive number:  
12, 7, 8, 14, 21, 23, 27, 7, 11  
a) 12, 9                                      b) 7, 9  
c) 7, 12                                        d) 11, 9
- 13) Which of the following is correct application for Eigenvectors?  
a) Computer vision                        b) Physics  
c) Machine learning                        d) All of the above
- 14) The correlation coefficient is \_\_\_\_\_.  
a) The square of the coefficient of determination  
b) Can never be negative  
c) The square root of the coefficient of determination  
d) The same as r square



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Mathematics for Data Science**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Three) 12**
- What is Data Science?
  - Consider the ages of five employees as 30, 30, 32, 38, 60 years. Calculate the measures of central tendency.
  - Explain the term hyper planes and half-planes.
  - What is central tendencies?
- Q.3 Answer the following questions. (Any Two) 16**
- Explain Data Science Life Cycle.
  - Explain in detail Distance measures types in data science.
  - What are Eigen values & Eigenvectors?

**Section – II**

- Q.4 Answer the following questions. (Any Three) 12**
- The mean age of people in a colony is 34 years. Suppose the standard deviation is 15 years. The sample of size is 50. Find the mean and standard deviation of the sample.
  - What Is Hypothesis Testing in Statistics?
  - What is KKT condition? Explain in short.
  - What is the Least Squares Method?
- Q.5 Answer the following questions. (Any Two) 16**
- A fair die is rolled, Let A be the event that shows an outcome is an odd number, so  $A = \{1, 3, 5\}$ . Also, suppose B the event that shows the outcome is less than or equal to 3, so  $B = \{1, 2, 3\}$ . Then what is the probability of A,  $P(A)$ , and what is the probability A given B,  $P(A | B)$ ?
  - Explain in detail Statistical Hypothesis Testing. What is P-value?
  - What is gradient descent? How does gradient descent work? Explain with its types.

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no. 03 (Starting page of the Answer Book). Each Question carries one mark.  
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### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) A statistic on the basis of which a decision is made about the hypothesis of interest is called \_\_\_\_\_.  
a) Test statistics                      b) Significance level  
c) Statement of hypothesis          d) Critical region
- 2) The parameter E which we use for least square method is called as \_\_\_\_\_.  
a) Sum of residues                      b) Residues  
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a) Stochastic Gradient Descent      b) Batch Gradient Descent  
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- 4) What is the full form of KKT?  
a) Kret Kuhn Tacker                      b) Karush Kuhn Tucker  
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- 5) Among the following, choose the correct application of data science in Healthcare.  
a) Data science for genomics  
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a) Let's complicate the problem      b) Solve the problem  
c) Visualize the problem                d) None of the above
- 7) The concept of Eigen values and vectors is applicable to \_\_\_\_\_.  
a) Scalar matrix                          b) Identity matrix  
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- 8) Simpson's rule assumes that boundary between the ordinates are parabolic arcs.  
a) True                                        b) False

- 9) Find the mode and median of the 9 consecutive number:  
12, 7, 8, 14, 21, 23, 27, 7, 11
- |          |          |
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| a) 12, 9 | b) 7, 9  |
| c) 7, 12 | d) 11, 9 |
- 10) Which of the following is correct application for Eigenvectors?
- |                     |                     |
|---------------------|---------------------|
| a) Computer vision  | b) Physics          |
| c) Machine learning | d) All of the above |
- 11) The correlation coefficient is \_\_\_\_\_
- a) The square of the coefficient of determination
  - b) Can never be negative
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- 12) Normal Distribution is applied for \_\_\_\_\_.
- a) Continuous Random Distribution
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- 13) What does the central limit theorem state?
- a) if the sample size increases sampling distribution must approach normal distribution
  - b) if the sample size decreases then the sample distribution must approach normal distribution
  - c) if the sample size increases then the sampling distribution much approach an exponential distribution
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- 14) The probability of rejecting a true hypothesis is called \_\_\_\_\_.
- |                    |                            |
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| a) Critical region | b) Level of significance   |
| c) Test statistics | d) Statement of hypothesis |

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Mathematics for Data Science**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Three) 12**
- What is Data Science?
  - Consider the ages of five employees as 30, 30, 32, 38, 60 years. Calculate the measures of central tendency.
  - Explain the term hyper planes and half-planes.
  - What is central tendencies?
- Q.3 Answer the following questions. (Any Two) 16**
- Explain Data Science Life Cycle.
  - Explain in detail Distance measures types in data science.
  - What are Eigen values & Eigenvectors?

**Section – II**

- Q.4 Answer the following questions. (Any Three) 12**
- The mean age of people in a colony is 34 years. Suppose the standard deviation is 15 years. The sample of size is 50. Find the mean and standard deviation of the sample.
  - What Is Hypothesis Testing in Statistics?
  - What is KKT condition? Explain in short.
  - What is the Least Squares Method?
- Q.5 Answer the following questions. (Any Two) 16**
- A fair die is rolled, Let A be the event that shows an outcome is an odd number, so  $A = \{1, 3, 5\}$ . Also, suppose B the event that shows the outcome is less than or equal to 3, so  $B = \{1, 2, 3\}$ . Then what is the probability of A,  $P(A)$ , and what is the probability A given B,  $P(A | B)$ ?
  - Explain in detail Statistical Hypothesis Testing. What is P-value?
  - What is gradient descent? How does gradient descent work? Explain with its types.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Mathematics for Data Science**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no. 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is correct application for Eigenvectors?
 

|                     |                     |
|---------------------|---------------------|
| a) Computer vision  | b) Physics          |
| c) Machine learning | d) All of the above |
- 2) The correlation coefficient is \_\_\_\_\_.
 

|                                                        |
|--------------------------------------------------------|
| a) The square of the coefficient of determination      |
| b) Can never be negative                               |
| c) The square root of the coefficient of determination |
| d) The same as r square                                |
- 3) Normal Distribution is applied for \_\_\_\_\_.
 

|                                   |
|-----------------------------------|
| a) Continuous Random Distribution |
| b) Discrete Random Variable       |
| c) Irregular Random Variable      |
| d) Uncertain Random Variable      |
- 4) What does the central limit theorem state?
 

|                                                                                                          |
|----------------------------------------------------------------------------------------------------------|
| a) if the sample size increases sampling distribution must approach normal distribution                  |
| b) if the sample size decreases then the sample distribution must approach normal distribution           |
| c) if the sample size increases then the sampling distribution much approach an exponential distribution |
| d) if the sample size decreases then the sampling distribution much approach an exponential distribution |
- 5) The probability of rejecting a true hypothesis is called \_\_\_\_\_.
 

|                    |                            |
|--------------------|----------------------------|
| a) Critical region | b) Level of significance   |
| c) Test statistics | d) Statement of hypothesis |
- 6) A statistic on the basis of which a decision is made about the hypothesis of interest is called \_\_\_\_\_.
 

|                            |                       |
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| a) Test statistics         | b) Significance level |
| c) Statement of hypothesis | d) Critical region    |

- Page 11 of 12

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Mathematics for Data Science**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Three) 12**
- What is Data Science?
  - Consider the ages of five employees as 30, 30, 32, 38, 60 years. Calculate the measures of central tendency.
  - Explain the term hyper planes and half-planes.
  - What is central tendencies?
- Q.3 Answer the following questions. (Any Two) 16**
- Explain Data Science Life Cycle.
  - Explain in detail Distance measures types in data science.
  - What are Eigen values & Eigenvectors?

**Section – II**

- Q.4 Answer the following questions. (Any Three) 12**
- The mean age of people in a colony is 34 years. Suppose the standard deviation is 15 years. The sample of size is 50. Find the mean and standard deviation of the sample.
  - What Is Hypothesis Testing in Statistics?
  - What is KKT condition? Explain in short.
  - What is the Least Squares Method?
- Q.5 Answer the following questions. (Any Two) 16**
- A fair die is rolled, Let A be the event that shows an outcome is an odd number, so  $A = \{1, 3, 5\}$ . Also, suppose B the event that shows the outcome is less than or equal to 3, so  $B = \{1, 2, 3\}$ . Then what is the probability of A,  $P(A)$ , and what is the probability A given B,  $P(A | B)$ ?
  - Explain in detail Statistical Hypothesis Testing. What is P-value?
  - What is gradient descent? How does gradient descent work? Explain with its types.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The \_\_\_\_\_ is the message after transformation.
  - a) Plaintext
  - b) Secret-text
  - c) Ciphertext
  - d) None of the above
- 2) The keys used in cryptography are \_\_\_\_\_.
  - a) Private Key
  - b) Public Key
  - c) Secret Key
  - d) All of the above
- 3) In symmetric-key cryptography, the key locks and unlocks the box is \_\_\_\_\_.
  - a) Shared
  - b) Same
  - c) Private
  - d) Public
- 4) In asymmetric key cryptography, the private key is kept by \_\_\_\_\_.
  - a) sender
  - b) receiver
  - c) sender and receiver
  - d) all the connected devices to the network
- 5) Caesar Cipher is an example of \_\_\_\_\_.
  - a) Poly-alphabetic Cipher
  - b) Mono-alphabetic Cipher
  - c) Multi-alphabetic Cipher
  - d) Bi-alphabetic Cipher
- 6) The DES algorithm has a key length of \_\_\_\_\_.
  - a) 128 Bits
  - b) 32 Bits
  - c) 64 Bits
  - d) 16 Bits
- 7) AES stands for Advanced Encryption Standard.
  - a) True
  - b) False
- 8) RSA algorithm is \_\_\_\_\_ cryptography algorithm.
  - a) Systematic
  - b) Symmetric
  - c) Asymmetric
  - d) None of the mentioned above
- 9) Which of the following modes of operation in DES is used for operating?
  - a) Cipher Feedback Mode (CFB)
  - b) Cipher Block chaining (CBC)
  - c) Electronic code book (ECB)
  - d) Output Feedback Modes (OFB)



- 10) Which of the following is /are offered by the Hash functions?
  - a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above
- 11) A cryptographic hash function is an equation used to verify the \_\_\_\_\_ of data.
  - a) Variety
  - b) Validity
  - c) Veracity
  - d) None of the mentioned above
- 12) MAC is a \_\_\_\_\_.
  - a) one-to-one mapping
  - b) many-to-one mapping
  - c) onto mapping
  - d) None of the mentioned
- 13) What are the common security threats?
  - a) File Shredding
  - b) File sharing and permission
  - c) File corrupting
  - d) File integrity
- 14) A cryptosystem is also termed as \_\_\_\_\_.
  - a) secure system
  - b) cipher system
  - c) cipher-text
  - d) secure algorithm

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cryptography**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Explain the model of network security with diagram.
  - Explain in detail security attacks.
  - Explain Caesar cipher with example.
  - What is difference between monoalphabetic cipher and polyalphabetic cipher?
  - Explain block cipher and stream cipher with diagram.
- Q.3 Answer the following questions. (Any Two) 12**
- Explain the working of DES with diagram.
  - Explain Security services in details.
  - Explain in detail symmetric cipher model with diagram.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- Write application of public key cryptosystem.
  - Explain encryption with public key with diagram.
  - Write hash functions based on using a cipher block chaining technique.
  - Explain Kerberos in details.
  - Write a note on Simplified Depiction of Essential Elements of Digital Signature Process.
- Q.5 Answer the following questions. (Any Two) 12**
- What is MAC? Explain three basic uses of Message authentication code.
  - Explain PIV System Model with diagram.
  - Explain Man-in-the-Middle Attack.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) RSA algorithm is \_\_\_\_\_ cryptography algorithm.
  - a) Systematic
  - b) Symmetric
  - c) Asymmetric
  - d) None of the mentioned above
- 2) Which of the following modes of operation in DES is used for operating?
  - a) Cipher Feedback Mode (CFB)
  - b) Cipher Block chaining (CBC)
  - c) Electronic code book (ECB)
  - d) Output Feedback Modes (OFB)
- 3) Which of the following is /are offered by the Hash functions?
  - a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above
- 4) A cryptographic hash function is an equation used to verify the \_\_\_\_\_ of data.
  - a) Variety
  - b) Validity
  - c) Veracity
  - d) None of the mentioned above
- 5) MAC is a \_\_\_\_\_.
  - a) one-to-one mapping
  - b) many-to-one mapping
  - c) onto mapping
  - d) None of the mentioned
- 6) What are the common security threats?
  - a) File Shredding
  - b) File sharing and permission
  - c) File corrupting
  - d) File integrity
- 7) A cryptosystem is also termed as \_\_\_\_\_.
  - a) secure system
  - b) cipher system
  - c) cipher-text
  - d) secure algorithm
- 8) The \_\_\_\_\_ is the message after transformation.
  - a) Plaintext
  - b) Secret-text
  - c) Ciphertext
  - d) None of the above
- 9) The keys used in cryptography are \_\_\_\_\_.
  - a) Private Key
  - b) Public Key
  - c) Secret Key
  - d) All of the above

- 10)** In symmetric-key cryptography, the key locks and unlocks the box is \_\_\_\_\_.  
a) Shared                      b) Same  
c) Private                     d) Public
- 11)** In asymmetric key cryptography, the private key is kept by \_\_\_\_\_.  
a) sender  
b) receiver  
c) sender and receiver  
d) all the connected devices to the network
- 12)** Caesar Cipher is an example of \_\_\_\_\_.  
a) Poly-alphabetic Cipher          b) Mono-alphabetic Cipher  
c) Multi-alphabetic Cipher        d) Bi-alphabetic Cipher
- 13)** The DES algorithm has a key length of \_\_\_\_\_.  
a) 128 Bits                      b) 32 Bits  
c) 64 Bits                      d) 16 Bits
- 14)** AES stands for Advanced Encryption Standard.  
a) True                         b) False

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Assume suitable data if necessary.  
3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- a) Explain the model of network security with diagram.
  - b) Explain in detail security attacks.
  - c) Explain Caesar cipher with example.
  - d) What is difference between monoalphabetic cipher and polyalphabetic cipher?
  - e) Explain block cipher and stream cipher with diagram.
- Q.3 Answer the following questions. (Any Two) 12**
- a) Explain the working of DES with diagram.
  - b) Explain Security services in details.
  - c) Explain in detail symmetric cipher model with diagram.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- a) Write application of public key cryptosystem.
  - b) Explain encryption with public key with diagram.
  - c) Write hash functions based on using a cipher block chaining technique.
  - d) Explain Kerberos in details.
  - e) Write a note on Simplified Depiction of Essential Elements of Digital Signature Process.
- Q.5 Answer the following questions. (Any Two) 12**
- a) What is MAC? Explain three basic uses of Message authentication code.
  - b) Explain PIV System Model with diagram.
  - c) Explain Man-in-the-Middle Attack.

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cryptography**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A cryptographic hash function is an equation used to verify the \_\_\_\_\_ of data.
  - a) Variety
  - b) Validity
  - c) Veracity
  - d) None of the mentioned above
- 2) MAC is a \_\_\_\_\_.
  - a) one-to-one mapping
  - b) many-to-one mapping
  - c) onto mapping
  - d) None of the mentioned
- 3) What are the common security threats?
  - a) File Shredding
  - b) File sharing and permission
  - c) File corrupting
  - d) File integrity
- 4) A cryptosystem is also termed as \_\_\_\_\_.
  - a) secure system
  - b) cipher system
  - c) cipher-text
  - d) secure algorithm
- 5) The \_\_\_\_\_ is the message after transformation.
  - a) Plaintext
  - b) Secret-text
  - c) Ciphertext
  - d) None of the above
- 6) The keys used in cryptography are \_\_\_\_\_.
  - a) Private Key
  - b) Public Key
  - c) Secret Key
  - d) All of the above
- 7) In symmetric-key cryptography, the key locks and unlocks the box is \_\_\_\_\_.
  - a) Shared
  - b) Same
  - c) Private
  - d) Public
- 8) In asymmetric key cryptography, the private key is kept by \_\_\_\_\_.
  - a) sender
  - b) receiver
  - c) sender and receiver
  - d) all the connected devices to the network
- 9) Caesar Cipher is an example of \_\_\_\_\_.
  - a) Poly-alphabetic Cipher
  - b) Mono-alphabetic Cipher
  - c) Multi-alphabetic Cipher
  - d) Bi-alphabetic Cipher

- 10) The DES algorithm has a key length of \_\_\_\_\_.
  - a) 128 Bits
  - b) 32 Bits
  - c) 64 Bits
  - d) 16 Bits
- 11) AES stands for Advanced Encryption Standard.
  - a) True
  - b) False
- 12) RSA algorithm is \_\_\_\_\_ cryptography algorithm.
  - a) Systematic
  - b) Symmetric
  - c) Asymmetric
  - d) None of the mentioned above
- 13) Which of the following modes of operation in DES is used for operating?
  - a) Cipher Feedback Mode (CFB)
  - b) Cipher Block chaining (CBC)
  - c) Electronic code book (ECB)
  - d) Output Feedback Modes (OFB)
- 14) Which of the following is /are offered by the Hash functions?
  - a) Authentication
  - b) Non repudiation
  - c) Data Integrity
  - d) All of the above

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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cryptography**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

- Q.2 Answer the following questions. (Any Four) 16**
- Explain the model of network security with diagram.
  - Explain in detail security attacks.
  - Explain Caesar cipher with example.
  - What is difference between monoalphabetic cipher and polyalphabetic cipher?
  - Explain block cipher and stream cipher with diagram.
- Q.3 Answer the following questions. (Any Two) 12**
- Explain the working of DES with diagram.
  - Explain Security services in details.
  - Explain in detail symmetric cipher model with diagram.

**Section – II**

- Q.4 Answer the following questions. (Any Four) 16**
- Write application of public key cryptosystem.
  - Explain encryption with public key with diagram.
  - Write hash functions based on using a cipher block chaining technique.
  - Explain Kerberos in details.
  - Write a note on Simplified Depiction of Essential Elements of Digital Signature Process.
- Q.5 Answer the following questions. (Any Two) 12**
- What is MAC? Explain three basic uses of Message authentication code.
  - Explain PIV System Model with diagram.
  - Explain Man-in-the-Middle Attack.



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| <b>Seat No.</b> |  |
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Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks

Duration: 30 Minutes

Marks: 14

## 14

- 1) The DES algorithm has a key length of \_\_\_\_\_.  
a) 128 Bits                                      b) 32 Bits  
c) 64 Bits                                        d) 16 Bits
- 2) AES stands for Advanced Encryption Standard.  
a) True                                              b) False
- 3) RSA algorithm is \_\_\_\_\_ cryptography algorithm.  
a) Systematic                                      b) Symmetric  
c) Asymmetric                                     d) None of the mentioned above
- 4) Which of the following modes of operation in DES is used for operating?  
a) Cipher Feedback Mode (CFB)  
b) Cipher Block chaining (CBC)  
c) Electronic code book (ECB)  
d) Output Feedback Modes (OFB)
- 5) Which of the following is /are offered by the Hash functions?  
a) Authentication                                  b) Non repudiation  
c) Data Integrity                                   d) All of the above
- 6) A cryptographic hash function is an equation used to verify the \_\_\_\_\_ of data.  
a) Variety                                              b) Validity  
c) Veracity                                            d) None of the mentioned above
- 7) MAC is a \_\_\_\_\_.  
a) one-to-one mapping                              b) many-to-one mapping  
c) onto mapping                                      d) None of the mentioned
- 8) What are the common security threats?  
a) File Shredding                                   b) File sharing and permission  
c) File corrupting                                   d) File integrity



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**S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Cryptography**

Day &amp; Date: Tuesday, 14-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Four) 16**

- Explain the model of network security with diagram.
- Explain in detail security attacks.
- Explain Caesar cipher with example.
- What is difference between monoalphabetic cipher and polyalphabetic cipher?
- Explain block cipher and stream cipher with diagram.

**Q.3 Answer the following questions. (Any Two) 12**

- Explain the working of DES with diagram.
- Explain Security services in details.
- Explain in detail symmetric cipher model with diagram.

**Section – II**

**Q.4 Answer the following questions. (Any Four) 16**

- Write application of public key cryptosystem.
- Explain encryption with public key with diagram.
- Write hash functions based on using a cipher block chaining technique.
- Explain Kerberos in details.
- Write a note on Simplified Depiction of Essential Elements of Digital Signature Process.

**Q.5 Answer the following questions. (Any Two) 12**

- What is MAC? Explain three basic uses of Message authentication code.
- Explain PIV System Model with diagram.
- Explain Man-in-the-Middle Attack.

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Set **P**

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The use of Romberg's method is \_\_\_\_\_.  
 a) To solve simultaneous linear equations  
 b) To find root of the equation  
 c) To evaluate definite integration  
 d) To find eigen values
- 2) As soon as a new value of a variable is found by iteration, it is used immediately in the next step, this method is called as \_\_\_\_\_.  
 a) Gauss-Jacobi's method                      b) Gauss-Seidal method  
 c) Gauss-Jordan method                      d) Gauss Elimination method
- 3) When Gauss Elimination method is used to solve set of equation  $AX = B$ , matrix  $A$  is transformed to \_\_\_\_\_.  
 a) Upper triangular matrix                      b) Diagonal matrix  
 c) Lower triangular matrix                      d) Identity matrix
- 4) The number of strips required in Weddel's rule is \_\_\_\_\_.  
 a) A Multiple of 6                                      b) A multiple of 10  
 c) A Multiple of 3                                      d) A multiple of 2
- 5) The order of convergence of Regulafalsi method for finding roots of equation  $(x) = 0$  is \_\_\_\_\_.  
 a) Second order                                      b) Cubic order  
 c) First order                                              d) Very slow
- 6) A root of the equation  $x - \cos x = 0$  lies between \_\_\_\_\_.  
 a) 1 and 2                                              b) 2 and 3  
 c) 0 and 1                                              d) -1 and 0
- 7) The Newton - Raphson method fails when \_\_\_\_\_.  
 a)  $f'(x)$  is negative                                      b)  $f'(x)$  is positive  
 c) Never fails                                              c)  $f'(x)$  is zero
- 8) The Multiplication of closed interval  $[-3,4]. [-3,5] =$  \_\_\_\_\_.  
 a)  $-15,20$                                               b)  $1\ 15, 1\ 20$   
 c)  $[20, -15]$                                               d)  $9,15$

- a) 3                  b) 3.5  
c) 4                  d) 4.5

- a)  $(0,1)$   
c)  $[0,1]$
- b)  $[0,1]$   
d)  $[0,1)$

- Which of the following is true for fuzzy sets?
- a)  $\overline{A \cup B} = \bar{A} \cup \bar{B}$
- b)  $\overline{A \cap B} = \bar{A} \cup \bar{B}$
- c)  $\bar{\bar{A}} \subseteq A$
- d)  $A \subseteq \bar{A}$

- |          |   |      |   |      |   |
|----------|---|------|---|------|---|
| $t$ :    | 0 | 0.5  | 1 | 1.5  | 2 |
| $f(t)$ : | 0 | 0.25 | 1 | 2.25 | 4 |

a) 2.66668                      b) 2.66667  
c) 2.66669                      d) None

- 14)** The dominant eigen value of the matrix  $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$  is
- a) 0.3722                      b) -5.3723  
c) 5.3723                      d) 10.7445

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| Set | P |
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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.**

**09**

- Solve the system of equations by using Gauss-Jacobi method  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve the system of equations by using Gauss-Jacobi method.  
 $8x - 3y + 2z = 20, 4x + 11y - z = 33, 6x + 3y + 12z = 35$
- Find a real root of the equation  $e^x = x^3 + \cos 25$  take  $x_0 = 4.5$  by Using Newton-Raphson method correct to 3 decimal places.
- Find positive root of the equation  $x \log_{10} x = 1.2$  by Using false-position method correct to 3 decimal places.
- Using power method find eigen values & corresponding eigen vectors  
 $A = \begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$  take  $x_0 = [1, 0, 0]^T$  upto 5 iterations.

**Q.3 Attempt any three.**

**09**

- Solve the system of equation by using Gauss-Seidal method  
 $83x + 11y - 4z = 95, 7x + 52y + 13z = 104, 3x + 8y + 29z = 71$   
 (three iterations)
- Find the double root of the equation  $x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$  by using generalized Newton-Raphson method.
- Evaluate  $\int_0^{1/2} \int_0^{1/2} \frac{\sin xy}{1+xy} dx dy$  by using Simpson's rule  $h = k = 1/4$
- By using trapezoidal rule, evaluate  $\int_4^{5.2} \log_e x dx, n = 6$
- By using Weddell's rule find  $\int_0^{0.6} e^{-x^2} dx dy$  by taking  $n = 6$

**Q.4 Attempt any two**

- a) Apply factorization method to solve the equations.  
 $3x + 2y + 7z = 4$ ,  $2x + 3y + z = 5$ ,  $3x + 4y + z = 7$
- b) Perform two iterations of Newton-Raphson method of find a solution of the system.  $x^2 + xy = 6$ ,  $x^2 - y^2 = 3$  Take  $x_0 = y_0 = 1$
- c) Evaluate by using Romberg's method.  $I = \int_0^1 \frac{dx}{1+x^2}$  take  $h = 0.5, 0.25, 0.125$  respectively.

**Section – II****Q.5 Attempt any three**

09

- a) Let  $A, B$  be the fuzzy sets define on universal set  $X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3\}$  as  
 $A = \frac{1}{-5} + \frac{0.75}{-4} + \frac{0.20}{-3} + \frac{0.8}{-2} + \frac{0.32}{-1} + \frac{0.28}{0} + \frac{0.9}{1} + \frac{0.65}{2} + \frac{1}{3}$   
 $B = \frac{0}{-5} + \frac{0.80}{-4} + \frac{0.20}{-3} + \frac{0.70}{-2} + \frac{0.20}{-1} + \frac{0.15}{0} + \frac{1}{1} + \frac{0.60}{2} + \frac{1}{3}$  find  $S(A, B)$ ,  $S(B, A)$
- b) Find Strong  $\alpha$ -cuts of the fuzzy set  $A$  defined by membership function.  

$$A(x) = \begin{cases} \frac{x-10}{20} & 10 \leq x \leq 30 \\ \frac{40-x}{10} & 30 < x \leq 40 \\ 0 & \text{otherwise} \end{cases} \quad \text{for } \alpha = 0, 0.3, 0.9$$
- c) Solve  $Max z = 3x_1 + 4x_2$  subject to constraints  
 $x_1 - x_2 \leq 1$   $-x_1 + x_2 \leq 2$   $x_1, x_2 \geq 0$
- d) Verify which of the following fuzzy sets are fuzzy number  
 i)  $A = \frac{1}{1} + \frac{0.5}{2} + \frac{0.6}{3} + \frac{0.7}{4} + \frac{0.8}{5}$   
 ii)  $B(x) = \log x, x \in [1, 2.72]$   
 iii) Customer relationship management
- e) Find  $f(A)$ , is  $A$  be a fuzzy set defined on universal set  
 $X = \{-3, -2, -1, 0, 1, 2, 3\}$  by the membership function  $A(x) = \frac{x+3}{10} \forall x \in X$  &  
 $f$  be a function defined on  $X$  as  $f(x) = 2x^2 + 10$

**Q.6 Attempt any three**

09

- a) Let  $A$  be a fuzzy set defined on universal set  $x = \{0, 1, 2, 3, 4, 5\}$  by the membership function  $A(x) = e^{-x} \forall x \in X$ . Then fuzzy cardinality of  $A$
- b) Let  $A, B$  be any two fuzzy sets defined on universal set  $X$  an  $\alpha, \beta \in [0, 1]$  then prove that  
 i)  ${}^\alpha(A \cap B) = {}^\alpha A \cap {}^\alpha B$   
 ii) If  $\alpha \leq \beta$  then  ${}^\beta A \subseteq {}^\alpha B$
- c) A building firm possesses four cranes each of which has a distance (km) from four different constructions sites as shown in table

|       | I   | II  | III | IV  |
|-------|-----|-----|-----|-----|
| $C_1$ | 90  | 75  | 75  | 80  |
| $C_2$ | 35  | 85  | 55  | 65  |
| $C_3$ | 125 | 95  | 90  | 105 |
| $C_4$ | 45  | 110 | 95  | 115 |

Place the cranes (one for each construction site) in such a way that the overall distance required for the transfer is as small as possible.

- d) Solve the fuzzy equation  $A + X = B$  where  $A, B$  are fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x-9}{2} & 9 \leq x \leq 11 \\ \frac{14-x}{3} & 11 < x \leq 14 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-5}{9-x} & 5 \leq x \leq 6 \\ \frac{3}{3} & 6 < x \leq 9 \\ 0 & \text{otherwise} \end{cases}$$

- e) Let  $A$  be a fuzzy set defined on universal set  $[-1,1]$  by the membership function

$$A(x) = \begin{cases} x+1 & -1 \leq x \leq 0 \\ 1-x & 0 < x \leq 1 \end{cases}$$

- Find i) Boundary of  $A$   
ii) Core of  $A$

### Q.7 Attempt any two

10

- a) Max  $z = 4x_1 + 3x_2 + 6x_3$  subject to

$$2x_1 + 3x_2 + 2x_3 \leq 440$$

$$4x_1 + 3x_2 \leq 470$$

$$2x_1 + 5x_2 \leq 430 \quad x_1, x_2, x_3 \geq 0$$

- b) Let  $A, B$  the fuzzy number defined by the membership functions

$$A(x) = \begin{cases} \frac{x-1}{4} & 1 \leq x \leq 15 \\ 6-x & 5 \leq x \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-6}{4} & 6 \leq x \leq 10 \\ 11-x & 10 < x \leq 11 \\ 0 & \text{otherwise} \end{cases}$$

Find  $\text{Max}(A, B)$

- c) Let  $A, B$  be the fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x+5}{2} & -5 \leq x \leq -3 \\ -x/3 & -3 < x \leq 0 \\ 0 & \text{otherwise} \end{cases}$$

Find a fuzzy number  $A, B$



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Max. Marks: 70

Marks: 14

14

- 6)** For the data

|          |   |      |   |      |   |
|----------|---|------|---|------|---|
| $t$ :    | 0 | 0.5  | 1 | 1.5  | 2 |
| $f(t)$ : | 0 | 0.25 | 1 | 2.25 | 4 |

The value of  $\int_0^2 f(t)$  by Simpson's 1/3<sup>rd</sup> rule is \_\_\_\_\_.

- a) 2.66668                      b) 2.66667  
c) 2.66669                      d) None
- 7) The dominant eigen value of the matrix  $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$  is  
a) 0.3722                        b) -5.3723  
c) 5.3723                        d) 10.7445

- 8) The use of Romberg's method is \_\_\_\_\_.  
a) To solve simultaneous linear equations  
b) To find root of the equation  
c) To evaluate definite integration  
d) To find eigen values
- 9) As soon as a new value of a variable is found by iteration, it is used immediately in the next step, this method is called as \_\_\_\_\_.  
a) Gauss-Jacobi's method                      b) Gauss-Seidal method  
c) Gauss-Jordan method                      d) Gauss Elimination method
- 10) When Gauss Elimination method is used to solve set of equation  $AX = B$ , matrix  $A$  is transformed to \_\_\_\_\_.  
a) Upper triangular matrix                      b) Diagonal matrix  
c) Lower triangular matrix                      d) Identity matrix
- 11) The number of strips required in Weddel's rule is \_\_\_\_\_.  
a) A Multiple of 6                                      b) A multiple of 10  
c) A Multiple of 3                                      d) A multiple of 2
- 12) The order of convergence of Regulafalsi method for finding roots of equation  $(x) = 0$  is \_\_\_\_\_.  
a) Second order                                      b) Cubic order  
c) First order                                              d) Very slow
- 13) A root of the equation  $x - \cos x = 0$  lies between \_\_\_\_\_.  
a) 1 and 2                                              b) 2 and 3  
c) 0 and 1                                              d) -1 and 0
- 14) The Newton - Raphson method fails when \_\_\_\_\_.  
a)  $f'(x)$  is negative                                      b)  $f'(x)$  is positive  
c) Never fails                                              c)  $f'(x)$  is zero

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**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

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**Section – I**

**Q.2 Attempt any three.**

**09**

- Solve the system of equations by using Gauss-Jacobi method  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
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- a) Apply factorization method to solve the equations.  
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**Section – II****Q.5 Attempt any three**

09

- a) Let  $A, B$  be the fuzzy sets define on universal set  $X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3\}$  as  
 $A = \frac{1}{-5} + \frac{0.75}{-4} + \frac{0.20}{-3} + \frac{0.8}{-2} + \frac{0.32}{-1} + \frac{0.28}{0} + \frac{0.9}{1} + \frac{0.65}{2} + \frac{1}{3}$   
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- d) Verify which of the following fuzzy sets are fuzzy number  
 i)  $A = 1/1 + \frac{0.5}{2} + \frac{0.6}{3} + \frac{0.7}{4} + \frac{0.8}{5}$   
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- e) Find  $f(A)$ , is  $A$  be a fuzzy set defined on universal set  
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 $f$  be a function defined on  $X$  as  $f(x) = 2x^2 + 10$

**Q.6 Attempt any three**

09

- a) Let  $A$  be a fuzzy set defined on universal set  $x = \{0, 1, 2, 3, 4, 5\}$  by the membership function  $A(x) = e^{-x} \forall x \in X$ . Then fuzzy cardinality of  $A$
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- c) A building firm possesses four cranes each of which has a distance (km) from four different constructions sites as shown in table

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Place the cranes (one for each construction site) in such a way that the overall distance required for the transfer is as small as possible.

- d) Solve the fuzzy equation  $A + X = B$  where  $A, B$  are fuzzy numbers defined by membership functions.

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- e) Let  $A$  be a fuzzy set defined on universal set  $[-1,1]$  by the membership function

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- Find i) Boundary of  $A$   
ii) Core of  $A$

### Q.7 Attempt any two

10

- a) Max  $z = 4x_1 + 3x_2 + 6x_3$  subject to

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Find  $\text{Max}(A, B)$

- c) Let  $A, B$  be the fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x+5}{2} & -5 \leq x \leq -3 \\ -x/3 & -3 < x \leq 0 \\ 0 & \text{otherwise} \end{cases}$$

Find a fuzzy number  $A, B$

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| <b>Seat No.</b> |  |
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Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.

3) Figures to the right indicates full marks.

Marks: 14

14

- 1) If A is a fuzzy number then boundary of A is \_\_\_\_\_.  
a) Unbounded                                      b) Bounded  
c) Finite                                              d) None of these
- 2) Which of the following is true for fuzzy sets?  
a)  $\overline{A \cup B} = \bar{A} \cup \bar{B}$                                       b)  $\overline{A \cap B} = \bar{A} \cup \bar{B}$   
c)  $\bar{\bar{A}} \subseteq A$                                                           d)  $A \subseteq \bar{\bar{A}}$

- 3) For the data**

|          |   |      |   |      |   |
|----------|---|------|---|------|---|
| $t$ :    | 0 | 0.5  | 1 | 1.5  | 2 |
| $f(t)$ : | 0 | 0.25 | 1 | 2.25 | 4 |

The value of  $\int_0^2 f(t)$  by Simpson's 1/3<sup>rd</sup> rule is \_\_\_\_\_.

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**Section – II****Q.5 Attempt any three**

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**Q.6 Attempt any three**

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$$A(x) = \begin{cases} \frac{x-9}{2} & 9 \leq x \leq 11 \\ \frac{14-x}{3} & 11 < x \leq 14 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-5}{9-x} & 5 \leq x \leq 6 \\ \frac{3}{3} & 6 < x \leq 9 \\ 0 & \text{otherwise} \end{cases}$$

- e) Let  $A$  be a fuzzy set defined on universal set  $[-1,1]$  by the membership function

$$A(x) = \begin{cases} x+1 & -1 \leq x \leq 0 \\ 1-x & 0 < x \leq 1 \end{cases}$$

- Find i) Boundary of  $A$   
ii) Core of  $A$

### Q.7 Attempt any two

10

- a) Max  $z = 4x_1 + 3x_2 + 6x_3$  subject to

$$2x_1 + 3x_2 + 2x_3 \leq 440$$

$$4x_1 + 3x_2 \leq 470$$

$$2x_1 + 5x_2 \leq 430 \quad x_1, x_2, x_3 \geq 0$$

- b) Let  $A, B$  the fuzzy number defined by the membership functions

$$A(x) = \begin{cases} \frac{x-1}{4} & 1 \leq x \leq 15 \\ 6-x & 5 \leq x \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-6}{4} & 6 \leq x \leq 10 \\ 11-x & 10 < x \leq 11 \\ 0 & \text{otherwise} \end{cases}$$

Find  $Max(A, B)$

- c) Let  $A, B$  be the fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x+5}{2} & -5 \leq x \leq -3 \\ -x/3 & -3 < x \leq 0 \\ 0 & \text{otherwise} \end{cases}$$

Find a fuzzy number  $A, B$

**Seat  
No.**

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) A root of the equation  $x - \cos x = 0$  lies between \_\_\_\_\_.  
a) 1 and 2                                      b) 2 and 3  
c) 0 and 1                                        d) -1 and 0
- 2) The Newton - Raphson method fails when \_\_\_\_\_.  
a)  $f'(x)$  is negative                          b)  $f'(x)$  is positive  
c) Never fails                                    d)  $f'(x)$  is zero
- 3) The Multiplication of closed interval  $[-3,4]. [-3,5] =$  \_\_\_\_\_.  
a)  $-15,20$                                         b)  $1\ 15, 1\ 20$   
c)  $[20,-15]$                                       d)  $9,15$
- 4) The scalar cardinality of fuzzy set A defined by the membership function  
 $A(x) = 1 + \frac{x}{10}, x \in \{0, -1, -2, -3, -4\}$   
a) 3                                                      b) 3.5  
c) 4                                                      d) 4.5
- 5) Consider the fuzzy set defined by the membership function  
 $B(x) = e^{-x}, x \in [0, \infty)$  then level set of fuzzy set B is \_\_\_\_\_.  
a)  $(0,1)$                                               b)  $[0,1]$   
c)  $[0,1]$                                               d)  $[0,1)$
- 6) If A is a fuzzy number then boundary of A is \_\_\_\_\_.  
a) Unbounded                                      b) Bounded  
c) Finite                                                d) None of these
- 7) Which of the following is true for fuzzy sets?  
a)  $\overline{A \cup B} = \bar{A} \cup \bar{B}$                           b)  $\overline{A \cap B} = \bar{A} \cup \bar{B}$   
c)  $\bar{\bar{A}} \subseteq A$                                               d)  $A \subseteq \bar{\bar{A}}$



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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**INFORMATION TECHNOLOGY ENGINEERING**  
**Applied Mathematics-II**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any three.**

**09**

- Solve the system of equations by using Gauss-Jacobi method  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve the system of equations by using Gauss-Jacobi method.  
 $8x - 3y + 2z = 20, 4x + 11y - z = 33, 6x + 3y + 12z = 35$
- Find a real root of the equation  $e^x = x^3 + \cos 25$  take  $x_0 = 4.5$  by Using Newton-Raphson method correct to 3 decimal places.
- Find positive root of the equation  $x \log_{10} x = 1.2$  by Using false-position method correct to 3 decimal places.
- Using power method find eigen values & corresponding eigen vectors  
 $A = \begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$  take  $x_0 = [1, 0, 0]^T$  upto 5 iterations.

**Q.3 Attempt any three.**

**09**

- Solve the system of equation by using Gauss-Seidal method  
 $83x + 11y - 4z = 95, 7x + 52y + 13z = 104, 3x + 8y + 29z = 71$   
 (three iterations)
- Find the double root of the equation  $x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$  by using generalized Newton-Raphson method.
- Evaluate  $\int_0^{1/2} \int_0^{1/2} \frac{\sin xy}{1+xy} dx dy$  by using Simpson's rule  $h = k = 1/4$
- By using trapezoidal rule, evaluate  $\int_4^{5.2} \log_e x dx, n = 6$
- By using Weddell's rule find  $\int_0^{0.6} e^{-x^2} dx dy$  by taking  $n = 6$

**Q.4 Attempt any two**

- a) Apply factorization method to solve the equations.  
 $3x + 2y + 7z = 4$ ,  $2x + 3y + z = 5$ ,  $3x + 4y + z = 7$
- b) Perform two iterations of Newton-Raphson method of find a solution of the system.  $x^2 + xy = 6$ ,  $x^2 - y^2 = 3$  Take  $x_0 = y_0 = 1$
- c) Evaluate by using Romberg's method.  $I = \int_0^1 \frac{dx}{1+x^2}$  take  $h = 0.5, 0.25, 0.125$  respectively.

**Section – II****Q.5 Attempt any three**

09

- a) Let  $A, B$  be the fuzzy sets define on universal set  $X = \{-5, -4, -3, -2, -1, 0, 1, 2, 3\}$  as  
 $A = \frac{1}{-5} + \frac{0.75}{-4} + \frac{0.20}{-3} + \frac{0.8}{-2} + \frac{0.32}{-1} + \frac{0.28}{0} + \frac{0.9}{1} + \frac{0.65}{2} + \frac{1}{3}$   
 $B = \frac{0}{-5} + \frac{0.80}{-4} + \frac{0.20}{-3} + \frac{0.70}{-2} + \frac{0.20}{-1} + \frac{0.15}{0} + \frac{1}{1} + \frac{0.60}{2} + \frac{1}{3}$  find  $S(A, B)$ ,  $S(B, A)$
- b) Find Strong  $\alpha$ -cuts of the fuzzy set  $A$  defined by membership function.  

$$A(x) = \begin{cases} \frac{x-10}{20} & 10 \leq x \leq 30 \\ \frac{40-x}{10} & 30 < x \leq 40 \\ 0 & \text{otherwise} \end{cases} \quad \text{for } \alpha = 0, 0.3, 0.9$$
- c) Solve  $Max z = 3x_1 + 4x_2$  subject to constraints  
 $x_1 - x_2 \leq 1$   $-x_1 + x_2 \leq 2$   $x_1, x_2 \geq 0$
- d) Verify which of the following fuzzy sets are fuzzy number  
 i)  $A = 1/1 + \frac{0.5}{2} + \frac{0.6}{3} + \frac{0.7}{4} + \frac{0.8}{5}$   
 ii)  $B(x) = \log x, x \in [1, 2.72]$   
 iii) Customer relationship management
- e) Find  $f(A)$ , is  $A$  be a fuzzy set defined on universal set  
 $X = \{-3, -2, -1, 0, 1, 2, 3\}$  by the membership function  $A(x) = \frac{x+3}{10} \forall x \in X$  &  
 $f$  be a function defined on  $X$  as  $f(x) = 2x^2 + 10$

**Q.6 Attempt any three**

09

- a) Let  $A$  be a fuzzy set defined on universal set  $x = \{0, 1, 2, 3, 4, 5\}$  by the membership function  $A(x) = e^{-x} \forall x \in X$ . Then fuzzy cardinality of  $A$
- b) Let  $A, B$  be any two fuzzy sets defined on universal set  $X$  an  $\alpha, \beta \in [0, 1]$  then prove that  
 i)  ${}^\alpha(A \cap B) = {}^\alpha A \cap {}^\alpha B$   
 ii) If  $\alpha \leq \beta$  then  ${}^\beta A \subseteq {}^\alpha A$
- c) A building firm possesses four cranes each of which has a distance (km) from four different constructions sites as shown in table

|       | I   | II  | III | IV  |
|-------|-----|-----|-----|-----|
| $C_1$ | 90  | 75  | 75  | 80  |
| $C_2$ | 35  | 85  | 55  | 65  |
| $C_3$ | 125 | 95  | 90  | 105 |
| $C_4$ | 45  | 110 | 95  | 115 |

Place the cranes (one for each construction site) in such a way that the overall distance required for the transfer is as small as possible.

- d) Solve the fuzzy equation  $A + X = B$  where  $A, B$  are fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x-9}{2} & 9 \leq x \leq 11 \\ \frac{14-x}{3} & 11 < x \leq 14 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} x-5 & 5 \leq x \leq 6 \\ \frac{9-x}{3} & 6 < x \leq 9 \\ 0 & \text{otherwise} \end{cases}$$

- e) Let  $A$  be a fuzzy set defined on universal set  $[-1,1]$  by the membership function

$$A(x) = \begin{cases} x+1 & -1 \leq x \leq 0 \\ 1-x & 0 < x \leq 1 \end{cases}$$

- Find i) Boundary of  $A$   
ii) Core of  $A$

**Q.7 Attempt any two**

**10**

- a) Max  $z = 4x_1 + 3x_2 + 6x_3$  subject to

$$2x_1 + 3x_2 + 2x_3 \leq 440$$

$$4x_1 + 3x_2 \leq 470$$

$$2x_1 + 5x_2 \leq 430 \quad x_1, x_2, x_3 \geq 0$$

- b) Let  $A, B$  the fuzzy number defined by the membership functions

$$A(x) = \begin{cases} \frac{x-1}{4} & 1 \leq x \leq 15 \\ 6-x & 5 \leq x \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

$$B(x) = \begin{cases} \frac{x-6}{4} & 6 \leq x \leq 10 \\ 11-x & 10 < x \leq 11 \\ 0 & \text{otherwise} \end{cases}$$

Find  $\text{Max}(A, B)$

- c) Let  $A, B$  be the fuzzy numbers defined by membership functions.

$$A(x) = \begin{cases} \frac{x+5}{2} & -5 \leq x \leq -3 \\ -x/3 & -3 < x \leq 0 \\ 0 & \text{otherwise} \end{cases}$$

Find a fuzzy number  $A, B$

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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - I**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The armature of DC machine is made up of laminated sheets to \_\_\_\_\_.  
 a) Reduce hysteresis loss  
 b) Reduce the eddy-current loss  
 c) Reduce armature copper loss  
 d) Increase dissipation of heat from the armature surface
- 2) In D.C. generators, the cause of rapid brush wear may be  
 a) severe sparking  
 b) rough commutator surface  
 c) imperfect contact  
 d) any of the above
- 3) Two generators A and B have 6-poles each. Generator A has wave wound armature while generator B has lap wound armature. The ratio of the induced e.m.f. is generator A and B will be  
 a) 2 : 3  
 b) 3 : 1  
 c) 3 : 2  
 d) 1 : 3
- 4) In a D.C. series motor, if the armature current is reduced by 50%, the torque of the motor will be equal to  
 a) 100% of the previous value  
 b) 50% of the previous value  
 c) 25% of the previous value  
 d) 10% of the previous value
- 5) Out of electrical, mechanical and magnetic losses, the losses which is minimum is \_\_\_\_\_.  
 a) All are equal  
 b) Electrical losses  
 c) Magnetic losses  
 d) Mechanical losses
- 6) Efficiency calculated by Swinburne's test is \_\_\_\_\_.  
 a) Exactly equal  
 b) Over-estimated  
 c) Under-estimated  
 d) Depends on the manual errors
- 7) The type of D.C. motor used for shears and punches is  
 a) shunt motor  
 b) series motor  
 c) differential compound D.C. motor  
 d) cumulative compound D.C. motor



- 8) Scott connection is used for the conversion of  
a) Three phases to two phases      b) Three phases to single phase  
c) Single phase to two phases      d) All of these
- 9) Which of the following is not a part of transformer installation?  
a) Conservator      b) Breather  
c) Buchholz relay      d) Exciter
- 10) Efficiency of a power transformer is of the order of  
a) 100 per cent      b) 98 per cent  
c) 50 per cent      d) 25 per cent
- 11) If  $R_2$  is the resistance of the secondary winding of the transformer and  $K$  is the transformation ratio then the equivalent secondary resistance referred to as primary will be  
a)  $R_2/K$       b)  $R_2/K^2$   
c)  $R_2^2/K^2$       d)  $R_2^2/K$
- 12) For a transformer given of 100 kVA, 220/6000-V transformer, short circuit test is performed. What current rating is needed?  
a) 445A      b) 40A  
c) 60A      d) 30A
- 13) Good voltage regulation of a transformer means  
a) output voltage fluctuation from no load to full load is the least  
b) output voltage fluctuation with power factor is the least  
c) difference between primary and secondary voltage is the least  
d) difference between primary and secondary voltage is maximum
- 14) In the case of the delta-star connection of three phase transformer, the secondary line voltage to the primary line voltage is at  
a) 0-degree      b) 30-degree leading  
c) 30-degree lagging      d) 60-degree lagging

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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - I**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four of the following:**

**16**

- With a neat sketch explain the Hopkinson's test for dc motor.
- Derive the torque equation of DC machine.
- With help of neat diagram explain speed control methods of dc shunt motor.
- A 230 V dc shunt motor has an armature resistance of  $0.5 \Omega$  and a field resistance of  $76\frac{2}{3} \Omega$ . The motor draws a line current of 13 A while running light at 1000 r.p.m. At a certain load, the field circuit resistance is increased by  $38\frac{1}{3} \Omega$ . What is the new speed of the motor if the line current at this load is 42 A?
- A 4 pole, long shunt lap -wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is  $0.03 \Omega$ , series field resistance is  $0.04 \Omega$ , and shunt field resistance is  $200 \Omega$ . The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if speed is 1200 rpm. and flux per pole is 0.02 weber. Neglect armature reaction.
- A 200V DC shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50 ohm and armature resistance are 0.06 ohm. What is the efficiency and power input when output is 7.46 KW?

**Q.3 Attempt two of the following:**

**12**

- With neat sketch explain the armature reaction, its effect and remedies to overcome it.
- A 22.38 KW, 440V, 4 pole wave wound DC shunt motor has 840 armature conductors and 140 commutator segments. Its full load efficiency is 88 % and shunt field current is 1.8 A. If brushes are shifted backward through 1.5 segment to Geometrical Neutral Axis. Find demagnetizing and cross magnetizing ampere- turns?

**OR**

The brake test on a DC shunt motor gave the following results: tensions on two sides of the brake were 2.9 kg and 0.17 kg, radius of pulley 7 cm, speed 1500 rpm. Input current was 2 A at 230V, line current = 2.8 A.  
 Find: 1) Output torque 2) Output power 3) Horse power 4) Efficiency

## Section – II

**Q.4 Attempt any four of the following:****16**

- a) Explain the different losses in the transformer and derive the condition for maximum efficiency.
- b) Draw the vector diagram of the loaded transformer for resistive, capacitive, and inductive load.
- c) Write a short note on YD11 and DY 11 connections of the  $3\phi$  transformer.
- d) A 200 kVA, 6600/400 V, 50 Hz single-phase transformer has 80 turns on the secondary. Calculate: (i) the approximate values of the primary and secondary currents (ii) the approximate number of primary turns (iii) the maximum value of flux.
- e) A 600 KVA, the 1-phase transformer has an efficiency of 92% both at full load and half load at unity power factor. Determine its efficiency at 60% of full load at 0.8 lagging power factor.
- f) A 2200/200 V, 1 ph transformer takes a no-load current of 0.6 A and absorbs 400 watts. Find: (i) Magnetizing component of no load current (ii) Iron loss component of no load current (iii) power factor (iv) Draw phasor diagram for above no load parameters

**Q.5 Attempt any two of the following:****12**

- a) With a neat sketch explain the parallel operation of the transformer.
- b) With a neat sketch explain the open circuit and short circuit test of the transformer. How equivalent circuit parameters and efficiency of a transformer are computed?
- c) A 50 KVA, 4400/220 V transformer has  $R_1 = 3.45 \Omega$ ,  $R_2 = 0.009 \Omega$ ,  $X_1 = 5.2 \Omega$ ,  $X_2 = 0.015 \Omega$ . Calculate for the transformer (i) equivalent resistance referred to primary, (ii) equivalent resistance referred to secondary (iii) equivalent reactance referred to both primary and secondary (iv) equivalent impedance referred to both primary and secondary, (v) total cu losses

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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - I**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Scott connection is used for the conversion of
  - a) Three phases to two phases
  - b) Three phases to single phase
  - c) Single phase to two phases
  - d) All of these
- 2) Which of the following is not a part of transformer installation?
  - a) Conservator
  - b) Breather
  - c) Buchholz relay
  - d) Exciter
- 3) Efficiency of a power transformer is of the order of
  - a) 100 per cent
  - b) 98 per cent
  - c) 50 per cent
  - d) 25 per cent
- 4) If  $R_2$  is the resistance of the secondary winding of the transformer and  $K$  is the transformation ratio then the equivalent secondary resistance referred to as primary will be
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  - c)  $R_2^2/K^2$
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  - c) 30-degree lagging
  - d) 60-degree lagging

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- 13) Efficiency calculated by Swinburne's test is \_\_\_\_\_.  
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- 14) The type of D.C. motor used for shears and punches is  
a) shunt motor  
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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - I**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four of the following:** **16**

- a) With a neat sketch explain the Hopkinson's test for dc motor.
- b) Derive the torque equation of DC machine.
- c) With help of neat diagram explain speed control methods of dc shunt motor.
- d) A 230 V dc shunt motor has an armature resistance of  $0.5 \Omega$  and a field resistance of  $76\frac{2}{3} \Omega$ . The motor draws a line current of 13 A while running light at 1000 r.p.m. At a certain load, the field circuit resistance is increased by  $38\frac{1}{3} \Omega$ . What is the new speed of the motor if the line current at this load is 42 A?
- e) A 4 pole, long shunt lap -wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is  $0.03 \Omega$ , series field resistance is  $0.04 \Omega$ , and shunt field resistance is  $200 \Omega$ . The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if speed is 1200 rpm. and flux per pole is 0.02 weber. Neglect armature reaction.
- f) A 200V DC shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50 ohm and armature resistance are 0.06 ohm. What is the efficiency and power input when output is 7.46 KW?

**Q.3 Attempt two of the following:** **12**

- a) With neat sketch explain the armature reaction, its effect and remedies to overcome it.
- b) A 22.38 KW, 440V, 4 pole wave wound DC shunt motor has 840 armature conductors and 140 commutator segments. Its full load efficiency is 88 % and shunt field current is 1.8 A. If brushes are shifted backward through 1.5 segment to Geometrical Neutral Axis. Find demagnetizing and cross magnetizing ampere- turns?

**OR**

The brake test on a DC shunt motor gave the following results: tensions on two sides of the brake were 2.9 kg and 0.17 kg, radius of pulley 7 cm, speed 1500 rpm. Input current was 2 A at 230V, line current = 2.8 A.  
 Find: 1) Output torque 2) Output power 3) Horse power 4) Efficiency

## Section – II

**Q.4 Attempt any four of the following:****16**

- a) Explain the different losses in the transformer and derive the condition for maximum efficiency.
- b) Draw the vector diagram of the loaded transformer for resistive, capacitive, and inductive load.
- c) Write a short note on YD11 and DY 11 connections of the  $3\phi$  transformer.
- d) A 200 kVA, 6600/400 V, 50 Hz single-phase transformer has 80 turns on the secondary. Calculate: (i) the approximate values of the primary and secondary currents (ii) the approximate number of primary turns (iii) the maximum value of flux.
- e) A 600 KVA, the 1-phase transformer has an efficiency of 92% both at full load and half load at unity power factor. Determine its efficiency at 60% of full load at 0.8 lagging power factor.
- f) A 2200/200 V, 1 ph transformer takes a no-load current of 0.6 A and absorbs 400 watts. Find: (i) Magnetizing component of no load current (ii) Iron loss component of no load current (iii) power factor (iv) Draw phasor diagram for above no load parameters

**Q.5 Attempt any two of the following:****12**

- a) With a neat sketch explain the parallel operation of the transformer.
- b) With a neat sketch explain the open circuit and short circuit test of the transformer. How equivalent circuit parameters and efficiency of a transformer are computed?
- c) A 50 KVA, 4400/220 V transformer has  $R_1 = 3.45 \Omega$ ,  $R_2 = 0.009 \Omega$ ,  $X_1 = 5.2 \Omega$ ,  $X_2 = 0.015 \Omega$ . Calculate for the transformer (i) equivalent resistance referred to primary, (ii) equivalent resistance referred to secondary (iii) equivalent reactance referred to both primary and secondary (iv) equivalent impedance referred to both primary and secondary, (v) total cu losses

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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - I**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) If  $R_2$  is the resistance of the secondary winding of the transformer and  $K$  is the transformation ratio then the equivalent secondary resistance referred to as primary will be
 

|                |              |
|----------------|--------------|
| a) $R_2/K$     | b) $R_2/K^2$ |
| c) $R_2^2/K^2$ | d) $R_2^2/K$ |
- 2) For a transformer given of 100 kVA, 220/6000-V transformer, short circuit test is performed. What current rating is needed?
 

|         |        |
|---------|--------|
| a) 445A | b) 40A |
| c) 60A  | d) 30A |
- 3) Good voltage regulation of a transformer means
 

|                                                                      |
|----------------------------------------------------------------------|
| a) output voltage fluctuation from no load to full load is the least |
| b) output voltage fluctuation with power factor is the least         |
| c) difference between primary and secondary voltage is the least     |
| d) difference between primary and secondary voltage is maximum       |
- 4) In the case of the delta-star connection of three phase transformer, the secondary line voltage to the primary line voltage is at
 

|                      |                      |
|----------------------|----------------------|
| a) 0-degree          | b) 30-degree leading |
| c) 30-degree lagging | d) 60-degree lagging |
- 5) The armature of DC machine is made up of laminated sheets to \_\_\_\_\_.
 

|                                                           |
|-----------------------------------------------------------|
| a) Reduce hysteresis loss                                 |
| b) Reduce the eddy-current loss                           |
| c) Reduce armature copper loss                            |
| d) Increase dissipation of heat from the armature surface |
- 6) In D.C. generators, the cause of rapid brush wear may be
 

|                      |                             |
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| a) severe sparking   | b) rough commutator surface |
| c) imperfect contact | d) any of the above         |





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Set **R**

**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - I**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four of the following:**

16

- With a neat sketch explain the Hopkinson's test for dc motor.
- Derive the torque equation of DC machine.
- With help of neat diagram explain speed control methods of dc shunt motor.
- A 230 V dc shunt motor has an armature resistance of  $0.5 \Omega$  and a field resistance of  $76\frac{2}{3} \Omega$ . The motor draws a line current of 13 A while running light at 1000 r.p.m. At a certain load, the field circuit resistance is increased by  $38\frac{1}{3} \Omega$ . What is the new speed of the motor if the line current at this load is 42 A?
- A 4 pole, long shunt lap -wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is  $0.03 \Omega$ , series field resistance is  $0.04 \Omega$ , and shunt field resistance is  $200 \Omega$ . The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if speed is 1200 rpm. and flux per pole is 0.02 weber. Neglect armature reaction.
- A 200V DC shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50 ohm and armature resistance are 0.06 ohm. What is the efficiency and power input when output is 7.46 KW?

**Q.3 Attempt two of the following:**

12

- With neat sketch explain the armature reaction, its effect and remedies to overcome it.
- A 22.38 KW, 440V, 4 pole wave wound DC shunt motor has 840 armature conductors and 140 commutator segments. Its full load efficiency is 88 % and shunt field current is 1.8 A. If brushes are shifted backward through 1.5 segment to Geometrical Neutral Axis. Find demagnetizing and cross magnetizing ampere- turns?

**OR**

The brake test on a DC shunt motor gave the following results: tensions on two sides of the brake were 2.9 kg and 0.17 kg, radius of pulley 7 cm, speed 1500 rpm. Input current was 2 A at 230V, line current = 2.8 A.  
 Find: 1) Output torque 2) Output power 3) Horse power 4) Efficiency

## Section – II

**Q.4 Attempt any four of the following:****16**

- a) Explain the different losses in the transformer and derive the condition for maximum efficiency.
- b) Draw the vector diagram of the loaded transformer for resistive, capacitive, and inductive load.
- c) Write a short note on YD11 and DY 11 connections of the  $3\phi$  transformer.
- d) A 200 kVA, 6600/400 V, 50 Hz single-phase transformer has 80 turns on the secondary. Calculate: (i) the approximate values of the primary and secondary currents (ii) the approximate number of primary turns (iii) the maximum value of flux.
- e) A 600 KVA, the 1-phase transformer has an efficiency of 92% both at full load and half load at unity power factor. Determine its efficiency at 60% of full load at 0.8 lagging power factor.
- f) A 2200/200 V, 1 ph transformer takes a no-load current of 0.6 A and absorbs 400 watts. Find: (i) Magnetizing component of no load current (ii) Iron loss component of no load current (iii) power factor (iv) Draw phasor diagram for above no load parameters

**Q.5 Attempt any two of the following:****12**

- a) With a neat sketch explain the parallel operation of the transformer.
- b) With a neat sketch explain the open circuit and short circuit test of the transformer. How equivalent circuit parameters and efficiency of a transformer are computed?
- c) A 50 KVA, 4400/220 V transformer has  $R_1 = 3.45 \Omega$ ,  $R_2 = 0.009 \Omega$ ,  $X_1 = 5.2 \Omega$ ,  $X_2 = 0.015 \Omega$ . Calculate for the transformer (i) equivalent resistance referred to primary, (ii) equivalent resistance referred to secondary (iii) equivalent reactance referred to both primary and secondary (iv) equivalent impedance referred to both primary and secondary, (v) total cu losses

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Day & Date: Wednesday, 15-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 13 of 16

- 8) Good voltage regulation of a transformer means  
a) output voltage fluctuation from no load to full load is the least  
b) output voltage fluctuation with power factor is the least  
c) difference between primary and secondary voltage is the least  
d) difference between primary and secondary voltage is maximum
- 9) In the case of the delta-star connection of three phase transformer, the secondary line voltage to the primary line voltage is at  
a) 0-degree  
b) 30-degree leading  
c) 30-degree lagging  
d) 60-degree lagging
- 10) The armature of DC machine is made up of laminated sheets to \_\_\_\_\_.  
a) Reduce hysteresis loss  
b) Reduce the eddy-current loss  
c) Reduce armature copper loss  
d) Increase dissipation of heat from the armature surface
- 11) In D.C. generators, the cause of rapid brush wear may be  
a) severe sparking  
b) rough commutator surface  
c) imperfect contact  
d) any of the above
- 12) Two generators A and B have 6-poles each. Generator A has wave wound armature while generator B has lap wound armature. The ratio of the induced e.m.f. is generator A and B will be  
a) 2 : 3  
b) 3 : 1  
c) 3 : 2  
d) 1 : 3
- 13) In a D.C. series motor, if the armature current is reduced by 50%, the torque of the motor will be equal to  
a) 100% of the previous value  
b) 50% of the previous value  
c) 25% of the previous value  
d) 10% of the previous value
- 14) Out of electrical, mechanical and magnetic losses, the losses which is minimum is \_\_\_\_\_.  
a) All are equal  
b) Electrical losses  
c) Magnetic losses  
d) Mechanical losses

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**S.Y. (B.Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - I**

Day & Date: Wednesday, 15-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four of the following:**

**16**

- With a neat sketch explain the Hopkinson's test for dc motor.
- Derive the torque equation of DC machine.
- With help of neat diagram explain speed control methods of dc shunt motor.
- A 230 V dc shunt motor has an armature resistance of  $0.5 \Omega$  and a field resistance of  $76\frac{2}{3} \Omega$ . The motor draws a line current of 13 A while running light at 1000 r.p.m. At a certain load, the field circuit resistance is increased by  $38\frac{1}{3} \Omega$ . What is the new speed of the motor if the line current at this load is 42 A?
- A 4 pole, long shunt lap -wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is  $0.03 \Omega$ , series field resistance is  $0.04 \Omega$ , and shunt field resistance is  $200 \Omega$ . The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if speed is 1200 rpm. and flux per pole is 0.02 weber. Neglect armature reaction.
- A 200V DC shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50 ohm and armature resistance are 0.06 ohm. What is the efficiency and power input when output is 7.46 KW?

**Q.3 Attempt two of the following:**

**12**

- With neat sketch explain the armature reaction, its effect and remedies to overcome it.
- A 22.38 KW, 440V, 4 pole wave wound DC shunt motor has 840 armature conductors and 140 commutator segments. Its full load efficiency is 88 % and shunt field current is 1.8 A. If brushes are shifted backward through 1.5 segment to Geometrical Neutral Axis. Find demagnetizing and cross magnetizing ampere- turns?

**OR**

The brake test on a DC shunt motor gave the following results: tensions on two sides of the brake were 2.9 kg and 0.17 kg, radius of pulley 7 cm, speed 1500 rpm. Input current was 2 A at 230V, line current = 2.8 A.  
 Find: 1) Output torque 2) Output power 3) Horse power 4) Efficiency

## Section – II

**Q.4 Attempt any four of the following:****16**

- a) Explain the different losses in the transformer and derive the condition for maximum efficiency.
- b) Draw the vector diagram of the loaded transformer for resistive, capacitive, and inductive load.
- c) Write a short note on YD11 and DY 11 connections of the  $3\phi$  transformer.
- d) A 200 kVA, 6600/400 V, 50 Hz single-phase transformer has 80 turns on the secondary. Calculate: (i) the approximate values of the primary and secondary currents (ii) the approximate number of primary turns (iii) the maximum value of flux.
- e) A 600 KVA, the 1-phase transformer has an efficiency of 92% both at full load and half load at unity power factor. Determine its efficiency at 60% of full load at 0.8 lagging power factor.
- f) A 2200/200 V, 1 ph transformer takes a no-load current of 0.6 A and absorbs 400 watts. Find: (i) Magnetizing component of no load current (ii) Iron loss component of no load current (iii) power factor (iv) Draw phasor diagram for above no load parameters

**Q.5 Attempt any two of the following:****12**

- a) With a neat sketch explain the parallel operation of the transformer.
- b) With a neat sketch explain the open circuit and short circuit test of the transformer. How equivalent circuit parameters and efficiency of a transformer are computed?
- c) A 50 KVA, 4400/220 V transformer has  $R_1 = 3.45 \Omega$ ,  $R_2 = 0.009 \Omega$ ,  $X_1 = 5.2 \Omega$ ,  $X_2 = 0.015 \Omega$ . Calculate for the transformer (i) equivalent resistance referred to primary, (ii) equivalent resistance referred to secondary (iii) equivalent reactance referred to both primary and secondary (iv) equivalent impedance referred to both primary and secondary, (v) total cu losses

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**Set****P**

**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Measurement and Instrumentation**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A power factor meter has
  - a) one current circuit and two pressure circuits
  - b) one current circuit and one pressure circuit
  - c) two current circuits and one pressure circuit
  - d) None of the above
- 2) In a dynamometer 3-phase power factor meter, the planes of the-two moving coils are at
  - a) 0°
  - b) 60°
  - c) 90°
  - d) 120°
- 3) The desirable static characteristics of a measuring system are
  - a) accuracy and drift
  - b) accuracy, sensitivity and reproducibility
  - c) drift and dead zone
  - d) static error
- 4) Basically a potentiometer is a device for
  - a) comparing two voltages
  - b) measuring a current
  - c) comparing two currents
  - d) measuring a voltage
- 5) For measurement of inductance having high value, we should use
  - a) Maxwell's bridge
  - b) Maxwell Wein bridge
  - c) Hay's bridge
  - d) All of the above
- 6) A CRO can display
  - a) AC signals
  - b) DC signals
  - c) Both AC and DC signals
  - d) Time invariant signals
- 7) Digital instruments have input impedance of the order of
  - a)  $\Omega$
  - b)  $k\Omega$
  - c)  $M\Omega$
  - d)  $m\Omega$



- 8) Which of the following are integrating instruments?
- a) Ammeters
  - b) Voltmeters
  - c) Wattmeters
  - d) Ampere-hour and watt-hour meters
- 9) Resistances can be measured with the help of
- a) wattmeters
  - b) voltmeters
  - c) ammeters
  - d) ohmmeters and resistance bridges
- 10) A \_\_\_\_\_ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly
- a) deflecting
  - b) Controlling
  - c) damping
  - d) any of the above
- 11) Induction type single phase energy meters measure electric energy in
- a) kW
  - b) Wh
  - c) kWh
  - d) VAR
- 12) \_\_\_\_\_ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another,
- a) Tangent galvanometer
  - b) Meggar
  - c) Current transformer
  - d) None of the above
- 13) A moving iron instrument can be used for
- a) D.C. only
  - b) A.C. only
  - c) both D.C. and A.C
  - d) All of the above
- 14) In a 3-phase power measurement by two wattmeter method the reading of one of the wattmeter was zero. The power factor of the load must be
- a) unity
  - b) 0.5
  - c) 0.3
  - d) zero

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Electrical measurement and instrumentation**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four:** **16**

- a) Define Errors and enlist classification in detail.
- b) Explain in detail shunt & multiplier Ohmmeter with their shape of scale.
- c) Explain Maxwell's inductance bridge with phasor diagram
- d) Give the classifications of Potentiometer. State the working principle of DC potentiometer
- e) List out all the desirable & undesirable characteristics of an instrument

**Q.3 Solve any two:** **12**

- a) Derive the torque equation of a PMMI instrument
- b) Explain the method of measurement of power using two wattmeter for balanced load. Also derive the equation of power factor.
- c) Explain Schering bridge with phasor diagram. Also derive the equation of dissipation factor

**Section – II**

**Q.4 Solve any four:** **16**

- a) Define following terms:
  - i) Burden of an instrument transformer
  - ii) Actual transformation ratio
  - iii) Nominal transformation ratio
  - iv) Turns ratio
- b) Explain with neat diagram electronic counter.
- c) Draw and explain integrating type digital voltmeter.
- d) Enlist the features of CRT.
- e) With neat sketch explain Q- meter.

**Q.5 Solve any two:** **12**

- a) Draw the block diagram of CRO & explain working of each block in detail.
- b) Draw typical phasor diagram of a potential transformer. Derive expression for actual transformation ratio.
- c) Explain Electronic energy meter with construction and working principle.

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Measurement and Instrumentation**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following are integrating instruments?
  - a) Ammeters
  - b) Voltmeters
  - c) Wattmeters
  - d) Ampere-hour and watt-hour meters
- 2) Resistances can be measured with the help of
  - a) wattmeters
  - b) voltmeters
  - c) ammeters
  - d) ohmmeters and resistance bridges
- 3) A \_\_\_\_\_ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly
  - a) deflecting
  - b) Controlling
  - c) damping
  - d) any of the above
- 4) Induction type single phase energy meters measure electric energy in
  - a) kW
  - b) Wh
  - c) kWh
  - d) VAR
- 5) \_\_\_\_\_ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another,
  - a) Tangent galvanometer
  - b) Meggar
  - c) Current transformer
  - d) None of the above
- 6) A moving iron instrument can be used for
  - a) D.C. only
  - b) A.C. only
  - c) both D.C. and A.C
  - d) All of the above
- 7) In a 3-phase power measurement by two wattmeter method the reading of one of the wattmeter was zero. The power factor of the load must be
  - a) unity
  - b) 0.5
  - c) 0.3
  - d) zero

- 8) A power factor meter has  
a) one current circuit and two pressure circuits  
b) one current circuit and one pressure circuit  
c) two current circuits and one pressure circuit  
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- 9) In a dynamometer 3-phase power factor meter, the planes of the-two moving coils are at  
a)  $0^\circ$   
b)  $60^\circ$   
c)  $90^\circ$   
d)  $120^\circ$
- 10) The desirable static characteristics of a measuring system are  
a) accuracy and drift  
b) accuracy, sensitivity and reproducibility  
c) drift and dead zone  
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- 11) Basically a potentiometer is a device for  
a) comparing two voltages  
b) measuring a current  
c) comparing two currents  
d) measuring a voltage
- 12) For measurement of inductance having high value, we should use  
a) Maxwell's bridge  
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c) Hay's bridge  
d) All of the above
- 13) A CRO can display  
a) AC signals  
b) DC signals  
c) Both AC and DC signals  
d) Time invariant signals
- 14) Digital instruments have input impedance of the order of  
a)  $\Omega$   
b)  $k\Omega$   
c)  $M\Omega$   
d)  $m\Omega$

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Electrical measurement and instrumentation**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four:** **16**

- a) Define Errors and enlist classification in detail.
- b) Explain in detail shunt & multiplier Ohmmeter with their shape of scale.
- c) Explain Maxwell's inductance bridge with phasor diagram
- d) Give the classifications of Potentiometer. State the working principle of DC potentiometer
- e) List out all the desirable & undesirable characteristics of an instrument

**Q.3 Solve any two:** **12**

- a) Derive the torque equation of a PMMI instrument
- b) Explain the method of measurement of power using two wattmeter for balanced load. Also derive the equation of power factor.
- c) Explain Schering bridge with phasor diagram. Also derive the equation of dissipation factor

**Section – II**

**Q.4 Solve any four:** **16**

- a) Define following terms:
  - i) Burden of an instrument transformer
  - ii) Actual transformation ratio
  - iii) Nominal transformation ratio
  - iv) Turns ratio
- b) Explain with neat diagram electronic counter.
- c) Draw and explain integrating type digital voltmeter.
- d) Enlist the features of CRT.
- e) With neat sketch explain Q- meter.

**Q.5 Solve any two:** **12**

- a) Draw the block diagram of CRO & explain working of each block in detail.
- b) Draw typical phasor diagram of a potential transformer. Derive expression for actual transformation ratio.
- c) Explain Electronic energy meter with construction and working principle.

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Measurement and Instrumentation**

Day & Date: Tuesday, 21-03-2023  
 Time: 02:00 PM To 05:00 PM

Max Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options. 14**

- 1) Induction type single phase energy meters measure electric energy in
  - a) kW
  - b) Wh
  - c) kWh
  - d) VAR
- 2) \_\_\_\_\_ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another,
  - a) Tangent galvanometer
  - b) Meggar
  - c) Current transformer
  - d) None of the above
- 3) A moving iron instrument can be used for
  - a) D.C. only
  - b) A.C. only
  - c) both D.C. and A.C
  - d) All of the above
- 4) In a 3-phase power measurement by two wattmeter method the reading of one of the wattmeter was zero. The power factor of the load must be
  - a) unity
  - b) 0.5
  - c) 0.3
  - d) zero
- 5) A power factor meter has
  - a) one current circuit and two pressure circuits
  - b) one current circuit and one pressure circuit
  - c) two current circuits and one pressure circuit
  - d) None of the above
- 6) In a dynamometer 3-phase power factor meter, the planes of the-two moving coils are at
  - a) 0°
  - b) 60°
  - c) 90°
  - d) 120°
- 7) The desirable static characteristics of a measuring system are
  - a) accuracy and drift
  - b) accuracy, sensitivity and reproducibility
  - c) drift and dead zone
  - d) static error

- 8) Basically a potentiometer is a device for  
a) comparing two voltages                      b) measuring a current  
c) comparing two currents                      d) measuring a voltage
- 9) For measurement of inductance having high value, we should use  
a) Maxwell's bridge                      b) Maxwell Wein bridge  
c) Hay's bridge                      d) All of the above
- 10) A CRO can display  
a) AC signals                      b) DC signals  
c) Both AC and DC signals                      d) Time invariant signals
- 11) Digital instruments have input impedance of the order of  
a)  $\Omega$                       b)  $k\Omega$   
c)  $M\Omega$                       d)  $m\Omega$
- 12) Which of the following are integrating instruments?  
a) Ammeters  
b) Voltmeters  
c) Wattmeters  
d) Ampere-hour and watt-hour meters
- 13) Resistances can be measured with the help of  
a) wattmeters  
b) voltmeters  
c) ammeters  
d) ohmmeters and resistance bridges
- 14) A \_\_\_\_\_ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly  
a) deflecting                      b) Controlling  
c) damping                      d) any of the above

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**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**

**Electrical measurement and instrumentation**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four:** **16**

- a) Define Errors and enlist classification in detail.
- b) Explain in detail shunt & multiplier Ohmmeter with their shape of scale.
- c) Explain Maxwell's inductance bridge with phasor diagram
- d) Give the classifications of Potentiometer. State the working principle of DC potentiometer
- e) List out all the desirable & undesirable characteristics of an instrument

**Q.3 Solve any two:** **12**

- a) Derive the torque equation of a PMMI instrument
- b) Explain the method of measurement of power using two wattmeter for balanced load. Also derive the equation of power factor.
- c) Explain Schering bridge with phasor diagram. Also derive the equation of dissipation factor

**Section – II**

**Q.4 Solve any four:** **16**

- a) Define following terms:
  - i) Burden of an instrument transformer
  - ii) Actual transformation ratio
  - iii) Nominal transformation ratio
  - iv) Turns ratio
- b) Explain with neat diagram electronic counter.
- c) Draw and explain integrating type digital voltmeter.
- d) Enlist the features of CRT.
- e) With neat sketch explain Q- meter.

**Q.5 Solve any two:** **12**

- a) Draw the block diagram of CRO & explain working of each block in detail.
- b) Draw typical phasor diagram of a potential transformer. Derive expression for actual transformation ratio.
- c) Explain Electronic energy meter with construction and working principle.



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S

**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Measurement and Instrumentation**

Day &amp; Date: Tuesday, 21-03-2023

Max Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) A CRO can display
  - a) AC signals
  - b) DC signals
  - c) Both AC and DC signals
  - d) Time invariant signals
- 2) Digital instruments have input impedance of the order of
  - a)  $\Omega$
  - b)  $k\Omega$
  - c)  $M\Omega$
  - d)  $m\Omega$
- 3) Which of the following are integrating instruments?
  - a) Ammeters
  - b) Voltmeters
  - c) Wattmeters
  - d) Ampere-hour and watt-hour meters
- 4) Resistances can be measured with the help of
  - a) wattmeters
  - b) voltmeters
  - c) ammeters
  - d) ohmmeters and resistance bridges
- 5) A \_\_\_\_\_ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly
  - a) deflecting
  - b) Controlling
  - c) damping
  - d) any of the above
- 6) Induction type single phase energy meters measure electric energy in
  - a) kW
  - b) Wh
  - c) kWh
  - d) VAR
- 7) \_\_\_\_\_ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another,
  - a) Tangent galvanometer
  - b) Meggar
  - c) Current transformer
  - d) None of the above
- 8) A moving iron instrument can be used for
  - a) D.C. only
  - b) A.C. only
  - c) both D.C. and A.C
  - d) All of the above

- 9) In a 3-phase power measurement by two wattmeter method the reading of one of the wattmeter was zero. The power factor of the load must be
- |          |         |
|----------|---------|
| a) unity | b) 0.5  |
| c) 0.3   | d) zero |
- 10) A power factor meter has
- |                                                  |
|--------------------------------------------------|
| a) one current circuit and two pressure circuits |
| b) one current circuit and one pressure circuit  |
| c) two current circuits and one pressure circuit |
| d) None of the above                             |
- 11) In a dynamometer 3-phase power factor meter, the planes of the-two moving coils are at
- |               |                |
|---------------|----------------|
| a) $0^\circ$  | b) $60^\circ$  |
| c) $90^\circ$ | d) $120^\circ$ |
- 12) The desirable static characteristics of a measuring system are
- |                                              |
|----------------------------------------------|
| a) accuracy and drift                        |
| b) accuracy, sensitivity and reproducibility |
| c) drift and dead zone                       |
| d) static error                              |
- 13) Basically a potentiometer is a device for
- |                           |                        |
|---------------------------|------------------------|
| a) comparing two voltages | b) measuring a current |
| c) comparing two currents | d) measuring a voltage |
- 14) For measurement of inductance having high value, we should use
- |                     |                        |
|---------------------|------------------------|
| a) Maxwell's bridge | b) Maxwell Wein bridge |
| c) Hay's bridge     | d) All of the above    |

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**Set S**

**S.Y (B. Tech) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022  
ELECTRICAL ENGINEERING**

**Electrical measurement and instrumentation**

Day & Date: Tuesday, 21-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four:** **16**

- a) Define Errors and enlist classification in detail.
- b) Explain in detail shunt & multiplier Ohmmeter with their shape of scale.
- c) Explain Maxwell's inductance bridge with phasor diagram
- d) Give the classifications of Potentiometer. State the working principle of DC potentiometer
- e) List out all the desirable & undesirable characteristics of an instrument

**Q.3 Solve any two:** **12**

- a) Derive the torque equation of a PMMI instrument
- b) Explain the method of measurement of power using two wattmeter for balanced load. Also derive the equation of power factor.
- c) Explain Schering bridge with phasor diagram. Also derive the equation of dissipation factor

**Section – II**

**Q.4 Solve any four:** **16**

- a) Define following terms:
  - i) Burden of an instrument transformer
  - ii) Actual transformation ratio
  - iii) Nominal transformation ratio
  - iv) Turns ratio
- b) Explain with neat diagram electronic counter.
- c) Draw and explain integrating type digital voltmeter.
- d) Enlist the features of CRT.
- e) With neat sketch explain Q- meter.

**Q.5 Solve any two:** **12**

- a) Draw the block diagram of CRO & explain working of each block in detail.
- b) Draw typical phasor diagram of a potential transformer. Derive expression for actual transformation ratio.
- c) Explain Electronic energy meter with construction and working principle.

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Set **P**

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System I**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following will take least time in starting from cold condition to full load operation
  - a) Gas turbine plant
  - b) Nuclear power plant
  - c) Hydro electric power plant
  - d) Thermal power plant
- 2) Which of following generating plants has the minimum operating cost
  - a) Diesel plant
  - b) Hydroelectric plant
  - c) Steam plant
  - d) Nuclear plant
- 3) A gas turbine power plant is best suited for
  - a) Peak load
  - b) Base load
  - c) Emergency
  - d) None of these
- 4) A diesel power plant is generally used as a/an
  - a) Peak loads
  - b) Base load
  - c) Standby/emergency plant
  - d) Any of above
- 5) Which tariff is most ideal tariff for the consumer?
  - a) Two part tariff
  - b) Three part tariff
  - c) Both (a) and (b)
  - d) None of the above
- 6) Domestic consumers are charged \_\_\_\_\_.
  - a) Flat demand tariff
  - b) Block rate tariff
  - c) Flat rate tariff
  - d) Off peak tariff
- 7) Area under the daily load curve divided by 24 hours gives
  - a) Average load
  - b) Maximum demand
  - c) Units generated
  - d) Peak load
- 8) The knowledge of diversity factor helps in determining
  - a) plant capacity
  - b) Maximum demand
  - c) Units generated
  - d) Average load

- 9) Feeder is designed mainly from the point of view of \_\_\_\_\_.  
a) Its current carrying capacity  
b) Voltage drop in it  
c) Operating voltage  
d) Operating Frequency
- 10) A 3 phase 4 wire system is commonly used for \_\_\_\_\_.  
a) Primary distribution  
b) Secondary distribution  
c) Primary transmission  
d) Secondary transmission
- 11) The voltage of the single phase supply to residential consumers is  
a) 110 V  
b) 210 V  
c) 230 V  
d) 400 V
- 12) High voltage transmission lines use  
a) suspension insulators  
b) pin insulators  
c) both (a) and (b)  
d) none of the above
- 13) Overhead lines generally use \_\_\_\_\_.  
a) A.C.S.R. conductors  
b) Copper conductors  
c) Aluminum conductors  
d) Any of the above
- 14) Voltage across the string is \_\_\_\_\_ times the line voltage  
a)  $\sqrt{3}$   
b)  $\sqrt{2}$   
c)  $1 / \sqrt{3}$   
d)  $1 / \sqrt{2}$

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System I**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any four** **16**
- a) Explain the following terms
    - i) Maximum demand
    - ii) Demand factor
    - iii) Diversity factor
    - iv) Load factor
  - b) Discuss the factors governing the choice of site selection for hydro power plant.
  - c) With the help of neat sketch explain gas turbine power plant.
  - d) Draw the Schematic Arrangement of Nuclear Power Station and explain.
  - e) Explain Base Load and Peak Load on Power Station.
- Q.3 Attempt any two.** **12**
- a) What are the different types of loads? Explain.
  - b) A generating station has a connected load of 43MW and a maximum demand of 20 MW; the units generated being  $61.5 \times 10^6$  per annum. Calculate
    - i) the demand factor and
    - ii) load factor
  - c) What is Tariff? Explain different types of Tariffs.

**Section - II**

- Q.4 Attempt any four** **16**
- a) Differentiate between overhead and underground system.
  - b) What are the methods improving String Efficiency?
  - c) Explain typical a. c. Power Supply Scheme.
  - d) Derive the equation for conductor material required in 2-wire d.c. system with one conductor earthed.
  - e) What are the different types of Commonly used conductor materials?
- Q.5 Attempt any two** **12**
- a) State and explain Kelvin's law to determine the economic size of Transmission conductor.
  - b) In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find
    - i) the distribution of voltage over 3 insulators and
    - ii) string efficiency
  - c) Derive the equation for conductor material required in Single phase, 2-wire a.c. system. Compare with 2 wire DC system.

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System I**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The knowledge of diversity factor helps in determining
 

|                    |                   |
|--------------------|-------------------|
| a) plant capacity  | b) Maximum demand |
| c) Units generated | d) Average load   |
- 2) Feeder is designed mainly from the point of view of \_\_\_\_\_.
 

|                                  |
|----------------------------------|
| a) Its current carrying capacity |
| b) Voltage drop in it            |
| c) Operating voltage             |
| d) Operating Frequency           |
- 3) A 3 phase 4 wire system is commonly used for \_\_\_\_\_.
 

|                         |                           |
|-------------------------|---------------------------|
| a) Primary distribution | b) Secondary distribution |
| c) Primary transmission | d) Secondary transmission |
- 4) The voltage of the single phase supply to residential consumers is
 

|          |          |
|----------|----------|
| a) 110 V | b) 210 V |
| c) 230 V | d) 400 V |
- 5) High voltage transmission lines use
 

|                          |                      |
|--------------------------|----------------------|
| a) suspension insulators | b) pin insulators    |
| c) both (a) and (b)      | d) none of the above |
- 6) Overhead lines generally use \_\_\_\_\_.
 

|                        |                      |
|------------------------|----------------------|
| a) A.C.S.R. conductors | b) Copper conductors |
| c) Aluminum conductors | d) Any of the above  |
- 7) Voltage across the string is \_\_\_\_\_ times the line voltage
 

|                   |                   |
|-------------------|-------------------|
| a) $\sqrt{3}$     | b) $\sqrt{2}$     |
| c) $1 / \sqrt{3}$ | d) $1 / \sqrt{2}$ |
- 8) Which of the following will take least time in starting from cold condition to full load operation
 

|                               |
|-------------------------------|
| a) Gas turbine plant          |
| b) Nuclear power plant        |
| c) Hydro electric power plant |
| d) Thermal power plant        |

- 9) Which of following generating plants has the minimum operating cost
  - a) Diesel plant
  - b) Hydroelectric plant
  - c) Steam plant
  - d) Nuclear plant
- 10) A gas turbine power plant is best suited for
  - a) Peak load
  - b) Base load
  - c) Emergency
  - d) None of these
- 11) A diesel power plant is generally used as a/an
  - a) Peak loads
  - b) Base load
  - c) Standby/emergency plant
  - d) Any of above
- 12) Which tariff is most ideal tariff for the consumer?
  - a) Two part tariff
  - b) Three part tariff
  - c) Both (a) and (b)
  - d) None of the above
- 13) Domestic consumers are charged \_\_\_\_\_.
  - a) Flat demand tariff
  - b) Block rate tariff
  - c) Flat rate tariff
  - d) Off peak tariff
- 14) Area under the daily load curve divided by 24 hours gives
  - a) Average load
  - b) Maximum demand
  - c) Units generated
  - d) Peak load



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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System I**

Day & Date: Friday, 17-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicate full marks.

**Section – I**

- Q.2 Attempt any four** **16**
- a) Explain the following terms
    - i) Maximum demand
    - ii) Demand factor
    - iii) Diversity factor
    - iv) Load factor
  - b) Discuss the factors governing the choice of site selection for hydro power plant.
  - c) With the help of neat sketch explain gas turbine power plant.
  - d) Draw the Schematic Arrangement of Nuclear Power Station and explain.
  - e) Explain Base Load and Peak Load on Power Station.
- Q.3 Attempt any two.** **12**
- a) What are the different types of loads? Explain.
  - b) A generating station has a connected load of 43MW and a maximum demand of 20 MW; the units generated being  $61.5 \times 10^6$  per annum. Calculate
    - i) the demand factor and
    - ii) load factor
  - c) What is Tariff? Explain different types of Tariffs.

**Section - II**

- Q.4 Attempt any four** **16**
- a) Differentiate between overhead and underground system.
  - b) What are the methods improving String Efficiency?
  - c) Explain typical a. c. Power Supply Scheme.
  - d) Derive the equation for conductor material required in 2-wire d.c. system with one conductor earthed.
  - e) What are the different types of Commonly used conductor materials?
- Q.5 Attempt any two** **12**
- a) State and explain Kelvin's law to determine the economic size of Transmission conductor.
  - b) In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find
    - i) the distribution of voltage over 3 insulators and
    - ii) string efficiency
  - c) Derive the equation for conductor material required in Single phase, 2-wire a.c. system. Compare with 2 wire DC system.

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System I**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The voltage of the single phase supply to residential consumers is
  - a) 110 V
  - b) 210 V
  - c) 230 V
  - d) 400 V
- 2) High voltage transmission lines use
  - a) suspension insulators
  - b) pin insulators
  - c) both (a) and (b)
  - d) none of the above
- 3) Overhead lines generally use \_\_\_\_\_.
  - a) A.C.S.R. conductors
  - b) Copper conductors
  - c) Aluminum conductors
  - d) Any of the above
- 4) Voltage across the string is \_\_\_\_\_ times the line voltage
  - a)  $\sqrt{3}$
  - b)  $\sqrt{2}$
  - c)  $1 / \sqrt{3}$
  - d)  $1 / \sqrt{2}$
- 5) Which of the following will take least time in starting from cold condition to full load operation
  - a) Gas turbine plant
  - b) Nuclear power plant
  - c) Hydro electric power plant
  - d) Thermal power plant
- 6) Which of following generating plants has the minimum operating cost
  - a) Diesel plant
  - b) Hydroelectric plant
  - c) Steam plant
  - d) Nuclear plant
- 7) A gas turbine power plant is best suited for
  - a) Peak load
  - b) Base load
  - c) Emergency
  - d) None of these
- 8) A diesel power plant is generally used as a/an
  - a) Peak loads
  - b) Base load
  - c) Standby/emergency plant
  - d) Any of above

- 9) Which tariff is most ideal tariff for the consumer?
  - a) Two part tariff
  - b) Three part tariff
  - c) Both (a) and (b)
  - d) None of the above
- 10) Domestic consumers are charged \_\_\_\_\_.
  - a) Flat demand tariff
  - b) Block rate tariff
  - c) Flat rate tariff
  - d) Off peak tariff
- 11) Area under the daily load curve divided by 24 hours gives
  - a) Average load
  - b) Maximum demand
  - c) Units generated
  - d) Peak load
- 12) The knowledge of diversity factor helps in determining
  - a) plant capacity
  - b) Maximum demand
  - c) Units generated
  - d) Average load
- 13) Feeder is designed mainly from the point of view of \_\_\_\_\_.
  - a) Its current carrying capacity
  - b) Voltage drop in it
  - c) Operating voltage
  - d) Operating Frequency
- 14) A 3 phase 4 wire system is commonly used for \_\_\_\_\_.
  - a) Primary distribution
  - b) Secondary distribution
  - c) Primary transmission
  - d) Secondary transmission

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System I**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four** **16**

- a) Explain the following terms
  - i) Maximum demand
  - ii) Demand factor
  - iii) Diversity factor
  - iv) Load factor
- b) Discuss the factors governing the choice of site selection for hydro power plant.
- c) With the help of neat sketch explain gas turbine power plant.
- d) Draw the Schematic Arrangement of Nuclear Power Station and explain.
- e) Explain Base Load and Peak Load on Power Station.

**Q.3 Attempt any two.** **12**

- a) What are the different types of loads? Explain.
- b) A generating station has a connected load of 43MW and a maximum demand of 20 MW; the units generated being  $61.5 \times 10^6$  per annum. Calculate
  - i) the demand factor and
  - ii) load factor
- c) What is Tariff? Explain different types of Tariffs.

**Section - II**

**Q.4 Attempt any four** **16**

- a) Differentiate between overhead and underground system.
- b) What are the methods improving String Efficiency?
- c) Explain typical a. c. Power Supply Scheme.
- d) Derive the equation for conductor material required in 2-wire d.c. system with one conductor earthed.
- e) What are the different types of Commonly used conductor materials?

**Q.5 Attempt any two** **12**

- a) State and explain Kelvin's law to determine the economic size of Transmission conductor.
- b) In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find
  - i) the distribution of voltage over 3 insulators and
  - ii) string efficiency
- c) Derive the equation for conductor material required in Single phase, 2-wire a.c. system. Compare with 2 wire DC system.

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**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System I**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book. Page No.3 (starting page of the Answer Book). Each question carry one mark.  
 2) Don't forget to mention Question Paper Set (P/Q/R/S) at the top of the same page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Domestic consumers are charged \_\_\_\_\_.  
 a) Flat demand tariff                      b) Block rate tariff  
 c) Flat rate tariff                              d) Off peak tariff
- 2) Area under the daily load curve divided by 24 hours gives  
 a) Average load                                  b) Maximum demand  
 c) Units generated                              d) Peak load
- 3) The knowledge of diversity factor helps in determining  
 a) plant capacity                                  b) Maximum demand  
 c) Units generated                              d) Average load
- 4) Feeder is designed mainly from the point of view of \_\_\_\_\_.  
 a) Its current carrying capacity  
 b) Voltage drop in it  
 c) Operating voltage  
 d) Operating Frequency
- 5) A 3 phase 4 wire system is commonly used for \_\_\_\_\_.  
 a) Primary distribution                      b) Secondary distribution  
 c) Primary transmission                      d) Secondary transmission
- 6) The voltage of the single phase supply to residential consumers is  
 a) 110 V                                              b) 210 V  
 c) 230 V                                              d) 400 V
- 7) High voltage transmission lines use  
 a) suspension insulators                      b) pin insulators  
 c) both (a) and (b)                              d) none of the above
- 8) Overhead lines generally use \_\_\_\_\_.  
 a) A.C.S.R. conductors                      b) Copper conductors  
 c) Aluminum conductors                      d) Any of the above
- 9) Voltage across the string is \_\_\_\_\_ times the line voltage  
 a)  $\sqrt{3}$                                               b)  $\sqrt{2}$   
 c)  $1/\sqrt{3}$                                               d)  $1/\sqrt{2}$

- 10)** Which of the following will take least time in starting from cold condition to full load operation
- a) Gas turbine plant
  - b) Nuclear power plant
  - c) Hydro electric power plant
  - d) Thermal power plant
- 11)** Which of following generating plants has the minimum operating cost
- a) Diesel plant
  - b) Hydroelectric plant
  - c) Steam plant
  - d) Nuclear plant
- 12)** A gas turbine power plant is best suited for
- a) Peak load
  - b) Base load
  - c) Emergency
  - d) None of these
- 13)** A diesel power plant is generally used as a/an
- a) Peak loads
  - b) Base load
  - c) Standby/emergency plant
  - d) Any of above
- 14)** Which tariff is most ideal tariff for the consumer?
- a) Two part tariff
  - b) Three part tariff
  - c) Both (a) and (b)
  - d) None of the above

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Set **S**

**S.Y. (B.Tech.) (Sem-I) (New) (CBCS) Examination: Oct/Nov - 2022**  
**ELECTRICAL ENGINEERING**  
**Power System I**

Day & Date: Friday, 17-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Attempt any four** **16**

- a) Explain the following terms
  - i) Maximum demand
  - ii) Demand factor
  - iii) Diversity factor
  - iv) Load factor
- b) Discuss the factors governing the choice of site selection for hydro power plant.
- c) With the help of neat sketch explain gas turbine power plant.
- d) Draw the Schematic Arrangement of Nuclear Power Station and explain.
- e) Explain Base Load and Peak Load on Power Station.

**Q.3 Attempt any two.** **12**

- a) What are the different types of loads? Explain.
- b) A generating station has a connected load of 43MW and a maximum demand of 20 MW; the units generated being  $61.5 \times 10^6$  per annum. Calculate
  - i) the demand factor and
  - ii) load factor
- c) What is Tariff? Explain different types of Tariffs.

**Section - II**

**Q.4 Attempt any four** **16**

- a) Differentiate between overhead and underground system.
- b) What are the methods improving String Efficiency?
- c) Explain typical a. c. Power Supply Scheme.
- d) Derive the equation for conductor material required in 2-wire d.c. system with one conductor earthed.
- e) What are the different types of Commonly used conductor materials?

**Q.5 Attempt any two** **12**

- a) State and explain Kelvin's law to determine the economic size of Transmission conductor.
- b) In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find
  - i) the distribution of voltage over 3 insulators and
  - ii) string efficiency
- c) Derive the equation for conductor material required in Single phase, 2-wire a.c. system. Compare with 2 wire DC system.

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electronic Devices and Circuits**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
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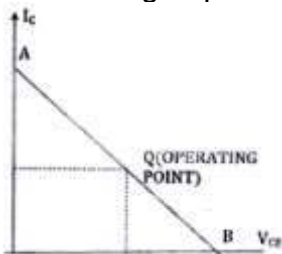
**MCQ/Objective Type Questions**

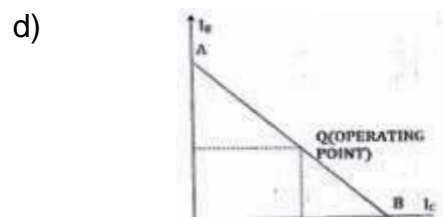
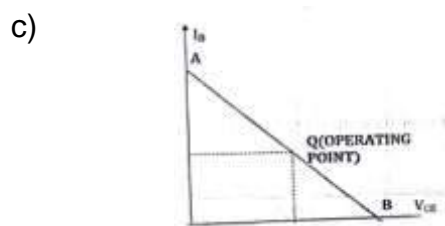
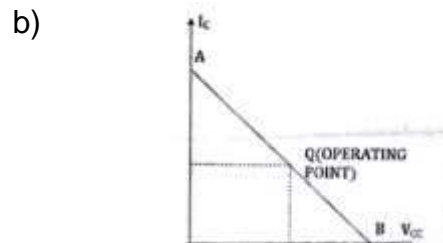
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) BJT is biased to \_\_\_\_\_.  
 a) Work as a switch  
 b) Prevent thermal runaway  
 c) Increase DC collector current  
 d) Operate it in the saturation region
- 2) Which of the following depicts the DC load line?  
 a) 



- 3) The Low frequency response of RC Coupled amplifier \_\_\_\_\_.  
 a) Increasing the value of coupling capacitor only  
 b) Increasing the value of bypass capacitor and coupling capacitor  
 c) Increasing the value of bypass capacitor only  
 d) Decreasing the value of coupling capacitor
- 4) RC coupling is used for \_\_\_\_\_ amplification.  
 a) Voltage  
 b) Current  
 c) Power  
 d) None of the above



- 5) In an RC coupled amplifier, the voltage gain over mid-frequency range \_\_\_\_\_.  
a) Changes abruptly with frequency  
b) Is constant  
c) Changes uniformly with frequency  
d) None of the above
- 6) How do we determine the hybrid parameters  $h_{11}$  and  $h_{21}$  of a two - port network?  
a) Short circuiting the input terminal  
b) Open circuiting the input terminal  
c) Short circuiting the output terminal  
d) Open circuiting the output terminal
- 7) MOSFET has greatest application in digital circuit due to \_\_\_\_\_.  
a) Low power consumption  
b) Less noise  
c) Small amount of space it takes on a chip  
d) All of the above
- 8) The change in output voltage for the corresponding change in load current in 7805 IC regulator is defined as \_\_\_\_\_.  
a) All of the mentioned  
b) Line regulation  
c) Load regulation  
d) Input regulation
- 9) Negative feedback in amplifier \_\_\_\_\_.  
a) Improves the signal-to-noise ratio at input  
b) Improves the signal-to-noise ratio at output  
c) Does not improve the signal-to-noise ratio at I/O  
d) Reduce Distortion
- 10) A feedback circuit usually employs which type of circuit?  
a) Resistive  
b) Inductive  
c) Capacitive  
d) Shunt
- 11) When a negative voltage feedback is applied to an amplifier, it's voltage gain is \_\_\_\_\_.  
a) increases  
b) reduces  
c) remains same  
d) none of above
- 12) Why do we use CE amplifier as a large signal class A amplifier?  
a) It has very high output impedance  
b) It has very high input impedance  
c) It has very high voltage gain  
d) It is very much stable
- 13) Where does the Q point lie for class B amplifier?  
a) Active  
b) Cut off  
c) Saturation  
d) Between saturation and active
- 14) What is cross over distortion?  
a) Effect occurred during switching of transistor after every half cycle  
b) Distortion occurred due to resistors  
c) Distortion occurred due to Capacitors  
d) Distortion occurred due to Inductors

Seat  
No.

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electronic Devices and Circuits**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four)**

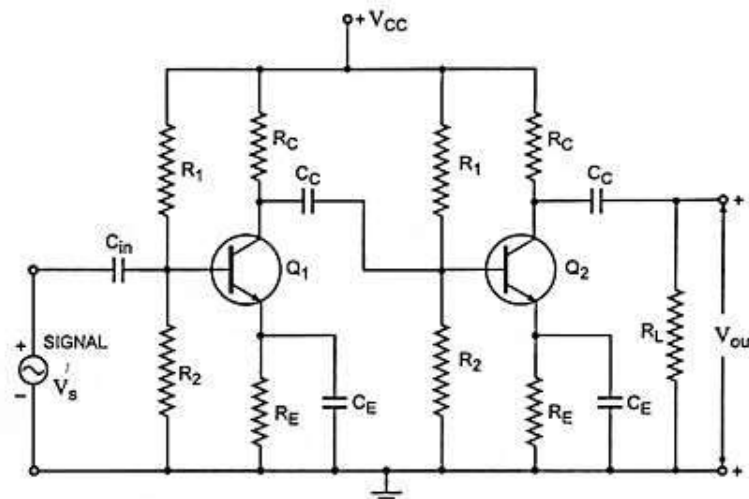
16

- Explain Hybrid model for Common CE Configuration.
- Explain the frequency response of RC coupled CE amplifier.
- Why biasing is needed in transistors.
- Explain the input and output characteristics of JFET.
- Explain Construction and working of E-MOSFET.

**Q.3 Answer the following question. (Any Two)**

12

- Explain the small signal parameters for Common Drain configuration of JFET.  $H_2$
- Explain - Thermal Runway, stability factor analysis for BJT.
- Analyze two stage RC coupled CE amplifier circuit (shown below) to determine Input Impedance, Output Impedance, and overall voltage gain.



Where  $R_1 = 120\text{K}\Omega$ ,  $R_2 = 39\text{K}\Omega$ ,  $R_C = 12\text{K}\Omega$ ,  $R_E = 3.9\text{K}\Omega$ ,  $h_{fe} = 100$ ,  $r_{e1} = 20\Omega$ ,  $R_L = 120\text{K}\Omega$

**Section – II**

- Q.4 Answer the following question. (Any Four)** **16**
- a) Explain 78xx and 79xx fixed voltage regulator with suitable diagram.
  - b) An amplifier with  $1\text{K}\Omega$  input resistance and  $50\text{K}\Omega$  output resistance has voltage gain of 40. The amplifier is now modified to provide 10% negative feedback in series with input.  
Calculate
    - 1) voltage gain
    - 2) input impedance
    - 3) output impedance
  - c) A voltage series negative feedback amplifier has voltage gain without feedback  $A_v = 500$ ,  $R_i = 3\text{K}\Omega$ ,  $R_o = 20\text{K}\Omega$ ,  $\beta = 0.01$ . Calculate overall voltage gain, input impedance and output impedance.
  - d) Explain the classification of power amplifier with current waveform in active device.
  - e) Derive the expression for efficiency of Class – A amplifier.
- Q.5 Answer the following question. (Any Two)** **12**
- a) Compare Class A, Class B and Class AB amplifier.
  - b) Explain the classification of negative feedback.
  - c) Explain various types of filters.

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electronic Devices and Circuits**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

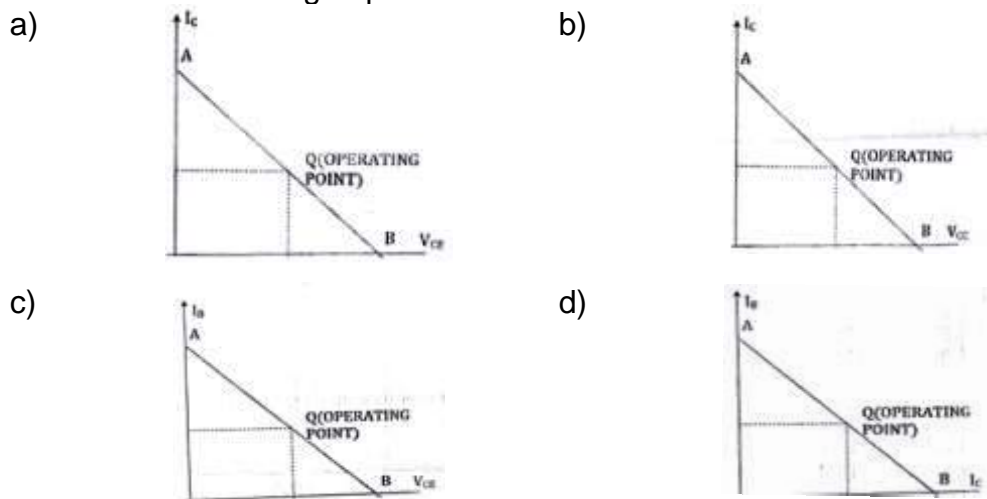
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The change in output voltage for the corresponding change in load current in 7805 IC regulator is defined as \_\_\_\_\_.  
 a) All of the mentioned                      b) Line regulation  
 c) Load regulation                          d) Input regulation
- 2) Negative feedback in amplifier \_\_\_\_\_.  
 a) Improves the signal-to-noise ratio at input  
 b) Improves the signal-to-noise ratio at output  
 c) Does not improve the signal-to-noise ratio at I/O  
 d) Reduce Distortion
- 3) A feedback circuit usually employs which type of circuit?  
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 c) Capacitive                                    d) Shunt
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- 6) Where does the Q point lie for class B amplifier?  
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- 8) BJT is biased to \_\_\_\_\_.  
 a) Work as a switch  
 b) Prevent thermal runaway  
 c) Increase DC collector current  
 d) Operate it in the saturation region
- 9) Which of the following depicts the DC load line?



- 10) The Low frequency response of RC Coupled amplifier \_\_\_\_\_.  
 a) Increasing the value of coupling capacitor only  
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- 13) How do we determine the hybrid parameters  $h_{11}$  and  $h_{21}$  of a two - port network?  
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 b) Less noise  
 c) Small amount of space it takes on a chip  
 d) All of the above

Seat  
No.

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electronic Devices and Circuits**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four)**

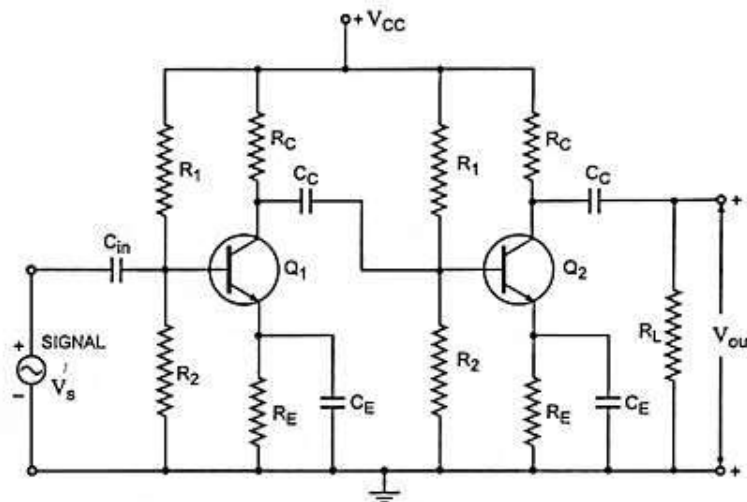
16

- Explain Hybrid model for Common CE Configuration.
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**Q.3 Answer the following question. (Any Two)**

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- Explain the small signal parameters for Common Drain configuration of JFET.  $H_2$
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- Analyze two stage RC coupled CE amplifier circuit (shown below) to determine Input Impedance, Output Impedance, and overall voltage gain.



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## Section – II

**Q.4 Answer the following question. (Any Four)** **16**

- a) Explain 78xx and 79xx fixed voltage regulator with suitable diagram.
- b) An amplifier with  $1\text{K}\Omega$  input resistance and  $50\text{K}\Omega$  output resistance has voltage gain of 40. The amplifier is now modified to provide 10% negative feedback in series with input.  
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**Q.5 Answer the following question. (Any Two)** **12**

- a) Compare Class A, Class B and Class AB amplifier.
- b) Explain the classification of negative feedback.
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**Seat  
No.**

Max. Marks: 70

- Instructions:**
- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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### MCQ/Objective Type Questions


Duration: 30 Minutes


Marks: 14

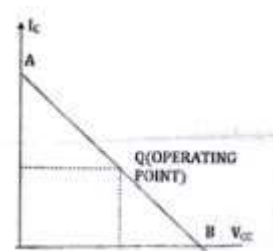
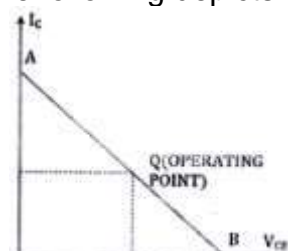
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14

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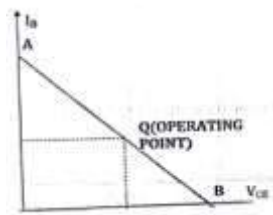
a)  


b)  


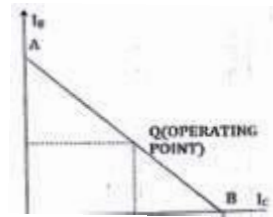




c)



d)



- 7) The Low frequency response of RC Coupled amplifier \_\_\_\_\_.  
 a) Increasing the value of coupling capacitor only  
 b) Increasing the value of bypass capacitor and coupling capacitor  
 c) Increasing the value of bypass capacitor only  
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Seat  
No.

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electronic Devices and Circuits**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four)**

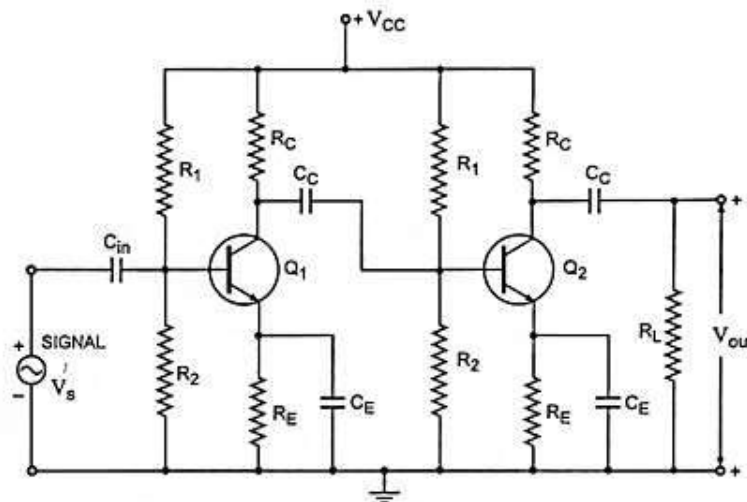
16

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**Q.3 Answer the following question. (Any Two)**

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- Explain the small signal parameters for Common Drain configuration of JFET.  $H_2$
- Explain - Thermal Runway, stability factor analysis for BJT.
- Analyze two stage RC coupled CE amplifier circuit (shown below) to determine Input Impedance, Output Impedance, and overall voltage gain.



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**Section – II**

**Q.4 Answer the following question. (Any Four)** **16**

- a) Explain 78xx and 79xx fixed voltage regulator with suitable diagram.
- b) An amplifier with  $1\text{K}\Omega$  input resistance and  $50\text{K}\Omega$  output resistance has voltage gain of 40. The amplifier is now modified to provide 10% negative feedback in series with input.  
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  - 1) voltage gain
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**Q.5 Answer the following question. (Any Two)** **12**

- a) Compare Class A, Class B and Class AB amplifier.
- b) Explain the classification of negative feedback.
- c) Explain various types of filters.

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Set **S**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electronic Devices and Circuits**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) How do we determine the hybrid parameters  $h_{11}$  and  $h_{21}$  of a two - port network?
  - a) Short circuiting the input terminal
  - b) Open circuiting the input terminal
  - c) Short circuiting the output terminal
  - d) Open circuiting the output terminal
- 2) MOSFET has greatest application in digital circuit due to \_\_\_\_\_.
  - a) Low power consumption
  - b) Less noise
  - c) Small amount of space it takes on a chip
  - d) All of the above
- 3) The change in output voltage for the corresponding change in load current in 7805 IC regulator is defined as \_\_\_\_\_.
 

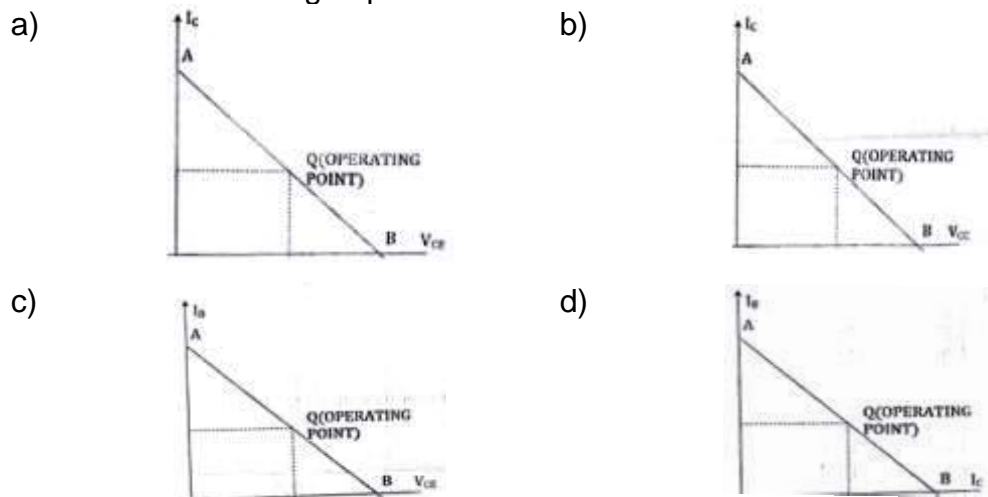
|                         |                     |
|-------------------------|---------------------|
| a) All of the mentioned | b) Line regulation  |
| c) Load regulation      | d) Input regulation |
- 4) Negative feedback in amplifier \_\_\_\_\_.
  - a) Improves the signal-to-noise ratio at input
  - b) Improves the signal-to-noise ratio at output
  - c) Does not improve the signal-to-noise ratio at I/O
  - d) Reduce Distortion
- 5) A feedback circuit usually employs which type of circuit?
 

|               |              |
|---------------|--------------|
| a) Resistive  | b) Inductive |
| c) Capacitive | d) Shunt     |
- 6) When a negative voltage feedback is applied to an amplifier, it's voltage gain is \_\_\_\_\_.
 

|                 |                  |
|-----------------|------------------|
| a) increases    | b) reduces       |
| c) remains same | d) none of above |

- 7) Why do we use CE amplifier as a large signal class A amplifier?
- It has very high output impedance
  - It has very high input impedance
  - It has very high voltage gain
  - It is very much stable
- 8) Where does the Q point lie for class B amplifier?
- Active
  - Cut off
  - Saturation
  - Between saturation and active
- 9) What is cross over distortion?
- Effect occurred during switching of transistor after every half cycle
  - Distortion occurred due to resistors
  - Distortion occurred due to Capacitors
  - Distortion occurred due to Inductors
- 10) BJT is biased to \_\_\_\_\_.  
  - Work as a switch
  - Prevent thermal runaway
  - Increase DC collector current
  - Operate it in the saturation region

- 11) Which of the following depicts the DC load line?



- 12) The Low frequency response of RC Coupled amplifier \_\_\_\_\_.  
  - Increasing the value of coupling capacitor only
  - Increasing the value of bypass capacitor and coupling capacitor
  - Increasing the value of bypass capacitor only
  - Decreasing the value of coupling capacitor
- 13) RC coupling is used for \_\_\_\_\_ amplification.  
  - Voltage
  - Current
  - Power
  - None of the above
- 14) In an RC coupled amplifier, the voltage gain over mid-frequency range \_\_\_\_\_.  
  - Changes abruptly with frequency
  - Is constant
  - Changes uniformly with frequency
  - None of the above

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electronic Devices and Circuits**

Day & Date: Monday, 20-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following question. (Any Four)**

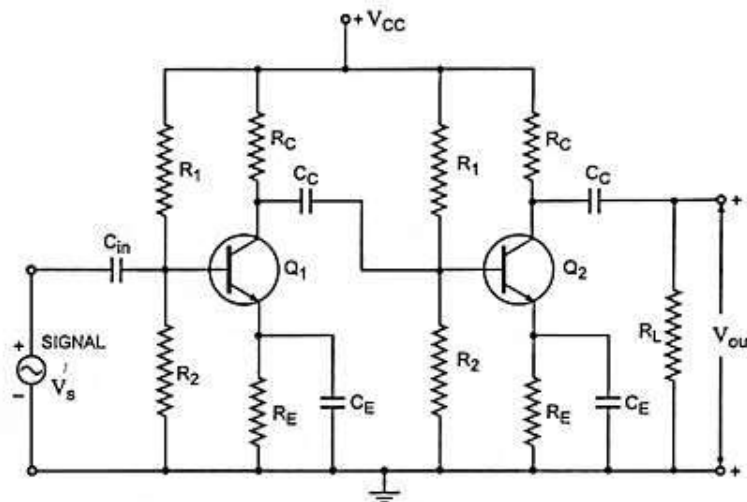
16

- Explain Hybrid model for Common CE Configuration.
- Explain the frequency response of RC coupled CE amplifier.
- Why biasing is needed in transistors.
- Explain the input and output characteristics of JFET.
- Explain Construction and working of E-MOSFET.

**Q.3 Answer the following question. (Any Two)**

12

- Explain the small signal parameters for Common Drain configuration of JFET.  $H_2$
- Explain - Thermal Runway, stability factor analysis for BJT.
- Analyze two stage RC coupled CE amplifier circuit (shown below) to determine Input Impedance, Output Impedance, and overall voltage gain.



Where  $R_1 = 120\text{K}\Omega$ ,  $R_2 = 39\text{K}\Omega$ ,  $R_C = 12\text{K}\Omega$ ,  $R_E = 3.9\text{K}\Omega$ ,  $h_{fe} = 100$ ,  $r_{e1} = 20\Omega$ ,  $R_L = 120\text{K}\Omega$

**Section – II**

**Q.4 Answer the following question. (Any Four)** **16**

- a) Explain 78xx and 79xx fixed voltage regulator with suitable diagram.
- b) An amplifier with  $1\text{K}\Omega$  input resistance and  $50\text{K}\Omega$  output resistance has voltage gain of 40. The amplifier is now modified to provide 10% negative feedback in series with input.  
Calculate
  - 1) voltage gain
  - 2) input impedance
  - 3) output impedance
- c) A voltage series negative feedback amplifier has voltage gain without feedback  $A_v = 500$ ,  $R_i = 3\text{K}\Omega$ ,  $R_o = 20\text{K}\Omega$ ,  $\beta = 0.01$ . Calculate overall voltage gain, input impedance and output impedance.
- d) Explain the classification of power amplifier with current waveform in active device.
- e) Derive the expression for efficiency of Class – A amplifier.

**Q.5 Answer the following question. (Any Two)** **12**

- a) Compare Class A, Class B and Class AB amplifier.
- b) Explain the classification of negative feedback.
- c) Explain various types of filters.

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Max. Marks: 70

Marks: 14

14

- Page 1 of 16



- 7) The Laplace transform of  $t \cosh t$  is \_\_\_\_\_.  
 a)  $\frac{s^2 - 1}{(s^2 + 1)^2}$  b)  $-\frac{s^2 - 1}{(s + 1)^2}$   
 c)  $\frac{s^2 + 1}{(s^2 - 1)^2}$  d)  $-\frac{s^2 + 1}{(s^2 - 1)^2}$
- 8) The value of  $\int_C \frac{(z+6) dz}{z^2-4}$  where  $C$  is the circle  $|z - 2| = 1$  is \_\_\_\_\_.  
 a)  $2\pi$  b)  $4\pi i$   
 c)  $2\pi i$  d)  $4\pi$
- 9)  $\int_C (y - x - 3x^2 i) dz$  where  $C$  is the straight line from  $z = 0$  to  $z = 1 + i$  is \_\_\_\_\_.  
 a)  $1 + i$  b)  $1 - i$   
 c)  $i$  d)  $-i$
- 10) If  $Z\{f(k)\} = F(z)$ , then  $Z\{kf(k)\}$  \_\_\_\_\_.  
 a)  $\frac{dF(z)}{dz}$  b)  $-\frac{dF(z)}{dz}$   
 c)  $z \frac{dF(z)}{dz}$  d)  $-z \frac{dF(z)}{dz}$
- 11) If  $\delta(k) = \begin{cases} 1, & k = 0 \\ 0, & \text{otherwise} \end{cases}$  then  $Z\{\delta(k)\} =$  \_\_\_\_\_.  
 a)  $0$  b)  $1$   
 c)  $Z$  d)  $1/z$
- 12) The ROC of Z-transform of the sequence  $F(k) = \begin{cases} (\frac{1}{2})^k, & k \leq 0 \\ (\frac{1}{3})^k, & k > 0 \end{cases}$  is \_\_\_\_\_.  
 a)  $|z| > \frac{1}{2}$  b)  $|z| > \frac{1}{3}$   
 c)  $2 < |z| < 3$  d)  $\frac{1}{3} < |z| < \frac{1}{2}$
- 13) The solution of the equation  $p q = p + q$  is \_\_\_\_\_.  
 a)  $z = ax + (a + 1) y + c$   
 b)  $z = (a + 1)x + a(a - 1) y + c$   
 c)  $z(a - 1) = a(a - 1)x + ay + c$   
 d)  $z = (a - 1)x + a(a + 1)y + c$
- 14)  $Z = a(x + y) + c$  is the general solution of \_\_\_\_\_.  
 a)  $P q = 1$  b)  $p = 1 - q$   
 c)  $P + q = 0$  d)  $p = q$

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.** **09**

- Solve  $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$
- $(D^3 + D)y = \cos x$ .
- Solve  $x^2 \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} + 5y = x^2 \sin(\log x)$
- Calculate  $L\{te^{-4t} \sin 3t\}$
- Calculate  $L\left\{\cos ht \int_0^t e^u \cdot \cos hu \, du\right\}$

**Q.3 Attempt any three of the following.** **09**

- Solve  $(D^2 + 3D + 2)y = \sin(e^x)$
- Solve  $(D^2 - 2D + 1)y = x \cdot e^x \sin x$ .
- Solve  $(5 + 2x)^2 \frac{d^2y}{dx^2} - 6(5 + 2x) \frac{dy}{dx} + 8y = 6x$
- Evaluate  $\int_0^\infty \frac{\cos at - \cos bt}{t} dt$
- Find the Laplace Transform of  $(1 + 2t - 3t^2 + 4t^3)H(t - 2)$

**Q.4 Attempt any two of the following.** **10**

- An e.m.f.  $E \sin pt$  is applied at  $t = 0$  to a circuit containing a condenser  $C$  and inductance  $L$  in series. The current  $X$  satisfies the equation  $L \frac{dx}{dt} + \frac{1}{c} \int X \, dt = E \sin pt$  where  $X = -\frac{dq}{dt}$ . If  $p^2 = \frac{1}{LC}$  and initially the current  $X$  and charge  $q$  are zero, find the current in the circuit at time  $t$ .
- Calculate inverse Laplace transform of  $\frac{s^2}{(s^2+4)(s^2+9)}$  by using Convolution Method.
- Solve  $(D^2 - D - 2)y = 2 \log x + \frac{1}{x} + \frac{1}{x^2}$

## Section – II

**Q.5 Attempt any three of the following.****09**

- a) Solve  $pq = x^m y^n z^{2l}$
- b) Solve  $p^2 q^3 = x^2 y^3$
- c) Evaluate  $\int_0^{1+i} (x - y + ix^2) dz$  along the straight line from  $z = 0$  to  $z = 1 + i$
- d) Calculate  $Z\{f(k)\}$  and the region of convergence of  $f(k) = k2^k, k \geq 0$
- e) Calculate  $Z\{f(k)\}$  and the region of convergence of  $f(k) = \left(\frac{1}{2}\right)^{|k|}$  for all  $k$ .

**Q.6 Attempt any three of the following.****09**

- a) Solve  $p(1 + q) = qz$ .
- b) Solve  $x(y - z)p + y(z - x)q = z(x - y)$
- c) Evaluate  $\oint \frac{z+2}{(z-3)(z-4)} dz$  where  $c$  is the circle  $|z| = 1$
- d) Calculate Z-Transform of  $f(k) = 2^k \sin\{3k + 2\}, k \geq 0$ .
- e) Calculate inverse Z-Transform of  $F(z) = \frac{1}{(z-5)^2}$  when  $|z| < 5$

**Q.7 Attempt any two****10**

- a) Evaluate  $\oint \frac{\sin^6 z}{(z-\pi/6)^3} dz$  where  $c$  is  $|z| = 1$ .
- b) Calculate inverse Z-Transform of  $F(z) = \frac{3z^2 - 18z + 26}{(z-2)(z-3)(z-4)}$ , if region of Convergence is  $3 < |z| < 4$
- c) Use variable separable method to solve  $\frac{\partial z}{\partial x} + 4 \frac{\partial z}{\partial y} = 0$  given  $z(0, y) = 8e^{-3y}$

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No.**

Max. Marks: 70

Marks: 14

14

- Page 5 of 16

- 6) The solution of the equation  $p q = p + q$  is \_\_\_\_\_.  
 a)  $z = ax + (a + 1)y + c$   
 b)  $z = (a + 1)x + a(a - 1)y + c$   
 c)  $z(a - 1) = a(a - 1)x + ay + c$   
 d)  $z = (a - 1)x + a(a + 1)y + c$
- 7)  $Z = a(x + y) + c$  is the general solution of \_\_\_\_\_.  
 a)  $P q = 1$   
 b)  $p = 1 - q$   
 c)  $P + q = 0$   
 d)  $p = q$
- 8) If the differential equation  $\frac{d^n y}{dx^n} + P_1 \frac{d^{n-1} y}{dx^{n-1}} + \dots + P_n y = X$  is a linear differential equation with constant coefficients then the R.H.S. is a \_\_\_\_\_.  
 a) Constant  
 b) function of  $x$   
 c) function of  $y$   
 d) function of  $x$  and  $y$
- 9)  $\frac{1}{D+1}(\log x + \frac{1}{x})$  is equal to \_\_\_\_\_.  
 a)  $e^x$   
 b)  $\log x$   
 c)  $x$   
 d)  $1$
- 10)  $y = (c_1 + c_2 x)e^{2x} + (c_3 + c_4 x)e^{-2x}$  is the general solutions of \_\_\_\_\_.  
 a)  $(D^2 + 2)^2 y = 0$   
 b)  $(D^2 - 2)^2 y = 0$   
 c)  $(D^2 + 4)^2 y = 0$   
 d)  $(D^2 - 4)^2 y = 0$
- 11) The particular integral of  $x^2 \frac{d^2 y}{dx^2} + 2x \frac{dy}{dx} = \frac{1}{x^2}$  is \_\_\_\_\_.  
 a)  $y = c_1 + c_2 x^2$   
 b)  $y = x - \frac{1}{x^2}$   
 c)  $y = \frac{1}{2x^2}$   
 d)  $y = \frac{1}{x^2}$
- 12) The general solution of  $(3x + 2)^2 \frac{d^2 y}{dx^2} + 5(3x + 2) \frac{dy}{dx} - 3y = 0$  is  $y =$  \_\_\_\_\_.  
 a)  $(c_1 + c_2 x)e^{2x}$   
 b)  $c_1 e^{2x} + c_2 e^{4x}$   
 c)  $c_1(3x + 2)^{1/3} + c_2(3x + 2)^{-1}$   
 d)  $c_1(x + 3)^2 + c_2(x + 3)^3$
- 13) If  $L[f(t)] = \phi(s)$ , then  $L[f(at)]$  is \_\_\_\_\_.  
 a)  $\phi(\frac{s}{a})$   
 b)  $\frac{1}{s} \phi(\frac{s}{a})$   
 c)  $\frac{1}{a} \phi[\frac{s}{a}]$   
 d)  $a. \phi(\frac{s}{a})$
- 14) The Laplace transform of  $t \cosh t$  is \_\_\_\_\_.  
 a)  $\frac{s^2 - 1}{(s^2 + 1)^2}$   
 b)  $-\frac{s^2 - 1}{(s + 1)^2}$   
 c)  $\frac{s^2 + 1}{(s^2 - 1)^2}$   
 d)  $-\frac{s^2 + 1}{(s^2 - 1)^2}$

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following. 09**

- Solve  $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$
- $(D^3 + D)y = \cos x$ .
- Solve  $x^2 \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} + 5y = x^2 \sin(\log x)$
- Calculate  $L\{te^{-4t} \sin 3t\}$
- Calculate  $L\left\{\cos ht \int_0^t e^u \cdot \cos hu \, du\right\}$

**Q.3 Attempt any three of the following. 09**

- Solve  $(D^2 + 3D + 2)y = \sin(e^x)$
- Solve  $(D^2 - 2D + 1)y = x \cdot e^x \sin x$ .
- Solve  $(5 + 2x)^2 \frac{d^2y}{dx^2} - 6(5 + 2x) \frac{dy}{dx} + 8y = 6x$
- Evaluate  $\int_0^\infty \frac{\cos at - \cos bt}{t} dt$
- Find the Laplace Transform of  $(1 + 2t - 3t^2 + 4t^3)H(t - 2)$

**Q.4 Attempt any two of the following. 10**

- An e.m.f.  $E \sin pt$  is applied at  $t = 0$  to a circuit containing a condenser  $C$  and inductance  $L$  in series. The current  $X$  satisfies the equation  $L \frac{dx}{dt} + \frac{1}{c} \int X \, dt = E \sin pt$  where  $X = -\frac{dq}{dt}$ . If  $p^2 = \frac{1}{LC}$  and initially the current  $X$  and charge  $q$  are zero, find the current in the circuit at time  $t$ .
- Calculate inverse Laplace transform of  $\frac{s^2}{(s^2+4)(s^2+9)}$  by using Convolution Method.
- Solve  $(D^2 - D - 2)y = 2 \log x + \frac{1}{x} + \frac{1}{x^2}$

## Section – II

**Q.5 Attempt any three of the following.****09**

- a) Solve  $pq = x^m y^n z^{2l}$
- b) Solve  $p^2 q^3 = x^2 y^3$
- c) Evaluate  $\int_0^{1+i} (x - y + ix^2) dz$  along the straight line from  $z = 0$  to  $z = 1 + i$
- d) Calculate  $Z\{f(k)\}$  and the region of convergence of  $f(k) = k2^k, k \geq 0$
- e) Calculate  $Z\{f(k)\}$  and the region of convergence of  $f(k) = \left(\frac{1}{2}\right)^{|k|}$  for all  $k$ .

**Q.6 Attempt any three of the following.****09**

- a) Solve  $p(1 + q) = qz$ .
- b) Solve  $x(y - z)p + y(z - x)q = z(x - y)$
- c) Evaluate  $\oint \frac{z+2}{(z-3)(z-4)} dz$  where  $c$  is the circle  $|z| = 1$
- d) Calculate Z-Transform of  $f(k) = 2^k \sin\{3k + 2\}, k \geq 0$ .
- e) Calculate inverse Z-Transform of  $F(z) = \frac{1}{(z-5)^2}$  when  $|z| < 5$

**Q.7 Attempt any two****10**

- a) Evaluate  $\oint \frac{\sin^6 z}{(z-\pi/6)^3} dz$  where  $c$  is  $|z| = 1$ .
- b) Calculate inverse Z-Transform of  $F(z) = \frac{3z^2 - 18z + 26}{(z-2)(z-3)(z-4)}$ , if region of Convergence is  $3 < |z| < 4$
- c) Use variable separable method to solve  $\frac{\partial z}{\partial x} + 4 \frac{\partial z}{\partial y} = 0$  given  $z(0, y) = 8e^{-3y}$

**Seat  
No.**

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Use of non-programmable calculator is allowed.

### MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) If  $\delta(k) = \begin{cases} 1, & k=0 \\ 0, & otherwise \end{cases}$  then  $Z\{\delta(k)\} =$  \_\_\_\_\_.

a) 0                                      b) 1  
c) Z                                        d)  $1/z$
- 2) The ROC of Z-transform of the sequence  $F(k) = \begin{cases} (\frac{1}{2})^k, & k \leq 0 \\ (\frac{1}{3})^k, & k > 0 \end{cases}$  is \_\_\_\_\_.

a)  $|z| > \frac{1}{2}$                                   b)  $|z| > \frac{1}{3}$   
c)  $2 < |z| < 3$                               d)  $\frac{1}{3} < |z| < \frac{1}{2}$
- 3) The solution of the equation  $p q = p + q$  is \_\_\_\_\_

a)  $z = ax + (a+1)y + c$   
b)  $z = (a+1)x + a(a-1)y + c$   
c)  $z(a-1) = a(a-1)x + ay + c$   
d)  $z = (a-1)x + a(a+1)y + c$
- 4)  $Z = a(x+y) + c$  is the general solution of \_\_\_\_\_.

a)  $Pq = 1$                                   b)  $p = 1 - q$   
c)  $P + q = 0$                                 d)  $p = q$
- 5) If the differential equation  $\frac{d^n y}{dx^n} + P_1 \frac{d^{n-1}y}{dx^{n-1}} + \dots + P_n y = X$  is a linear differential equation with constant coefficients then the R.H.S. is a \_\_\_\_\_.

a) Constant                                  b) function of x  
c) function of y                              d) function of x and y



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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.** **09**

- Solve  $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$
- $(D^3 + D)y = \cos x$ .
- Solve  $x^2 \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} + 5y = x^2 \sin(\log x)$
- Calculate  $L\{te^{-4t} \sin 3t\}$
- Calculate  $L\left\{\cos ht \int_0^t e^u \cdot \cos hu \, du\right\}$

**Q.3 Attempt any three of the following.** **09**

- Solve  $(D^2 + 3D + 2)y = \sin(e^x)$
- Solve  $(D^2 - 2D + 1)y = x \cdot e^x \sin x$ .
- Solve  $(5 + 2x)^2 \frac{d^2y}{dx^2} - 6(5 + 2x) \frac{dy}{dx} + 8y = 6x$
- Evaluate  $\int_0^\infty \frac{\cos at - \cos bt}{t} dt$
- Find the Laplace Transform of  $(1 + 2t - 3t^2 + 4t^3)H(t - 2)$

**Q.4 Attempt any two of the following.** **10**

- An e.m.f.  $E \sin pt$  is applied at  $t = 0$  to a circuit containing a condenser  $C$  and inductance  $L$  in series. The current  $X$  satisfies the equation  $L \frac{dx}{dt} + \frac{1}{c} \int X \, dt = E \sin pt$  where  $X = -\frac{dq}{dt}$ . If  $p^2 = \frac{1}{LC}$  and initially the current  $X$  and charge  $q$  are zero, find the current in the circuit at time  $t$ .
- Calculate inverse Laplace transform of  $\frac{s^2}{(s^2+4)(s^2+9)}$  by using Convolution Method.
- Solve  $(D^2 - D - 2)y = 2 \log x + \frac{1}{x} + \frac{1}{x^2}$

## Section – II

**Q.5 Attempt any three of the following.****09**

- a) Solve  $pq = x^m y^n z^{2l}$
- b) Solve  $p^2 q^3 = x^2 y^3$
- c) Evaluate  $\int_0^{1+i} (x - y + ix^2) dz$  along the straight line from  $z = 0$  to  $z = 1 + i$
- d) Calculate  $Z\{f(k)\}$  and the region of convergence of  $f(k) = k2^k, k \geq 0$
- e) Calculate  $Z\{f(k)\}$  and the region of convergence of  $f(k) = \left(\frac{1}{2}\right)^{|k|}$  for all  $k$ .

**Q.6 Attempt any three of the following.****09**

- a) Solve  $p(1 + q) = qz$ .
- b) Solve  $x(y - z)p + y(z - x)q = z(x - y)$
- c) Evaluate  $\oint \frac{z+2}{(z-3)(z-4)} dz$  where  $c$  is the circle  $|z| = 1$
- d) Calculate Z-Transform of  $f(k) = 2^k \sin\{3k + 2\}, k \geq 0$ .
- e) Calculate inverse Z-Transform of  $F(z) = \frac{1}{(z-5)^2}$  when  $|z| < 5$

**Q.7 Attempt any two****10**

- a) Evaluate  $\oint \frac{\sin^6 z}{(z-\pi/6)^3} dz$  where  $c$  is  $|z| = 1$ .
- b) Calculate inverse Z-Transform of  $F(z) = \frac{3z^2 - 18z + 26}{(z-2)(z-3)(z-4)}$ , if region of Convergence is  $3 < |z| < 4$
- c) Use variable separable method to solve  $\frac{\partial z}{\partial x} + 4 \frac{\partial z}{\partial y} = 0$  given  $z(0, y) = 8e^{-3y}$

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Set **S**

**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If  $L[f(t)] = \phi(s)$ , then  $L[f(at)]$  is \_\_\_\_\_.
  - a)  $\phi\left(\frac{s}{a}\right)$
  - b)  $\frac{1}{s}\phi\left(\frac{s}{a}\right)$
  - c)  $\frac{1}{a}\phi\left[\frac{s}{a}\right]$
  - d)  $a.\phi\left(\frac{s}{a}\right)$
- 2) The Laplace transform of  $t \cosh t$  is \_\_\_\_\_.
  - a)  $\frac{s^2 - 1}{(s^2 + 1)^2}$
  - b)  $-\frac{s^2 - 1}{(s + 1)^2}$
  - c)  $\frac{s^2 + 1}{(s^2 - 1)^2}$
  - d)  $-\frac{s^2 + 1}{(s^2 - 1)^2}$
- 3) The value of  $\int_c \frac{(z+6) dz}{z^2-4}$  where  $c$  is the circle  $|z - 2| = 1$  is \_\_\_\_\_.
  - a)  $2\pi$
  - b)  $4\pi i$
  - c)  $2\pi i$
  - d)  $4\pi$
- 4)  $\int_c (y - x - 3x^2 i) dz$  where  $c$  is the straight line from  $z = 0$  to  $z = 1 + i$  is \_\_\_\_\_.
  - a)  $1 + i$
  - b)  $1 - i$
  - c)  $i$
  - d)  $-i$
- 5) If  $Z\{f(k)\} = F(z)$ , then  $Z\{kf(k)\}$  \_\_\_\_\_.
  - a)  $\frac{dF(z)}{dz}$
  - b)  $-\frac{dF(z)}{dz}$
  - c)  $z \frac{dF(z)}{dz}$
  - d)  $-z \frac{dF(z)}{dz}$

- Page 14 of 16

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**S.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Engineering Mathematics – III**

Day & Date: Monday, 13-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Attempt any three of the following.** **09**

- Solve  $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$
- $(D^3 + D)y = \cos x$ .
- Solve  $x^2 \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} + 5y = x^2 \sin(\log x)$
- Calculate  $L\{te^{-4t} \sin 3t\}$
- Calculate  $L\left\{\cos ht \int_0^t e^u \cdot \cos hu \, du\right\}$

**Q.3 Attempt any three of the following.** **09**

- Solve  $(D^2 + 3D + 2)y = \sin(e^x)$
- Solve  $(D^2 - 2D + 1)y = x \cdot e^x \sin x$ .
- Solve  $(5 + 2x)^2 \frac{d^2y}{dx^2} - 6(5 + 2x) \frac{dy}{dx} + 8y = 6x$
- Evaluate  $\int_0^\infty \frac{\cos at - \cos bt}{t} dt$
- Find the Laplace Transform of  $(1 + 2t - 3t^2 + 4t^3)H(t - 2)$

**Q.4 Attempt any two of the following.** **10**

- An e.m.f.  $E \sin pt$  is applied at  $t = 0$  to a circuit containing a condenser  $C$  and inductance  $L$  in series. The current  $X$  satisfies the equation  $L \frac{dx}{dt} + \frac{1}{c} \int X \, dt = E \sin pt$  where  $X = -\frac{dq}{dt}$ . If  $p^2 = \frac{1}{LC}$  and initially the current  $X$  and charge  $q$  are zero, find the current in the circuit at time  $t$ .
- Calculate inverse Laplace transform of  $\frac{s^2}{(s^2+4)(s^2+9)}$  by using Convolution Method.
- Solve  $(D^2 - D - 2)y = 2 \log x + \frac{1}{x} + \frac{1}{x^2}$

## Section – II

**Q.5 Attempt any three of the following.****09**

- a) Solve  $pq = x^m y^n z^{2l}$
- b) Solve  $p^2 q^3 = x^2 y^3$
- c) Evaluate  $\int_0^{1+i} (x - y + ix^2) dz$  along the straight line from  $z = 0$  to  $z = 1 + i$
- d) Calculate  $Z\{f(k)\}$  and the region of convergence of  $f(k) = k2^k, k \geq 0$
- e) Calculate  $Z\{f(k)\}$  and the region of convergence of  $f(k) = \left(\frac{1}{2}\right)^{|k|}$  for all  $k$ .

**Q.6 Attempt any three of the following.****09**

- a) Solve  $p(1 + q) = qz$ .
- b) Solve  $x(y - z)p + y(z - x)q = z(x - y)$
- c) Evaluate  $\oint \frac{z+2}{(z-3)(z-4)} dz$  where  $c$  is the circle  $|z| = 1$
- d) Calculate Z-Transform of  $f(k) = 2^k \sin\{3k + 2\}, k \geq 0$ .
- e) Calculate inverse Z-Transform of  $F(z) = \frac{1}{(z-5)^2}$  when  $|z| < 5$

**Q.7 Attempt any two****10**

- a) Evaluate  $\oint \frac{\sin^6 z}{(z-\pi/6)^3} dz$  where  $c$  is  $|z| = 1$ .
- b) Calculate inverse Z-Transform of  $F(z) = \frac{3z^2 - 18z + 26}{(z-2)(z-3)(z-4)}$ , if region of Convergence is  $3 < |z| < 4$
- c) Use variable separable method to solve  $\frac{\partial z}{\partial x} + 4 \frac{\partial z}{\partial y} = 0$  given  $z(0, y) = 8e^{-3y}$

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**S.Y. (B.Tech) (Semester – II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Electrical Machines – II**

Day & Date: Monday, 06-03-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The synchronous speed of an induction motor is defined as \_\_\_\_\_.  
 a) Natural speed at which a magnetic field rotates  
 b) The speed of a synchronous motor  
 c) The speed of an induction motor at no load  
 d) None of these
- 2) Stator of a 3 ph induction motor produces \_\_\_\_\_ magnetic field.  
 a) Steady  
 b) Rotating  
 c) Alternating  
 d) None of the above
- 3) When load is placed on 3 phase induction motor, its slip \_\_\_\_\_.  
 a) increases  
 b) decreases  
 c) remains same  
 d) none of these
- 4) In case of 3 phase induction motor having  $N_s = 1500$  rpm and running with slip,  $s = 0.04$ , its rotor speed is \_\_\_\_\_ rpm  
 a) 1500  
 b) 0  
 c) 1440  
 d) 1560
- 5) Rotor rheostat control method of speed control is used for \_\_\_\_\_.  
 a) Squirrel-cage induction motors only  
 b) Slip ring induction motors only  
 c) Both a and b  
 d) None of the above
- 6) The disadvantage of starting an induction motor with a star-delta starter is that \_\_\_\_\_.  
 a) The starting torque is one-third of the torque in case of delta connection  
 b) During starting high losses result  
 c) The starting torque increases and the motor runs with jerks  
 d) None of these



- 7) Circle diagram of an induction motor can be used to determine its \_\_\_\_\_.
  - a) power factor
  - b) efficiency
  - c) slip
  - d) all of the above
- 8) Blocked rotor test is conducted at \_\_\_\_\_.
  - a) High voltage
  - b) Rated current
  - c) High current
  - d) Rated voltage
- 9) Starting winding of single phase induction motor is placed in the \_\_\_\_\_.
  - a) Stator
  - b) Rotor
  - c) Armature
  - d) Field
- 10) The direction of rotation of a single phase motor can be reversed by \_\_\_\_\_.
  - a) reversing connections of both windings
  - b) reversing connections of starting winding
  - c) using a reversing switch
  - d) reversing supply connections
- 11) The frequency of voltage generated by an alternator having 4 poles and rotating at 1800 rpm is \_\_\_\_\_ Hz.
  - a) 60
  - b) 7200
  - c) 120
  - d) 450
- 12) For the same power rating, a lower voltage alternator will be \_\_\_\_\_.
  - a) more efficient
  - b) larger in size
  - c) operating at high rpm
  - d) more costly
- 13) The back emf set up in the stator of a synchronous motor will depend on \_\_\_\_\_.
  - a) Rotor speed only
  - b) Rotor excitation only
  - c) Rotor excitation and rotor speed
  - d) Coupling angle, rotor speed and excitation
- 14) The field winding of a three phase synchronous machine is excited by \_\_\_\_\_.
  - a) Single-phase ac supply
  - b) Three-phase ac supply
  - c) DC supply
  - d) Supply obtained from an inverter

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**S.Y. (B.Tech) (Semester – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines – II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** - 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain principle of operation of 3 phase induction motor.
- b) A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50 Hz. Calculate:
  - i) the synchronous speed
  - ii) the speed of rotor when the slip is 0.05,
  - iii) the frequency of rotor currents when the slip is 0.03,
- c) What is the necessity of starter? Explain with diagram, working of DOL starter for a 3-phase induction motor.
- d) Explain how the speed is controlled by adding an external resistance in the rotor circuit.
- e) At standstill the equivalent impedance of inner and outer cages of a double cage rotor are  $(0.01 + j0.5) \Omega$  and  $(0.05 + j0.1) \Omega$  respectively. Calculate the ratio of torques produced by the two cages
  - i) at starting
  - ii) when running with a slip of 5%.
- f) Draw and explain equivalent circuit of 3ph Induction Motor.

**Q.3 Solve any Two** **12**

- a) Derive the expression for the torque of 3 phase induction motor. Also derive expression for starting torque and maximum torque.
- b) Prove that the rotating magnetic field is produced when 2 phase supply voltage is given to the stator winding of induction motor. Use phasor diagrams to support your answer.
- c) A 3 phase, 400 V induction motor gave the following test readings;  
 No load test: 400 V, 1250 W, 9 A  
 Blocked rotor test: 150 V, 4000 W, 38 A  
 Draw the circle diagram. If the normal rating is 14.9 kW, find from the circle diagram, the full load value of
  - i) current
  - ii) power factor
  - iii) slip
 Assume that stator Cu loss is equal to rotor Cu loss.

## Section – II

**Q.4 Solve any four****16**

- a) Explain why a single phase induction motor should be provided with an auxiliary winding on the stator.
- b) Draw and Explain capacitor start capacitor run induction motor.
- c) Explain the methods of synchronization of an alternator.
- d) A 3 ph, 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb, sinusoidally distributed and the speed is 375 rpm. Find the frequency and the phase and line emf. Assume full pitched coil &  $k_c = 1$ .
- e) A 1200 kVA, 3300 V, 50 Hz, three phase star connected alternator has armature resistance of  $0.25 \Omega$  per phase. A field current of 40 A produces a short circuit current of 200 A and an open circuit emf of 1100 V (line value). By using synchronous impedance method, find the voltage regulation at full load 0.8 p.f. lagging.
- f) Explain hunting effect of synchronous motor, also write down its causes and remedies.

**Q.5 Solve any Two****12**

- a) How to make single phase induction motor self starting? Explain cross field theory.
- b) 20 pole, 693 V, 50 Hz, 3 phase delta connected synchronous motor is operating at no load with normal excitation. It has armature resistance per phase of zero and synchronous reactance of  $10 \Omega$ . If rotor is retarded by  $0.5^\circ$  (mechanical) from its synchronous position. Calculate:
  - i) rotor displacement in electrical degrees
  - ii) armature emf per phase
  - iii) armature current per phase
  - iv) power drawn by the motor
- c) With neat sketch explain the construction and working principle of an alternator.

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**S.Y. (B.Tech) (Semester – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines – II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Blocked rotor test is conducted at \_\_\_\_\_.
  - a) High voltage
  - b) Rated current
  - c) High current
  - d) Rated voltage
- 2) Starting winding of single phase induction motor is placed in the \_\_\_\_\_.
  - a) Stator
  - b) Rotor
  - c) Armature
  - d) Field
- 3) The direction of rotation of a single phase motor can be reversed by \_\_\_\_\_.
  - a) reversing connections of both windings
  - b) reversing connections of starting winding
  - c) using a reversing switch
  - d) reversing supply connections
- 4) The frequency of voltage generated by an alternator having 4 poles and rotating at 1800 rpm is \_\_\_\_\_ Hz.
  - a) 60
  - b) 7200
  - c) 120
  - d) 450
- 5) For the same power rating, a lower voltage alternator will be \_\_\_\_\_.
  - a) more efficient
  - b) larger in size
  - c) operating at high rpm
  - d) more costly
- 6) The back emf set up in the stator of a synchronous motor will depend on \_\_\_\_\_.
  - a) Rotor speed only
  - b) Rotor excitation only
  - c) Rotor excitation and rotor speed
  - d) Coupling angle, rotor speed and excitation
- 7) The field winding of a three phase synchronous machine is excited by \_\_\_\_\_.
  - a) Single-phase ac supply
  - b) Three-phase ac supply
  - c) DC supply
  - d) Supply obtained from an inverter

- 8) The synchronous speed of an induction motor is defined as \_\_\_\_\_.  
a) Natural speed at which a magnetic field rotates  
b) The speed of a synchronous motor  
c) The speed of an induction motor at no load  
d) None of these
- 9) Stator of a 3 ph induction motor produces \_\_\_\_\_ magnetic field.  
a) Steady  
b) Rotating  
c) Alternating  
d) None of the above
- 10) When load is placed on 3 phase induction motor, its slip \_\_\_\_\_.  
a) increases  
b) decreases  
c) remains same  
d) none of these
- 11) In case of 3 phase induction motor having  $N_s = 1500$  rpm and running with slip,  $s = 0.04$ , its rotor speed is \_\_\_\_\_ rpm  
a) 1500  
b) 0  
c) 1440  
d) 1560
- 12) Rotor rheostat control method of speed control is used for \_\_\_\_\_.  
a) Squirrel-cage induction motors only  
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c) Both a and b  
d) None of the above
- 13) The disadvantage of starting an induction motor with a star-delta starter is that \_\_\_\_\_.  
a) The starting torque is one-third of the torque in case of delta connection  
b) During starting high losses result  
c) The starting torque increases and the motor runs with jerks  
d) None of these
- 14) Circle diagram of an induction motor can be used to determine its \_\_\_\_\_.  
a) power factor  
b) efficiency  
c) slip  
d) all of the above

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**S.Y. (B.Tech) (Semester – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines – II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** - 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain principle of operation of 3 phase induction motor.
- b) A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50 Hz. Calculate:
  - i) the synchronous speed
  - ii) the speed of rotor when the slip is 0.05,
  - iii) the frequency of rotor currents when the slip is 0.03,
- c) What is the necessity of starter? Explain with diagram, working of DOL starter for a 3-phase induction motor.
- d) Explain how the speed is controlled by adding an external resistance in the rotor circuit.
- e) At standstill the equivalent impedance of inner and outer cages of a double cage rotor are  $(0.01 + j0.5) \Omega$  and  $(0.05 + j0.1) \Omega$  respectively. Calculate the ratio of torques produced by the two cages
  - i) at starting
  - ii) when running with a slip of 5%.
- f) Draw and explain equivalent circuit of 3ph Induction Motor.

**Q.3 Solve any Two** **12**

- a) Derive the expression for the torque of 3 phase induction motor. Also derive expression for starting torque and maximum torque.
- b) Prove that the rotating magnetic field is produced when 2 phase supply voltage is given to the stator winding of induction motor. Use phasor diagrams to support your answer.
- c) A 3 phase, 400 V induction motor gave the following test readings;  
 No load test: 400 V, 1250 W, 9 A  
 Blocked rotor test: 150 V, 4000 W, 38 A  
 Draw the circle diagram. If the normal rating is 14.9 kW, find from the circle diagram, the full load value of
  - i) current
  - ii) power factor
  - iii) slip
 Assume that stator  $C_u$  loss is equal to rotor  $C_u$  loss.

## Section – II

**Q.4 Solve any four****16**

- a) Explain why a single phase induction motor should be provided with an auxiliary winding on the stator.
- b) Draw and Explain capacitor start capacitor run induction motor.
- c) Explain the methods of synchronization of an alternator.
- d) A 3 ph, 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb, sinusoidally distributed and the speed is 375 rpm. Find the frequency and the phase and line emf. Assume full pitched coil &  $k_c = 1$ .
- e) A 1200 kVA, 3300 V, 50 Hz, three phase star connected alternator has armature resistance of  $0.25 \Omega$  per phase. A field current of 40 A produces a short circuit current of 200 A and an open circuit emf of 1100 V (line value). By using synchronous impedance method, find the voltage regulation at full load 0.8 p.f. lagging.
- f) Explain hunting effect of synchronous motor, also write down its causes and remedies.

**Q.5 Solve any Two****12**

- a) How to make single phase induction motor self starting? Explain cross field theory.
- b) 20 pole, 693 V, 50 Hz, 3 phase delta connected synchronous motor is operating at no load with normal excitation. It has armature resistance per phase of zero and synchronous reactance of  $10 \Omega$ . If rotor is retarded by  $0.5^\circ$  (mechanical) from its synchronous position. Calculate:
  - i) rotor displacement in electrical degrees
  - ii) armature emf per phase
  - iii) armature current per phase
  - iv) power drawn by the motor
- c) With neat sketch explain the construction and working principle of an alternator.

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**S.Y. (B.Tech) (Semester – II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Electrical Machines – II**

Day & Date: Monday, 06-03-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The frequency of voltage generated by an alternator having 4 poles and rotating at 1800 rpm is \_\_\_\_\_ Hz.
  - a) 60
  - b) 7200
  - c) 120
  - d) 450
- 2) For the same power rating, a lower voltage alternator will be \_\_\_\_\_.
  - a) more efficient
  - b) larger in size
  - c) operating at high rpm
  - d) more costly
- 3) The back emf set up in the stator of a synchronous motor will depend on \_\_\_\_\_.
  - a) Rotor speed only
  - b) Rotor excitation only
  - c) Rotor excitation and rotor speed
  - d) Coupling angle, rotor speed and excitation
- 4) The field winding of a three phase synchronous machine is excited by \_\_\_\_\_.
  - a) Single-phase ac supply
  - b) Three-phase ac supply
  - c) DC supply
  - d) Supply obtained from an inverter
- 5) The synchronous speed of an induction motor is defined as \_\_\_\_\_.
  - a) Natural speed at which a magnetic field rotates
  - b) The speed of a synchronous motor
  - c) The speed of an induction motor at no load
  - d) None of these
- 6) Stator of a 3 ph induction motor produces \_\_\_\_\_ magnetic field.
  - a) Steady
  - b) Rotating
  - c) Alternating
  - d) None of the above
- 7) When load is placed on 3 phase induction motor, its slip \_\_\_\_\_.
  - a) increases
  - b) decreases
  - c) remains same
  - d) none of these





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**S.Y. (B.Tech) (Semester – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines – II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** - 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain principle of operation of 3 phase induction motor.
- b) A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50 Hz. Calculate:
  - i) the synchronous speed
  - ii) the speed of rotor when the slip is 0.05,
  - iii) the frequency of rotor currents when the slip is 0.03,
- c) What is the necessity of starter? Explain with diagram, working of DOL starter for a 3-phase induction motor.
- d) Explain how the speed is controlled by adding an external resistance in the rotor circuit.
- e) At standstill the equivalent impedance of inner and outer cages of a double cage rotor are  $(0.01 + j0.5) \Omega$  and  $(0.05 + j0.1) \Omega$  respectively. Calculate the ratio of torques produced by the two cages
  - i) at starting
  - ii) when running with a slip of 5%.
- f) Draw and explain equivalent circuit of 3ph Induction Motor.

**Q.3 Solve any Two** **12**

- a) Derive the expression for the torque of 3 phase induction motor. Also derive expression for starting torque and maximum torque.
- b) Prove that the rotating magnetic field is produced when 2 phase supply voltage is given to the stator winding of induction motor. Use phasor diagrams to support your answer.
- c) A 3 phase, 400 V induction motor gave the following test readings;  
 No load test: 400 V, 1250 W, 9 A  
 Blocked rotor test: 150 V, 4000 W, 38 A  
 Draw the circle diagram. If the normal rating is 14.9 kW, find from the circle diagram, the full load value of
  - i) current
  - ii) power factor
  - iii) slip
 Assume that stator  $Cu$  loss is equal to rotor  $Cu$  loss.

## Section – II

## Q.4 Solve any four

16

- a) Explain why a single phase induction motor should be provided with an auxiliary winding on the stator.
- b) Draw and Explain capacitor start capacitor run induction motor.
- c) Explain the methods of synchronization of an alternator.
- d) A 3 ph, 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb, sinusoidally distributed and the speed is 375 rpm. Find the frequency and the phase and line emf. Assume full pitched coil &  $k_c = 1$ .
- e) A 1200 kVA, 3300 V, 50 Hz, three phase star connected alternator has armature resistance of  $0.25 \Omega$  per phase. A field current of 40 A produces a short circuit current of 200 A and an open circuit emf of 1100 V (line value). By using synchronous impedance method, find the voltage regulation at full load 0.8 p.f. lagging.
- f) Explain hunting effect of synchronous motor, also write down its causes and remedies.

## Q.5 Solve any Two

12

- a) How to make single phase induction motor self starting? Explain cross field theory.
- b) 20 pole, 693 V, 50 Hz, 3 phase delta connected synchronous motor is operating at no load with normal excitation. It has armature resistance per phase of zero and synchronous reactance of  $10 \Omega$ . If rotor is retarded by  $0.5^\circ$  (mechanical) from its synchronous position. Calculate:
  - i) rotor displacement in electrical degrees
  - ii) armature emf per phase
  - iii) armature current per phase
  - iv) power drawn by the motor
- c) With neat sketch explain the construction and working principle of an alternator.

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**S.Y. (B.Tech) (Semester – II) (New) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Electrical Machines – II**

Day & Date: Monday, 06-03-2023

Max. Marks: 70

Time: 02:00 PM To 05:00 PM

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The disadvantage of starting an induction motor with a star-delta starter is that \_\_\_\_\_.
  - a) The starting torque is one-third of the torque in case of delta connection
  - b) During starting high losses result
  - c) The starting torque increases and the motor runs with jerks
  - d) None of these
- 2) Circle diagram of an induction motor can be used to determine its \_\_\_\_\_.
  - a) power factor
  - b) efficiency
  - c) slip
  - d) all of the above
- 3) Blocked rotor test is conducted at \_\_\_\_\_.
  - a) High voltage
  - b) Rated current
  - c) High current
  - d) Rated voltage
- 4) Starting winding of single phase induction motor is placed in the \_\_\_\_\_.
  - a) Stator
  - b) Rotor
  - c) Armature
  - d) Field
- 5) The direction of rotation of a single phase motor can be reversed by \_\_\_\_\_.
  - a) reversing connections of both windings
  - b) reversing connections of starting winding
  - c) using a reversing switch
  - d) reversing supply connections
- 6) The frequency of voltage generated by an alternator having 4 poles and rotating at 1800 rpm is \_\_\_\_\_ Hz.
  - a) 60
  - b) 7200
  - c) 120
  - d) 450
- 7) For the same power rating, a lower voltage alternator will be \_\_\_\_\_.
  - a) more efficient
  - b) larger in size
  - c) operating at high rpm
  - d) more costly

- 8) The back emf set up in the stator of a synchronous motor will depend on \_\_\_\_\_.  
a) Rotor speed only  
b) Rotor excitation only  
c) Rotor excitation and rotor speed  
d) Coupling angle, rotor speed and excitation
- 9) The field winding of a three phase synchronous machine is excited by \_\_\_\_\_.  
a) Single-phase ac supply  
b) Three-phase ac supply  
c) DC supply  
d) Supply obtained from an inverter
- 10) The synchronous speed of an induction motor is defined as \_\_\_\_\_.  
a) Natural speed at which a magnetic field rotates  
b) The speed of a synchronous motor  
c) The speed of an induction motor at no load  
d) None of these
- 11) Stator of a 3 ph induction motor produces \_\_\_\_\_ magnetic field.  
a) Steady  
b) Rotating  
c) Alternating  
d) None of the above
- 12) When load is placed on 3 phase induction motor, its slip \_\_\_\_\_.  
a) increases  
b) decreases  
c) remains same  
d) none of these
- 13) In case of 3 phase induction motor having  $N_s = 1500$  rpm and running with slip,  $s = 0.04$ , its rotor speed is \_\_\_\_\_ rpm  
a) 1500  
b) 0  
c) 1440  
d) 1560
- 14) Rotor rheostat control method of speed control is used for \_\_\_\_\_.  
a) Squirrel-cage induction motors only  
b) Slip ring induction motors only  
c) Both a and b  
d) None of the above

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**S.Y. (B.Tech) (Semester – II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines – II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** - 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Explain principle of operation of 3 phase induction motor.
- b) A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50 Hz. Calculate:
  - i) the synchronous speed
  - ii) the speed of rotor when the slip is 0.05,
  - iii) the frequency of rotor currents when the slip is 0.03,
- c) What is the necessity of starter? Explain with diagram, working of DOL starter for a 3-phase induction motor.
- d) Explain how the speed is controlled by adding an external resistance in the rotor circuit.
- e) At standstill the equivalent impedance of inner and outer cages of a double cage rotor are  $(0.01 + j0.5) \Omega$  and  $(0.05 + j0.1) \Omega$  respectively. Calculate the ratio of torques produced by the two cages
  - i) at starting
  - ii) when running with a slip of 5%.
- f) Draw and explain equivalent circuit of 3ph Induction Motor.

**Q.3 Solve any Two** **12**

- a) Derive the expression for the torque of 3 phase induction motor. Also derive expression for starting torque and maximum torque.
- b) Prove that the rotating magnetic field is produced when 2 phase supply voltage is given to the stator winding of induction motor. Use phasor diagrams to support your answer.
- c) A 3 phase, 400 V induction motor gave the following test readings;  
 No load test: 400 V, 1250 W, 9 A  
 Blocked rotor test: 150 V, 4000 W, 38 A  
 Draw the circle diagram. If the normal rating is 14.9 kW, find from the circle diagram, the full load value of
  - i) current
  - ii) power factor
  - iii) slip
 Assume that stator  $C_u$  loss is equal to rotor  $C_u$  loss.

## Section – II

**Q.4 Solve any four****16**

- a) Explain why a single phase induction motor should be provided with an auxiliary winding on the stator.
- b) Draw and Explain capacitor start capacitor run induction motor.
- c) Explain the methods of synchronization of an alternator.
- d) A 3 ph, 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb, sinusoidally distributed and the speed is 375 rpm. Find the frequency and the phase and line emf. Assume full pitched coil &  $k_c = 1$ .
- e) A 1200 kVA, 3300 V, 50 Hz, three phase star connected alternator has armature resistance of  $0.25 \Omega$  per phase. A field current of 40 A produces a short circuit current of 200 A and an open circuit emf of 1100 V (line value). By using synchronous impedance method, find the voltage regulation at full load 0.8 p.f. lagging.
- f) Explain hunting effect of synchronous motor, also write down its causes and remedies.

**Q.5 Solve any Two****12**

- a) How to make single phase induction motor self starting? Explain cross field theory.
- b) 20 pole, 693 V, 50 Hz, 3 phase delta connected synchronous motor is operating at no load with normal excitation. It has armature resistance per phase of zero and synchronous reactance of  $10 \Omega$ . If rotor is retarded by  $0.5^\circ$  (mechanical) from its synchronous position. Calculate:
  - i) rotor displacement in electrical degrees
  - ii) armature emf per phase
  - iii) armature current per phase
  - iv) power drawn by the motor
- c) With neat sketch explain the construction and working principle of an alternator.

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Corona is accompanied by \_\_\_\_\_.  
a) violet visible glow                      b) hissing noise  
c) formation of ozone gas                  d) all of the above
- 2) Corona usually occurs when the electrostatic stress in the air around the conductor succeeds \_\_\_\_\_.  
a) 30 kV (maximum value)/cm              b) 22 kV (maximum value)/cm  
c) 11 kV (rms value)/cm                      d) 6.6 kV (rms value)/cm
- 3) The sag of transmission line is least affected owing to \_\_\_\_\_.  
a) Weight of conductor                      b) Current through the conductor  
c) Temperature                                d) Ice deposited on the conductor
- 4) In a cable immediately above metallic sheath \_\_\_\_\_ is provided.  
a) Earthing connection                      b) Bedding  
c) Armouring                                    d) None of the above
- 5) The process of achieving uniformity in the dielectric stress by using layers of different dielectrics is known as \_\_\_\_\_.  
a) Stranding process                          b) Grading of cables  
c) Stress distribution                          d) Capacitance grading
- 6) The thickness of the layer of insulation on the conductor, in cables, depends upon \_\_\_\_\_.  
a) Reactive power                              b) Power factor  
c) Voltage                                        d) Current carrying capacity
- 7) By using which conductor is the skin effect reduced?  
a) Bundled conductors                        b) Stranded conductors  
c) Hollow conductors                          d) Solid conductors
- 8) Which of the following is correct operating voltage range for short transmission lines?  
a) Less than 456 KV                            b) Less than 132 KV  
c) Less than 20 KV                              d) Less than 100 KV



- 9) In any transmission line  $AD-BC = \underline{\hspace{2cm}}$ ?  
a) 1  
b) 0  
c) 2  
d) 3
- 10) The values of A, B, C and D constants for a short transmission line are respectively \_\_\_\_\_  
a) Z, 0, 1 and 1  
b) 0, 1, 1 and Z  
c) 1, Z, 0 and 1  
d) 1, 1, Z and 0
- 11) Feeder is designed mainly from the point of view of \_\_\_\_\_.  
a) Its current carrying capacity  
b) Voltage drop in it  
c) Operating voltage  
d) Operating Frequency
- 12) Which of the following distribution systems is more reliable?  
a) Radial system  
b) Tree system  
c) Ring main system  
d) All are equally reliable
- 13) In a substation the following equipment is not installed \_\_\_\_\_  
a) Exciters  
b) Series capacitors  
c) Shunt reactors  
d) Voltage transformers
- 14) Which of the following are the methods of grounding?  
a) Resistance  
b) Reactance  
c) Solid  
d) All of these

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Attempt any four.**

16

- Explain phenomenon of corona with advantages and disadvantages.
- A single core cable has a conductor diameter of 2.5 cm & insulation of thickness of 1.2 cm. If the specific resistance of insulation is  $4.5 \times 10^{14} \Omega \text{ cm}$ , calculate the insulation resistance per kilometre length of cable.
- Explain the concept of GMR & GMD.
- An overhead line has a span of 260 m, the weight of the line conductor is 0.68 kg per meter run. Calculate the value of maximum sag in the line if the maximum allowable tension in the line is 1550 kg.
- Explain in detail skin effect & proximity effect.
- Derive the expression for capacitance of single core cable.

**Q.3 Attempt any two.**

12

- An overhead transmission line at a river crossing is supported from two towers at heights of 40m and 90m above water level, the horizontal distance between the towers being 400m. If the maximum allowable tension is 2000kg. Find the clearance between the conductor and water at a point mid-way between the towers. Weight of conductor is 1kg/m.
- Derive the expression for inductance of single phase two wire line.
- Explain the following methods of cable grading:
  - Capacitance grading
  - Intersheath grading

**Section – II**

**Q.4 Attempt any four.**

16

- Derive an expression for voltage regulation and efficiency of short transmission line along with the equivalent circuit and phasor diagram.
- Explain different equipment used in substation.
- Write short note on connection schemes of distribution systems.
- A 3-phase, 50Hz, 150 km line has a resistance, inductive reactance and capacitive shunt admittance of  $0.1 \Omega$ ,  $0.5 \Omega$  and  $3 \times 10^{-6} \text{ S}$  per km per phase. If the line delivers 50 MW at 110 kV and 0.8 p.f. lagging, determine the sending end voltage and current. Assume a nominal  $\pi$  circuit for the line.
- Draw and explain concentrated loaded DC distributor fed at one end.
- Write short note on resistance & reactance grounding.

**Q.5 Attempt any two:**

- 1) A single phase overhead transmission line delivers 1100 kW at 33KV at 0.8p.f lagg. The total resistance and inductive reactance of the line are  $10\Omega$  and  $15\Omega$  respectively.  
Determine:
  - i) Sending end voltage
  - ii) Sending end power factor
  - iii) Transmission Efficiency
- 2) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal T method.
- 3) A 2 wire dc distributor 600 m long as loaded as under:  
Distance from A in meters: 150   300   350   450  
Loads in amperes:                100   200   250   300  
The feeding point A is maintained at 440 V and that of B at 430 V. If each conductor has a resistance of 0.01 ohm per 100 m.  
Calculate:
  - i) the current supplied from A to B
  - ii) the power dissipated in the distributor

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which of the following is correct operating voltage range for short transmission lines?
 

|                     |                     |
|---------------------|---------------------|
| a) Less than 456 KV | b) Less than 132 KV |
| c) Less than 20 KV  | d) Less than 100 KV |
- 2) In any transmission line  $AD-BC = \underline{\hspace{2cm}}$ ?
 

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| a) 1 | b) 0 |
| c) 2 | d) 3 |
- 3) The values of A, B, C and D constants for a short transmission line are respectively \_\_\_\_\_
 

|                  |                  |
|------------------|------------------|
| a) Z, 0, 1 and 1 | b) 0, 1, 1 and Z |
| c) 1, Z, 0 and 1 | d) 1, 1, Z and O |
- 4) Feeder is designed mainly from the point of view of \_\_\_\_\_.
 

|                                  |                        |
|----------------------------------|------------------------|
| a) Its current carrying capacity | b) Voltage drop in it  |
| c) Operating voltage             | d) Operating Frequency |
- 5) Which of the following distribution systems is more reliable?
 

|                     |                             |
|---------------------|-----------------------------|
| a) Radial system    | b) Tree system              |
| c) Ring main system | d) All are equally reliable |
- 6) In a substation the following equipment is not installed \_\_\_\_\_.
 

|                   |                         |
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| a) Exciters       | b) Series capacitors    |
| c) Shunt reactors | d) Voltage transformers |
- 7) Which of the following are the methods of grounding?
 

|               |                 |
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| a) Resistance | b) Reactance    |
| c) Solid      | d) All of these |
- 8) Corona is accompanied by \_\_\_\_\_.
 

|                           |                     |
|---------------------------|---------------------|
| a) violet visible glow    | b) hissing noise    |
| c) formation of ozone gas | d) all of the above |

- 9) Corona usually occurs when the electrostatic stress in the air around the conductor succeeds \_\_\_\_\_.  
a) 30 kV (maximum value)/cm      b) 22 kV (maximum value)/cm  
c) 11 kV (rms value)/cm      d) 6.6 kV (rms value)/cm
- 10) The sag of transmission line is least affected owing to \_\_\_\_\_.  
a) Weight of conductor      b) Current through the conductor  
c) Temperature      d) Ice deposited on the conductor
- 11) In a cable immediately above metallic sheath \_\_\_\_\_ is provided.  
a) Earthing connection      b) Bedding  
c) Armouring      d) None of the above
- 12) The process of achieving uniformity in the dielectric stress by using layers of different dielectrics is known as \_\_\_\_\_.  
a) Stranding process      b) Grading of cables  
c) Stress distribution      d) Capacitance grading
- 13) The thickness of the layer of insulation on the conductor, in cables, depends upon \_\_\_\_\_.  
a) Reactive power      b) Power factor  
c) Voltage      d) Current carrying capacity
- 14) By using which conductor is the skin effect reduced?  
a) Bundled conductors      b) Stranded conductors  
c) Hollow conductors      d) Solid conductors

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Attempt any four.** **16**

- a) Explain phenomenon of corona with advantages and disadvantages.
- b) A single core cable has a conductor diameter of 2.5 cm & insulation of thickness of 1.2 cm. If the specific resistance of insulation is  $4.5 \times 10^{14} \Omega \text{ cm}$ , calculate the insulation resistance per kilometre length of cable.
- c) Explain the concept of GMR & GMD.
- d) An overhead line has a span of 260 m, the weight of the line conductor is 0.68 kg per meter run. Calculate the value of maximum sag in the line if the maximum allowable tension in the line is 1550 kg.
- e) Explain in detail skin effect & proximity effect.
- f) Derive the expression for capacitance of single core cable.

**Q.3 Attempt any two.** **12**

- 1) An overhead transmission line at a river crossing is supported from two towers at heights of 40m and 90m above water level, the horizontal distance between the towers being 400m. If the maximum allowable tension is 2000kg. Find the clearance between the conductor and water at a point mid-way between the towers. Weight of conductor is 1kg/m.
- 2) Derive the expression for inductance of single phase two wire line.
- 3) Explain the following methods of cable grading:
  - i) Capacitance grading
  - ii) Intersheath grading

**Section – II**

**Q.4 Attempt any four.** **16**

- a) Derive an expression for voltage regulation and efficiency of short transmission line along with the equivalent circuit and phasor diagram.
- b) Explain different equipment used in substation.
- c) Write short note on connection schemes of distribution systems.
- d) A 3-phase, 50Hz, 150 km line has a resistance, inductive reactance and capacitive shunt admittance of  $0.1 \Omega$ ,  $0.5 \Omega$  and  $3 \times 10^{-6} \text{ S}$  per km per phase. If the line delivers 50 MW at 110 kV and 0.8 p.f. lagging, determine the sending end voltage and current. Assume a nominal  $\pi$  circuit for the line.
- e) Draw and explain concentrated loaded DC distributor fed at one end.
- f) Write short note on resistance & reactance grounding.

**Q.5 Attempt any two:**

- 1) A single phase overhead transmission line delivers 1100 kW at 33KV at 0.8p.f lagg. The total resistance and inductive reactance of the line are  $10\Omega$  and  $15\Omega$  respectively.  
Determine:
  - i) Sending end voltage
  - ii) Sending end power factor
  - iii) Transmission Efficiency
- 2) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal T method.
- 3) A 2 wire dc distributor 600 m long as loaded as under:
 

|                            |     |     |     |     |
|----------------------------|-----|-----|-----|-----|
| Distance from A in meters: | 150 | 300 | 350 | 450 |
| Loads in amperes:          | 100 | 200 | 250 | 300 |

The feeding point A is maintained at 440 V and that of B at 430 V. If each conductor has a resistance of 0.01 ohm per 100 m.  
Calculate:

  - i) the current supplied from A to B
  - ii) the power dissipated in the distributor

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Feeder is designed mainly from the point of view of \_\_\_\_\_.  
 a) Its current carrying capacity      b) Voltage drop in it  
 c) Operating voltage      d) Operating Frequency
- 2) Which of the following distribution systems is more reliable?  
 a) Radial system      b) Tree system  
 c) Ring main system      d) All are equally reliable
- 3) In a substation the following equipment is not installed \_\_\_\_\_.  
 a) Exciters      b) Series capacitors  
 c) Shunt reactors      d) Voltage transformers
- 4) Which of the following are the methods of grounding?  
 a) Resistance      b) Reactance  
 c) Solid      d) All of these
- 5) Corona is accompanied by \_\_\_\_\_.  
 a) violet visible glow      b) hissing noise  
 c) formation of ozone gas      d) all of the above
- 6) Corona usually occurs when the electrostatic stress in the air around the conductor succeeds \_\_\_\_\_.  
 a) 30 kV (maximum value)/cm      b) 22 kV (maximum value)/cm  
 c) 11 kV (rms value)/cm      d) 6.6 kV (rms value)/cm
- 7) The sag of transmission line is least affected owing to \_\_\_\_\_.  
 a) Weight of conductor      b) Current through the conductor  
 c) Temperature      d) Ice deposited on the conductor
- 8) In a cable immediately above metallic sheath \_\_\_\_\_ is provided.  
 a) Earthing connection      b) Bedding  
 c) Armouring      d) None of the above
- 9) The process of achieving uniformity in the dielectric stress by using layers of different dielectrics is known as \_\_\_\_\_.  
 a) Stranding process      b) Grading of cables  
 c) Stress distribution      d) Capacitance grading



- 10) The thickness of the layer of insulation on the conductor, in cables, depends upon \_\_\_\_\_.
  - a) Reactive power
  - b) Power factor
  - c) Voltage
  - d) Current carrying capacity
- 11) By using which conductor is the skin effect reduced?
  - a) Bundled conductors
  - b) Stranded conductors
  - c) Hollow conductors
  - d) Solid conductors
- 12) Which of the following is correct operating voltage range for short transmission lines?
  - a) Less than 456 KV
  - b) Less than 132 KV
  - c) Less than 20 KV
  - d) Less than 100 KV
- 13) In any transmission line  $AD - BC =$  \_\_\_\_\_?
  - a) 1
  - b) 0
  - c) 2
  - d) 3
- 14) The values of A, B, C and D constants for a short transmission line are respectively \_\_\_\_\_.
  - a) Z, 0, 1 and 1
  - b) 0, 1, 1 and Z
  - c) 1, Z, 0 and 1
  - d) 1, 1, Z and 0

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Attempt any four.** **16**

- a) Explain phenomenon of corona with advantages and disadvantages.
- b) A single core cable has a conductor diameter of 2.5 cm & insulation of thickness of 1.2 cm. If the specific resistance of insulation is  $4.5 \times 10^{14} \Omega \text{ cm}$ , calculate the insulation resistance per kilometre length of cable.
- c) Explain the concept of GMR & GMD.
- d) An overhead line has a span of 260 m, the weight of the line conductor is 0.68 kg per meter run. Calculate the value of maximum sag in the line if the maximum allowable tension in the line is 1550 kg.
- e) Explain in detail skin effect & proximity effect.
- f) Derive the expression for capacitance of single core cable.

**Q.3 Attempt any two.** **12**

- 1) An overhead transmission line at a river crossing is supported from two towers at heights of 40m and 90m above water level, the horizontal distance between the towers being 400m. If the maximum allowable tension is 2000kg. Find the clearance between the conductor and water at a point mid-way between the towers. Weight of conductor is 1kg/m.
- 2) Derive the expression for inductance of single phase two wire line.
- 3) Explain the following methods of cable grading:
  - i) Capacitance grading
  - ii) Intersheath grading

**Section – II**

**Q.4 Attempt any four.** **16**

- a) Derive an expression for voltage regulation and efficiency of short transmission line along with the equivalent circuit and phasor diagram.
- b) Explain different equipment used in substation.
- c) Write short note on connection schemes of distribution systems.
- d) A 3-phase, 50Hz, 150 km line has a resistance, inductive reactance and capacitive shunt admittance of  $0.1 \Omega$ ,  $0.5 \Omega$  and  $3 \times 10^{-6} \text{ S}$  per km per phase. If the line delivers 50 MW at 110 kV and 0.8 p.f. lagging, determine the sending end voltage and current. Assume a nominal  $\pi$  circuit for the line.
- e) Draw and explain concentrated loaded DC distributor fed at one end.
- f) Write short note on resistance & reactance grounding.

**Q.5 Attempt any two:**

- 1) A single phase overhead transmission line delivers 1100 kW at 33KV at 0.8p.f lagg. The total resistance and inductive reactance of the line are  $10\Omega$  and  $15\Omega$  respectively.  
Determine:
  - i) Sending end voltage
  - ii) Sending end power factor
  - iii) Transmission Efficiency
- 2) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal T method.
- 3) A 2 wire dc distributor 600 m long as loaded as under:  
Distance from A in meters: 150   300   350   450  
Loads in amperes:            100   200   250   300  
The feeding point A is maintained at 440 V and that of B at 430 V. If each conductor has a resistance of 0.01 ohm per 100 m.  
Calculate:
  - i) the current supplied from A to B
  - ii) the power dissipated in the distributor

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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The thickness of the layer of insulation on the conductor, in cables, depends upon \_\_\_\_\_.  
a) Reactive power                      b) Power factor  
c) Voltage                                  d) Current carrying capacity
- 2) By using which conductor is the skin effect reduced?  
a) Bundled conductors                  b) Stranded conductors  
c) Hollow conductors                  d) Solid conductors
- 3) Which of the following is correct operating voltage range for short transmission lines?  
a) Less than 456 KV                      b) Less than 132 KV  
c) Less than 20 KV                        d) Less than 100 KV
- 4) In any transmission line  $AD-BC = \underline{\hspace{2cm}}$ ?  
a) 1                                              b) 0  
c) 2                                              d) 3
- 5) The values of A, B, C and D constants for a short transmission line are respectively \_\_\_\_\_.  
a) Z, 0, 1 and 1                              b) 0, 1, 1 and Z  
c) 1, Z, 0 and 1                              d) 1, 1, Z and O
- 6) Feeder is designed mainly from the point of view of \_\_\_\_\_.  
a) Its current carrying capacity          b) Voltage drop in it  
c) Operating voltage                        d) Operating Frequency
- 7) Which of the following distribution systems is more reliable?  
a) Radial system                              b) Tree system  
c) Ring main system                        d) All are equally reliable
- 8) In a substation the following equipment is not installed \_\_\_\_\_.  
a) Exciters                                      b) Series capacitors  
c) Shunt reactors                             d) Voltage transformers

- 9) Which of the following are the methods of grounding?
  - a) Resistance
  - b) Reactance
  - c) Solid
  - d) All of these
- 10) Corona is accompanied by \_\_\_\_\_.
  - a) violet visible glow
  - b) hissing noise
  - c) formation of ozone gas
  - d) all of the above
- 11) Corona usually occurs when the electrostatic stress in the air around the conductor succeeds \_\_\_\_\_.
  - a) 30 kV (maximum value)/cm
  - b) 22 kV (maximum value)/cm
  - c) 11 kV (rms value)/cm
  - d) 6.6 kV (rms value)/cm
- 12) The sag of transmission line is least affected owing to \_\_\_\_\_.
  - a) Weight of conductor
  - b) Current through the conductor
  - c) Temperature
  - d) Ice deposited on the conductor
- 13) In a cable immediately above metallic sheath \_\_\_\_\_ is provided.
  - a) Earthing connection
  - b) Bedding
  - c) Armouring
  - d) None of the above
- 14) The process of achieving uniformity in the dielectric stress by using layers of different dielectrics is known as \_\_\_\_\_.
  - a) Stranding process
  - b) Grading of cables
  - c) Stress distribution
  - d) Capacitance grading

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks

**Section – I**

**Q.2 Attempt any four.** **16**

- a) Explain phenomenon of corona with advantages and disadvantages.
- b) A single core cable has a conductor diameter of 2.5 cm & insulation of thickness of 1.2 cm. If the specific resistance of insulation is  $4.5 \times 10^{14} \Omega \text{ cm}$ , calculate the insulation resistance per kilometre length of cable.
- c) Explain the concept of GMR & GMD.
- d) An overhead line has a span of 260 m, the weight of the line conductor is 0.68 kg per meter run. Calculate the value of maximum sag in the line if the maximum allowable tension in the line is 1550 kg.
- e) Explain in detail skin effect & proximity effect.
- f) Derive the expression for capacitance of single core cable.

**Q.3 Attempt any two.** **12**

- 1) An overhead transmission line at a river crossing is supported from two towers at heights of 40m and 90m above water level, the horizontal distance between the towers being 400m. If the maximum allowable tension is 2000kg. Find the clearance between the conductor and water at a point mid-way between the towers. Weight of conductor is 1kg/m.
- 2) Derive the expression for inductance of single phase two wire line.
- 3) Explain the following methods of cable grading:
  - i) Capacitance grading
  - ii) Intersheath grading

**Section – II**

**Q.4 Attempt any four.** **16**

- a) Derive an expression for voltage regulation and efficiency of short transmission line along with the equivalent circuit and phasor diagram.
- b) Explain different equipment used in substation.
- c) Write short note on connection schemes of distribution systems.
- d) A 3-phase, 50Hz, 150 km line has a resistance, inductive reactance and capacitive shunt admittance of  $0.1 \Omega$ ,  $0.5 \Omega$  and  $3 \times 10^{-6} \text{ S}$  per km per phase. If the line delivers 50 MW at 110 kV and 0.8 p.f. lagging, determine the sending end voltage and current. Assume a nominal  $\pi$  circuit for the line.
- e) Draw and explain concentrated loaded DC distributor fed at one end.
- f) Write short note on resistance & reactance grounding.

**Q.5 Attempt any two:**

- 1) A single phase overhead transmission line delivers 1100 kW at 33KV at 0.8p.f lagg. The total resistance and inductive reactance of the line are  $10\Omega$  and  $15\Omega$  respectively.  
Determine:
  - i) Sending end voltage
  - ii) Sending end power factor
  - iii) Transmission Efficiency
- 2) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal T method.
- 3) A 2 wire dc distributor 600 m long as loaded as under:  
Distance from A in meters: 150   300   350   450  
Loads in amperes:                100   200   250   300  
The feeding point A is maintained at 440 V and that of B at 430 V. If each conductor has a resistance of 0.01 ohm per 100 m.  
Calculate:
  - i) the current supplied from A to B
  - ii) the power dissipated in the distributor

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Set **P**

**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

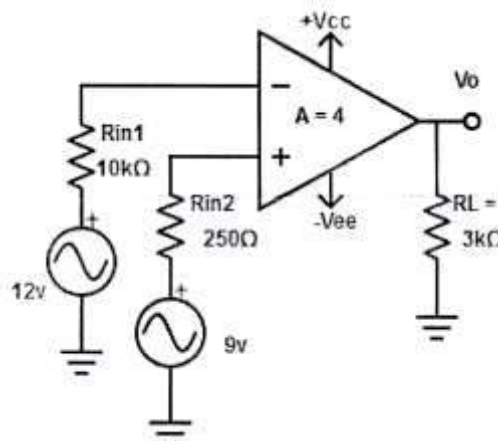
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

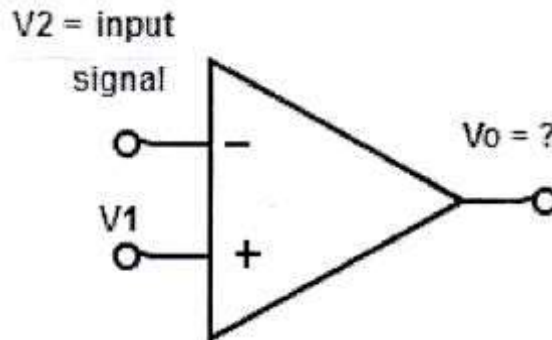
- 1) If output is measured between two collectors of transistors, then the Differential amplifier with two input signal is said to be configured as
  - a) Dual Input Balanced Output      b) Dual Input Unbalanced Output
  - c) Single Input Balanced Output    d) Dual Input Unbalanced Output
- 2) In ideal Differential Amplifier, if same signal is given to both inputs, then output will be
  - a) Same as input                              b) Double the input
  - c) Not equal to zero                          d) Zero
- 3) Which is not the internal circuit of operational amplifier?
  - a) Differential amplifier                      b) Level translator
  - c) Output driver                                d) Clamper
- 4) What is the purpose of differential amplifier stage in internal circuit of Op-amp?
  - a) Low gain to differential mode signal
  - b) Cancel difference mode signal
  - c) Low gain to common mode signal
  - d) Cancel common mode signal
- 5) Calculate the output voltage for the given circuit.



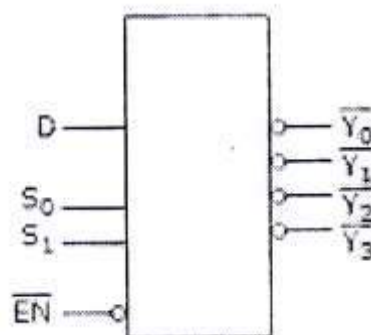
- a)  $V_o = 7v$                                       b)  $V_o = 5.9v$
- c)  $V_o = 12v$                                    d)  $V_o = 11.4v$



- 6) Determine the output from the following circuit, if  $V_1 = 0V$



- a)  $180^\circ$  in phase with input signal  
 b)  $180^\circ$  out of phase with input signal  
 c) Same as that of input signal  
 d) Output signal cannot be determined
- 7) In which amplifier the output voltage is equal to the negative sum of all the inputs?  
 a) Averaging amplifier  
 b) Summing amplifier  
 c) Scaling amplifier  
 d) All of the mentioned
- 8) The logical sum of two or more logical product terms is called \_\_\_\_\_.  
 a) SOP  
 b) POS  
 c) OR operation  
 d) NAND operation
- 9) According to the property of minterm, how many combination will have value equal to 1 for K input variables?  
 a) 0  
 b) 1  
 c) 2  
 d) 3
- 10) There are \_\_\_\_\_ cells in a 4-variable K-map.  
 a) 12  
 b) 16  
 c) 18  
 d) 8
- 11) The device shown here is most likely a \_\_\_\_\_.



- a) Comparator  
 b) Multiplexer  
 c) Inverter  
 d) Demultiplexer
- 12) In S-R flip-flop, if  $Q = 0$  the output is said to be \_\_\_\_\_.  
 a) Set  
 b) Reset  
 c) Previous state  
 d) Current state
- 13) How many types of registers are?  
 a) 2  
 b) 3  
 c) 4  
 d) 5

- 14)** Registers capable of shifting in one direction is \_\_\_\_\_.
- |                             |                                  |
|-----------------------------|----------------------------------|
| a) Universal shift register | b) Unidirectional shift register |
| c) Unipolar shift register  | d) Unique shift register         |

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| Set | P |
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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Consider the data whenever necessary and mention the assumptions in answer.

**Section – I**

- Q.2 Attempt any four.** **16**
- Explain Differential Amplifier with differential gain.
  - Enlist idea and Practical characteristics of Op-Amp
  - Explain Common Mode Rejection ratio.
  - Explain with block diagram for voltage shunt close loop configuration.
  - Explain Subtractor with suitable diagram.
- Q.3 Solve any two.** **12**
- Explain integrator and Differentiator using Op-Amp.
  - Explain Current to Voltage converter with grounded load.
  - Draw block diagram of Op-Amp. Also explain Equivalent circuit for it with its ideal voltage transfer curve.

**Section – II**

- Q.4 Attempt any four.** **16**
- Minimize the Boolean equation using K-Map  
 $F(A,B,C,D) = \sum m(0,1,2,5,7,8,9,10,13,15)$
  - Explain 4x1 Mux with truth table.
  - Design Half Adder with truth table.
  - Explain T-Flip-flop with truth table and timing diagram.
  - Explain Ring counter with truth table and timing diagram.
- Q.5 Attempt any two:** **12**
- Design Modulus 6 Counter with state diagram.
  - Explain 4 bit Bidirectional shift register.
  - Convert JK flip-flop to D Flip-flop.

**Seat  
No.**

Max. Marks: 70

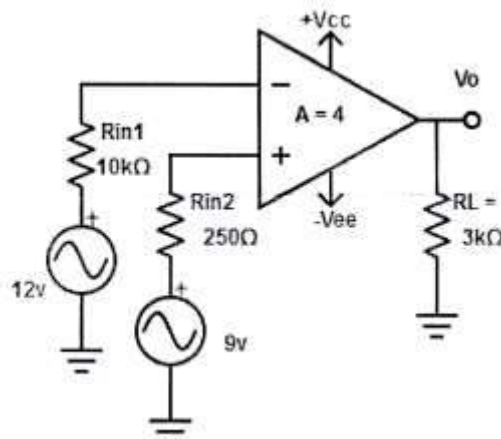
Marks: 14

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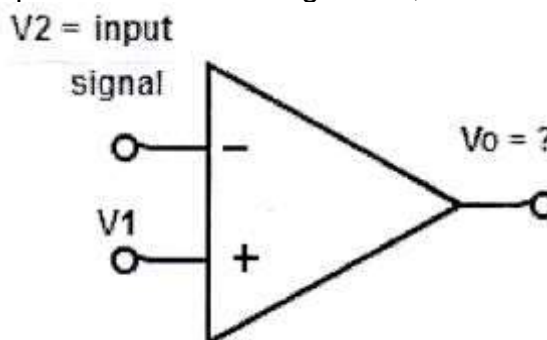
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- Page 5 of 16

- 7) Registers capable of shifting in one direction is \_\_\_\_\_.  
 a) Universal shift register      b) Unidirectional shift register  
 c) Unipolar shift register      d) Unique shift register
- 8) If output is measured between two collectors of transistors, then the Differential amplifier with two input signal is said to be configured as  
 a) Dual Input Balanced Output      b) Dual Input Unbalanced Output  
 c) Single Input Balanced Output      d) Dual Input Unbalanced Output
- 9) In ideal Differential Amplifier, if same signal is given to both inputs, then output will be  
 a) Same as input      b) Double the input  
 c) Not equal to zero      d) Zero
- 10) Which is not the internal circuit of operational amplifier?  
 a) Differential amplifier      b) Level translator  
 c) Output driver      d) Clamper
- 11) What is the purpose of differential amplifier stage in internal circuit of Op-amp?  
 a) Low gain to differential mode signal  
 b) Cancel difference mode signal  
 c) Low gain to common mode signal  
 d) Cancel common mode signal
- 12) Calculate the output voltage for the given circuit.



- a)  $V_o = 7v$       b)  $V_o = 5.9v$   
 c)  $V_o = 12v$       d)  $V_o = 11.4v$
- 13) Determine the output from the following circuit, if  $V_1 = 0v$



- a)  $180^\circ$  in phase with input signal  
 b)  $180^\circ$  out of phase with input signal  
 c) Same as that of input signal  
 d) Output signal cannot be determined

- 14)** In which amplifier the output voltage is equal to the negative sum of all the inputs?
- |                        |                         |
|------------------------|-------------------------|
| a) Averaging amplifier | b) Summing amplifier    |
| c) Scaling amplifier   | d) All of the mentioned |

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| Set | Q |
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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Consider the data whenever necessary and mention the assumptions in answer.

**Section – I**

- Q.2 Attempt any four.** **16**
- Explain Differential Amplifier with differential gain.
  - Enlist idea and Practical characteristics of Op-Amp
  - Explain Common Mode Rejection ratio.
  - Explain with block diagram for voltage shunt close loop configuration.
  - Explain Subtractor with suitable diagram.
- Q.3 Solve any two.** **12**
- Explain integrator and Differentiator using Op-Amp.
  - Explain Current to Voltage converter with grounded load.
  - Draw block diagram of Op-Amp. Also explain Equivalent circuit for it with its ideal voltage transfer curve.

**Section – II**

- Q.4 Attempt any four.** **16**
- Minimize the Boolean equation using K-Map  
 $F(A,B,C,D) = \sum m(0,1,2,5,7,8,9,10,13,15)$
  - Explain 4x1 Mux with truth table.
  - Design Half Adder with truth table.
  - Explain T-Flip-flop with truth table and timing diagram.
  - Explain Ring counter with truth table and timing diagram.
- Q.5 Attempt any two:** **12**
- Design Modulus 6 Counter with state diagram.
  - Explain 4 bit Bidirectional shift register.
  - Convert JK flip-flop to D Flip-flop.

**Seat  
No.**

| Set | R |
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| 1   | 1 |
| 2   | 1 |
| 3   | 1 |
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| 6   | 1 |
| 7   | 1 |
| 8   | 1 |
| 9   | 1 |
| 10  | 1 |
| 11  | 1 |
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| 98  | 1 |
| 99  | 1 |
| 100 | 1 |

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks

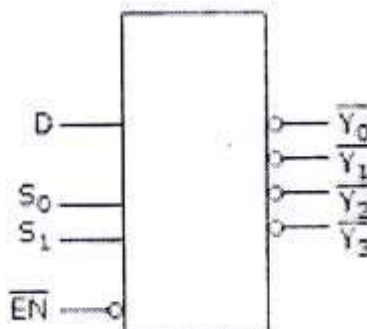
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

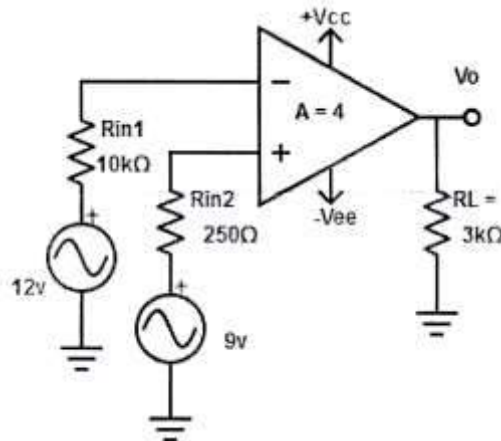
1) The device shown here is most likely a \_\_\_\_\_.



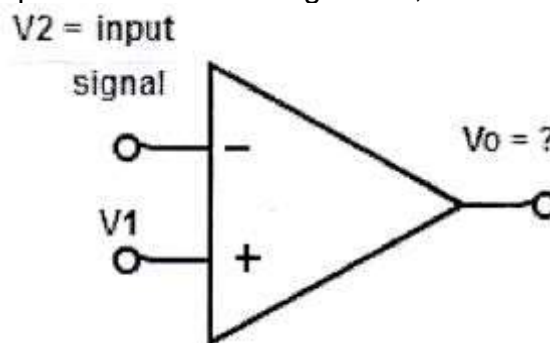
- a) Comparator
  - b) Multiplexer
  - c) Inverter
  - d) Demultiplexer
- 2) In S-R flip-flop, if  $Q = 0$  the output is said to be \_\_\_\_\_.  
a) Set- b) Reset
- c) Previous state
- d) Current state
- 3) How many types of registers are?  
a) 2- b) 3
- c) 4
- d) 5
- 4) Registers capable of shifting in one direction is \_\_\_\_\_.  
a) Universal shift register- b) Unidirectional shift register
- c) Unipolar shift register
- d) Unique shift register
- 5) If output is measured between two collectors of transistors, then the Differential amplifier with two input signal is said to be configured as  
a) Dual Input Balanced Output- b) Dual Input Unbalanced Output
- c) Single Input Balanced Output
- d) Dual Input Unbalanced Output
- 6) In ideal Differential Amplifier, if same signal is given to both inputs, then output will be  
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- c) Not equal to zero
- d) Zero



- 7) Which is not the internal circuit of operational amplifier?  
 a) Differential amplifier                      b) Level translator  
 c) Output driver                                d) Clamper
- 8) What is the purpose of differential amplifier stage in internal circuit of Op-amp?  
 a) Low gain to differential mode signal  
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- 9) Calculate the output voltage for the given circuit.



- a)  $V_o = 7v$                                       b)  $V_o = 5.9v$   
 c)  $V_o = 12v$                                     d)  $V_o = 11.4v$
- 10) Determine the output from the following circuit, if  $V_1 = 0v$



- a)  $180^\circ$  in phase with input signal  
 b)  $180^\circ$  out of phase with input signal  
 c) Same as that of input signal  
 d) Output signal cannot be determined
- 11) In which amplifier the output voltage is equal to the negative sum of all the inputs?  
 a) Averaging amplifier                      b) Summing amplifier  
 c) Scaling amplifier                         d) All of the mentioned
- 12) The logical sum of two or more logical product terms is called \_\_\_\_\_.  
 a) SOP                                              b) POS  
 c) OR operation                                d) NAND operation
- 13) According to the property of minterm, how many combination will have value equal to 1 for K input variables?  
 a) 0                                                  b) 1  
 c) 2                                                  d) 3

- 14)** There are \_\_\_\_\_ cells in a 4-variable K-map.
- |       |       |
|-------|-------|
| a) 12 | b) 16 |
| c) 18 | d) 8  |

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| Seat No. |  |
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| Set | R |
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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks  
 3) Consider the data whenever necessary and mention the assumptions in answer.

**Section – I**

- Q.2 Attempt any four.** **16**
- Explain Differential Amplifier with differential gain.
  - Enlist idea and Practical characteristics of Op-Amp
  - Explain Common Mode Rejection ratio.
  - Explain with block diagram for voltage shunt close loop configuration.
  - Explain Subtractor with suitable diagram.
- Q.3 Solve any two.** **12**
- Explain integrator and Differentiator using Op-Amp.
  - Explain Current to Voltage converter with grounded load.
  - Draw block diagram of Op-Amp. Also explain Equivalent circuit for it with its ideal voltage transfer curve.

**Section – II**

- Q.4 Attempt any four.** **16**
- Minimize the Boolean equation using K-Map  
 $F(A,B,C,D) = \sum m(0,1,2,5,7,8,9,10,13,15)$
  - Explain 4x1 Mux with truth table.
  - Design Half Adder with truth table.
  - Explain T-Flip-flop with truth table and timing diagram.
  - Explain Ring counter with truth table and timing diagram.
- Q.5 Attempt any two:** **12**
- Design Modulus 6 Counter with state diagram.
  - Explain 4 bit Bidirectional shift register.
  - Convert JK flip-flop to D Flip-flop.

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Set **S**

**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks

**MCQ/Objective Type Questions**

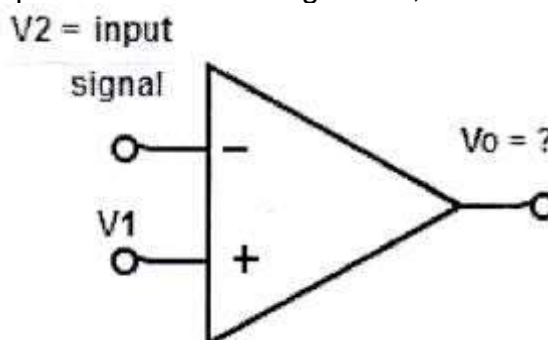
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

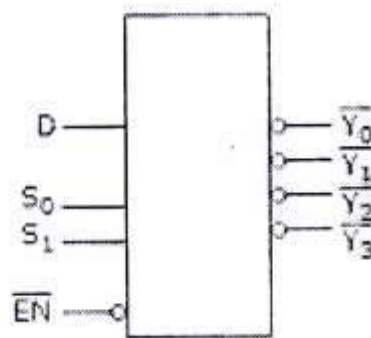
**14**

- 1) Determine the output from the following circuit, if  $V_1 = 0V$



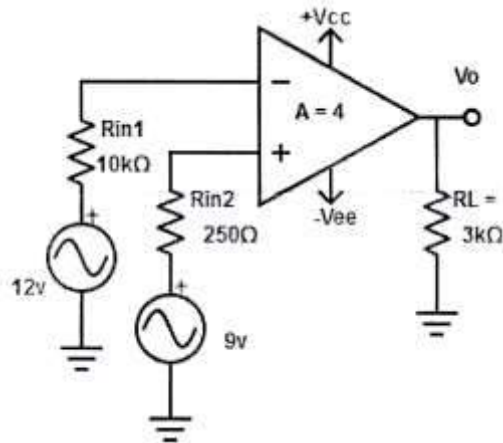
- a)  $180^\circ$  in phase with input signal  
 b)  $180^\circ$  out of phase with input signal  
 c) Same as that of input signal  
 d) Output signal cannot be determined
- 2) In which amplifier the output voltage is equal to the negative sum of all the inputs?  
 a) Averaging amplifier  
 b) Summing amplifier  
 c) Scaling amplifier  
 d) All of the mentioned
- 3) The logical sum of two or more logical product terms is called \_\_\_\_\_.  
 a) SOP  
 b) POS  
 c) OR operation  
 d) NAND operation
- 4) According to the property of minterm, how many combination will have value equal to 1 for K input variables?  
 a) 0  
 b) 1  
 c) 2  
 d) 3
- 5) There are \_\_\_\_\_ cells in a 4-variable K-map.  
 a) 12  
 b) 16  
 c) 18  
 d) 8

**6)** The device shown here is most likely a \_\_\_\_\_.



- a) Comparator
  - c) Inverter
  - b) Multiplexer
  - d) Demultiplexer
- 7) In S-R flip-flop, if  $Q = 0$  the output is said to be \_\_\_\_\_.  
a) Set  
b) Reset  
c) Previous state  
d) Current state
- 8) How many types of registers are?  
a) 2  
b) 3  
c) 4  
d) 5
- 9) Registers capable of shifting in one direction is \_\_\_\_\_.  
a) Universal shift register  
b) Unidirectional shift register  
c) Unipolar shift register  
d) Unique shift register
- 10) If output is measured between two collectors of transistors, then the Differential amplifier with two input signal is said to be configured as  
a) Dual Input Balanced Output  
b) Dual Input Unbalanced Output  
c) Single Input Balanced Output  
d) Dual Input Unbalanced Output
- 11) In ideal Differential Amplifier, if same signal is given to both inputs, then output will be  
a) Same as input  
b) Double the input  
c) Not equal to zero  
d) Zero
- 12) Which is not the internal circuit of operational amplifier?  
a) Differential amplifier  
b) Level translator  
c) Output driver  
d) Clamper
- 13) What is the purpose of differential amplifier stage in internal circuit of Op-amp?  
a) Low gain to differential mode signal  
b) Cancel difference mode signal  
c) Low gain to common mode signal  
d) Cancel common mode signal

14) Calculate the output voltage for the given circuit.



- a)  $V_o = 7v$
- c)  $V_o = 12v$

- b)  $V_o = 5.9v$
- d)  $V_o = 11.4v$

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**S.Y. (B.Tech) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated circuits**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks  
3) Consider the data whenever necessary and mention the assumptions in answer.

**Section – I**

- Q.2 Attempt any four.** **16**
- a) Explain Differential Amplifier with differential gain.
  - b) Enlist idea and Practical characteristics of Op-Amp
  - c) Explain Common Mode Rejection ratio.
  - d) Explain with block diagram for voltage shunt close loop configuration.
  - e) Explain Subtractor with suitable diagram.
- Q.3 Solve any two.** **12**
- a) Explain integrator and Differentiator using Op-Amp.
  - b) Explain Current to Voltage converter with grounded load.
  - c) Draw block diagram of Op-Amp. Also explain Equivalent circuit for it with its ideal voltage transfer curve.

**Section – II**

- Q.4 Attempt any four.** **16**
- a) Minimize the Boolean equation using K-Map  
 $F(A,B,C,D) = \sum m(0,1,2,5,7,8,9,10,13,15)$
  - b) Explain 4x1 Mux with truth table.
  - c) Design Half Adder with truth table.
  - d) Explain T-Flip-flop with truth table and timing diagram.
  - e) Explain Ring counter with truth table and timing diagram.
- Q.5 Attempt any two:** **12**
- a) Design Modulus 6 Counter with state diagram.
  - b) Explain 4 bit Bidirectional shift register.
  - c) Convert JK flip-flop to D Flip-flop.

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

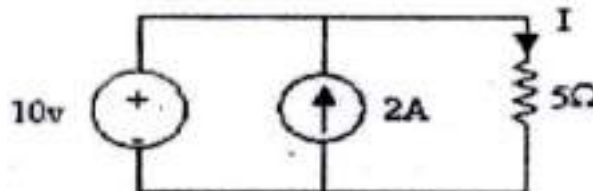
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

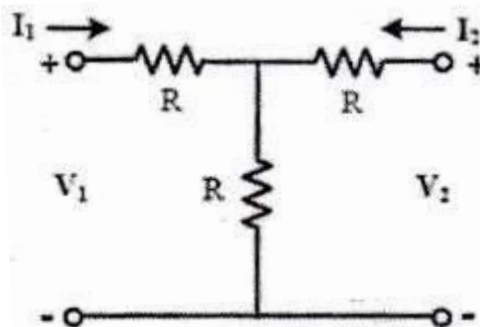
- 1) Kirchhoff's voltage law is related to
  - a) Battery E.M.F' s and IR drops
  - b) Battery E.M.F' s only
  - c) IR drops only
  - d) Junction currents
- 2) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?
  - a)  $4\Omega$
  - b)  $8\Omega$
  - c)  $2.5\Omega$
  - d)  $5\Omega$
- 3) Calculate current I of the circuit shown below.



- a) 4 A
  - b) 2 A
  - c) -2 A
  - d) -4 A
- 4) Application of Thevenin's theorem to a circuit yields
  - a) Equivalent voltage source and impedance in series
  - b) Equivalent current source and impedance in parallel
  - c) Equivalent impedance
  - d) Equivalent current source
- 5) Rank of tie set matrix is
  - a) N
  - b) N-1
  - c) B-N + 1
  - d) B-N-1
- 6) The nodal method of circuit analysis is based on
  - a) KVL and ohms law
  - b) KCL and ohms law
  - c) KVL and KCL
  - d) KCL, KVL and ohms law



- 7) Superposition theorem is not applicable to network containing  
 a) nonlinear elements  
 b) dependent voltage source  
 c) dependent current source  
 d) Transformers
- 8) The time constant of RC circuit is \_\_\_\_\_.  
 a) RC  
 b) C/R  
 c) R/C  
 d) R
- 9) Laplace transform of a unit ramp function is \_\_\_\_\_.  
 a) 1  
 b) s  
 c) 1/s  
 d) 1/s<sup>2</sup>
- 10) The value of impulse function for  $t > 0$   
 a) Zero  
 b) Unity  
 c) K where k is a constant  
 d) Infinity
- 11) A capacitor does not allow sudden changes in \_\_\_\_\_.  
 a) Currents  
 b) Voltages  
 c) both a and b  
 d) none of Above
- 12) Transients are presents in the circuit when the circuit is having  
 a) R  
 b) L  
 c) C  
 d) either b) or c)
- 13) For a 2-port network to be reciprocal, \_\_\_\_\_.  
 a)  $Z_{11} = Z_{22}$   
 b)  $Y_{21} = Y_{22}$   
 c)  $h_{21} = -h_{12}$   
 d)  $AD - BC = 0$
- 14) The hybrid parameters  $h_{21}$  of the two-port network in the figure are



- a)  $-1/2$   
 b)  $1/2$   
 c)  $-3/2$   
 d)  $3/2$

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

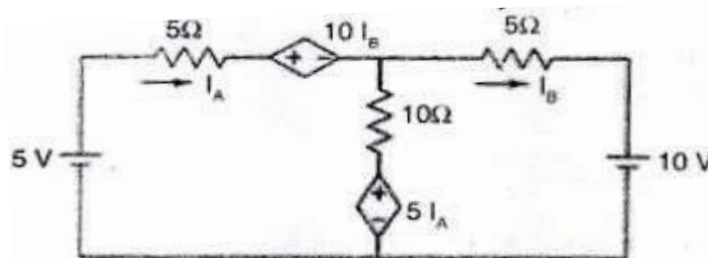
Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

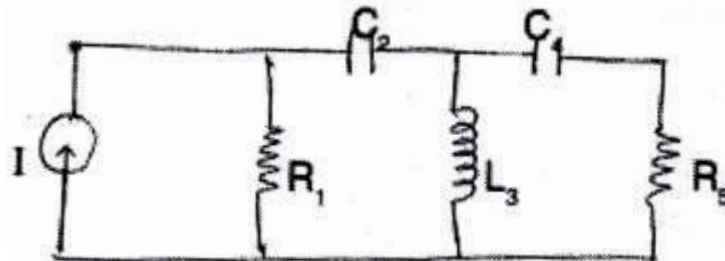
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I****Q.2 Attempt any four.****16**

a) Obtain branch currents using mesh analysis.

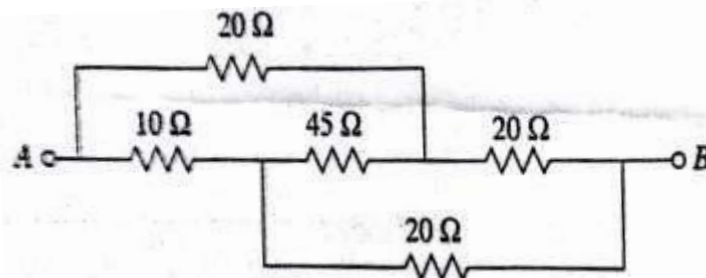


b) Draw the dual of the network.

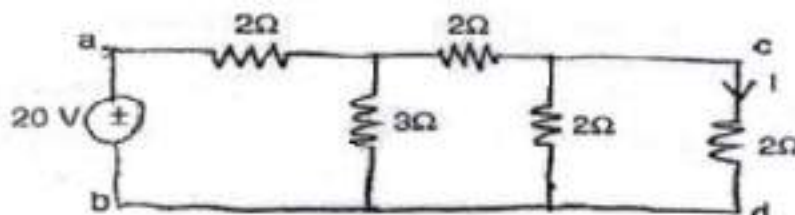


c) Derive the condition for Maximum power transfer.

d) Find the Equivalent Resistance between terminal A &amp; B.

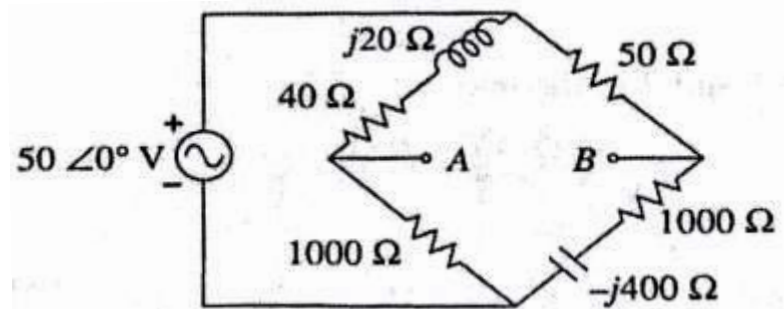


e) Verify the Reciprocity theorem for the network shown below

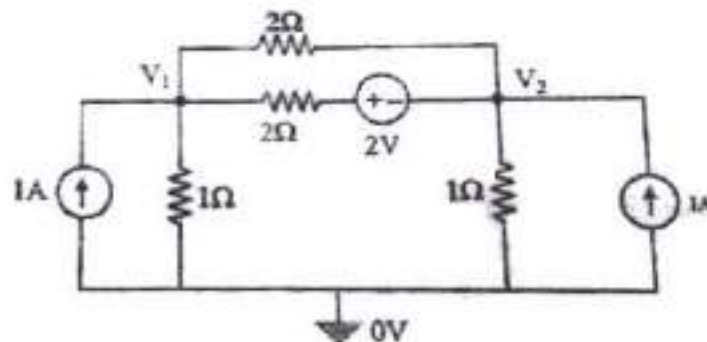


**Q.3 Attempt any two.**

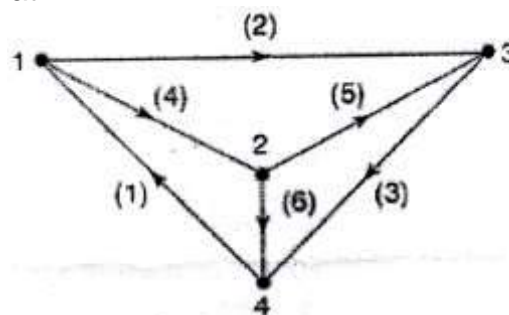
- a) Obtain the Thevenin's equivalent Network across terminals AB of the circuit shown in given figure.



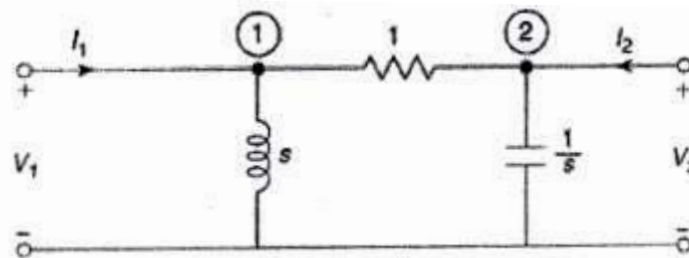
- b) Consider the following circuit, determine node voltages  $V_1$  and  $V_2$



- c) The graph of a network shown in fig. write a) Incidence matrix b) Tie set matrix c) Cut set matrix.

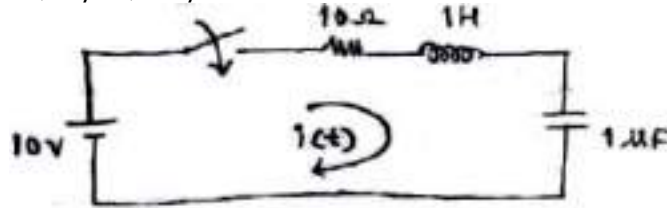
**Section II****Q.4 Attempt Any Four**

- a) Determine transmission parameters for the given network.

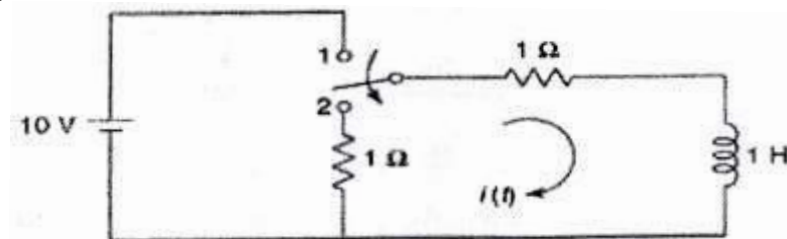


- b) Derive an expression for response given by RL circuit.

- c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find  $i$ ,  $di/dt$ ,  $d^2i/dt^2$  at  $t = 0 +$



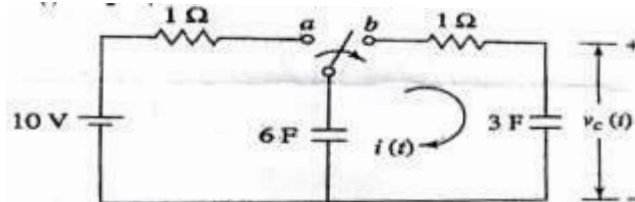
- d) Derive Y-Parameter in terms of Z parameters.  
 e) In the network shown in fig. the switch is moved from 1 to 2 at  $t = 0$ . Steady state condition having reached in position 1. Determine  $i(t)$  for  $t > 0$  using Laplace transforms.



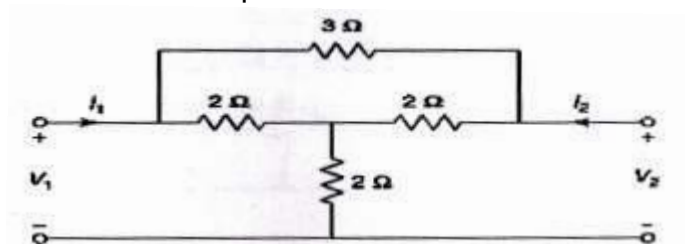
### Q.5 Attempt Any Two

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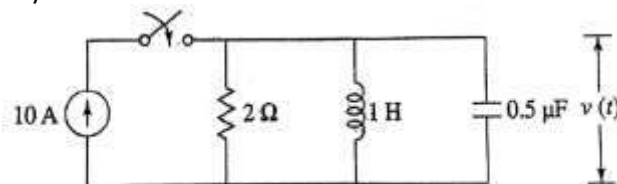
- a) In the network of fig. the switch is moved from a to b at  $t = 0$ . Determine  $i(t)$  and  $V_c(t)$  using Laplace transform.



- b) Find Y parameter for the two-port network shown.



- c) For the Network shown in Fig. Switch is closed at  $t = 0$ , determine  $v$ ,  $dv/dt$  and  $d^2v/dt^2$  at  $t = 0 +$



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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

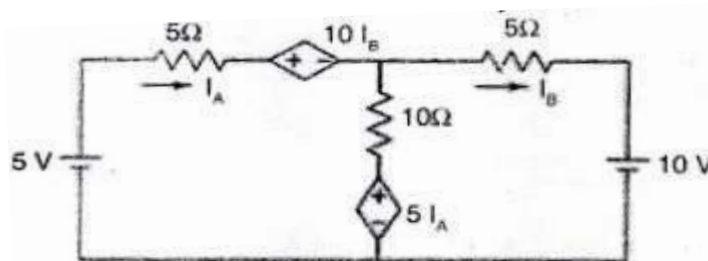
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

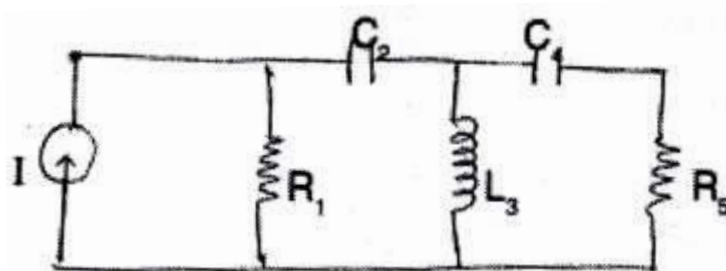
**Q.2 Attempt any four.**

**16**

a) Obtain branch currents using mesh analysis.

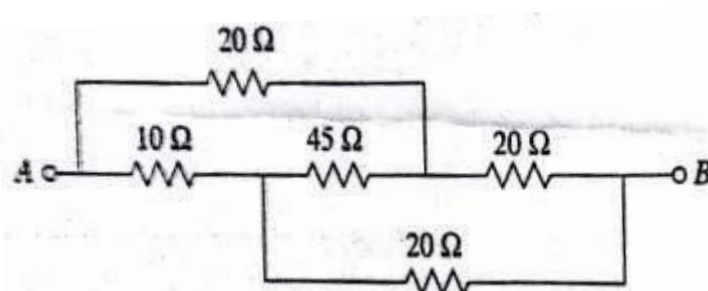


b) Draw the dual of the network.

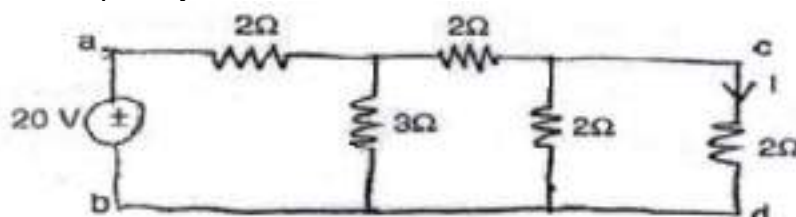


c) Derive the condition for Maximum power transfer.

d) Find the Equivalent Resistance between terminal A&B.

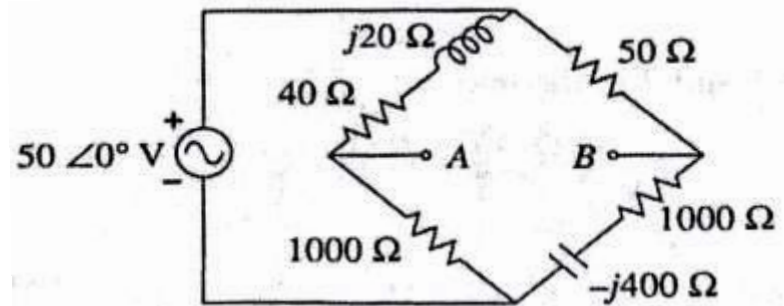


e) Verify the Reciprocity theorem for the network shown below

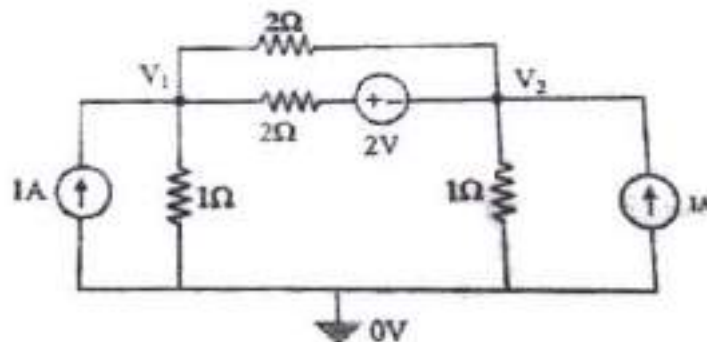


**Q.3 Attempt any two.**

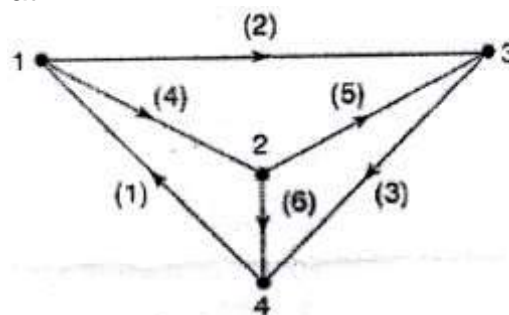
- a) Obtain the Thevenin's equivalent Network across terminals AB of the circuit shown in given figure.



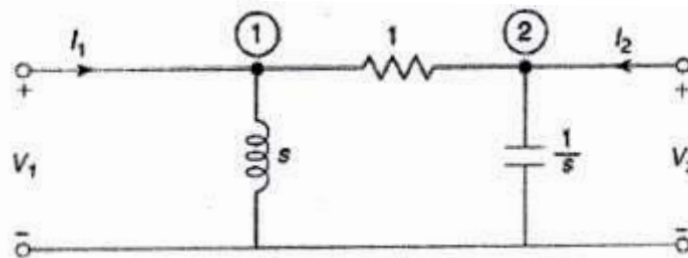
- b) Consider the following circuit, determine node voltages  $V_1$  and  $V_2$



- c) The graph of a network shown in fig. write a) Incidence matrix b) Tie set matrix c) Cut set matrix.

**Section II****Q.4 Attempt Any Four**

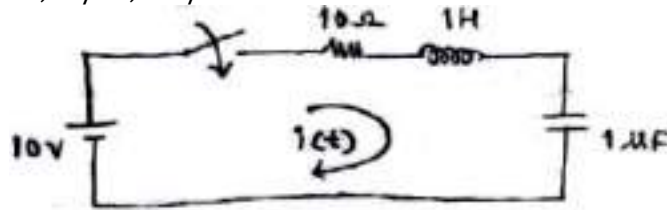
- a) Determine transmission parameters for the given network.



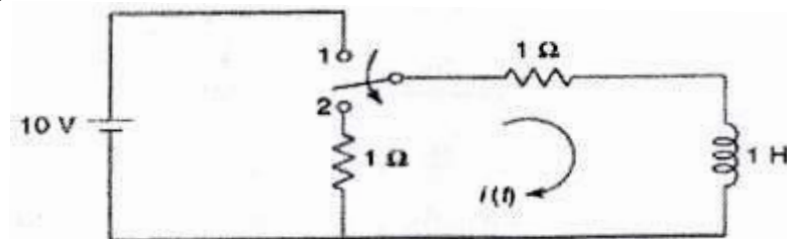
- b) Derive an expression for response given by RL circuit.



- c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find  $i$ ,  $di/dt$ ,  $d^2i/dt^2$  at  $t = 0 +$



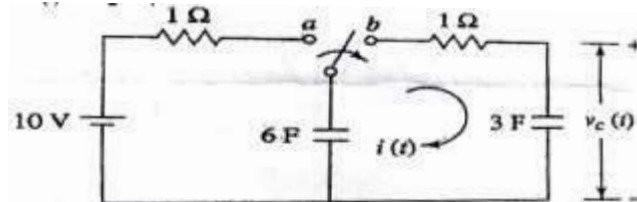
- d) Derive Y-Parameter in terms of Z parameters.  
 e) In the network shown in fig. the switch is moved from 1 to 2 at  $t = 0$ . Steady state condition having reached in position 1. Determine  $i(t)$  for  $t > 0$  using Laplace transforms.



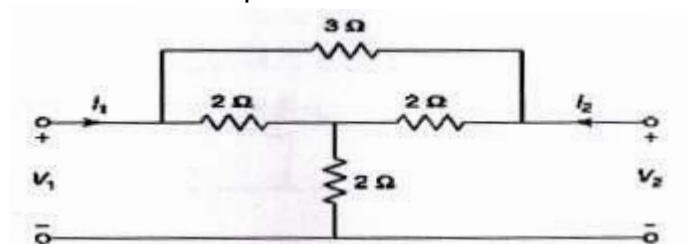
### Q.5 Attempt Any Two

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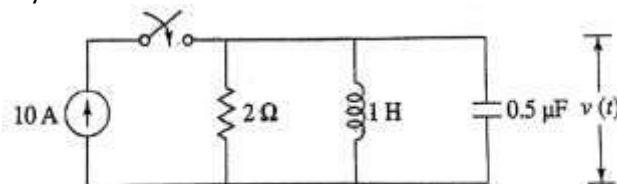
- a) In the network of fig. the switch is moved from a to b at  $t = 0$ . Determine  $i(t)$  and  $V_c(t)$  using Laplace transform.



- b) Find Y parameter for the two-port network shown.



- c) For the Network shown in Fig. Switch is closed at  $t = 0$ , determine  $v$ ,  $dv/dt$  and  $d^2v/dt^2$  at  $t = 0 +$



**Seat  
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## Max. Marks: 70

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

Marks: 14

14

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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

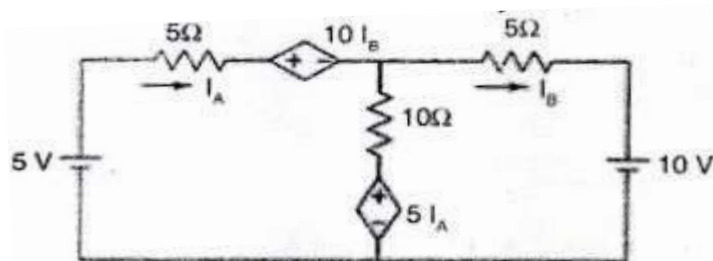
Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

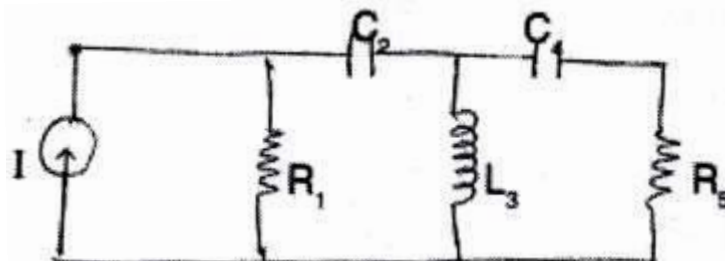
**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I****Q.2 Attempt any four.****16**

a) Obtain branch currents using mesh analysis.

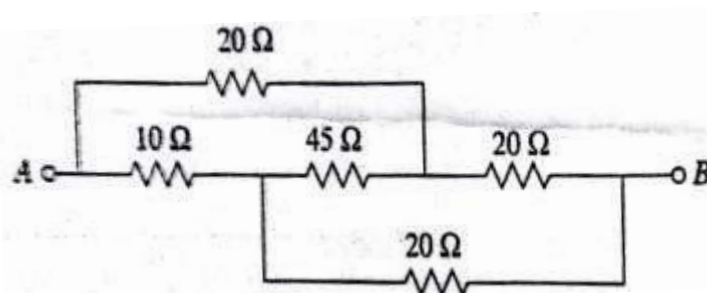


b) Draw the dual of the network.

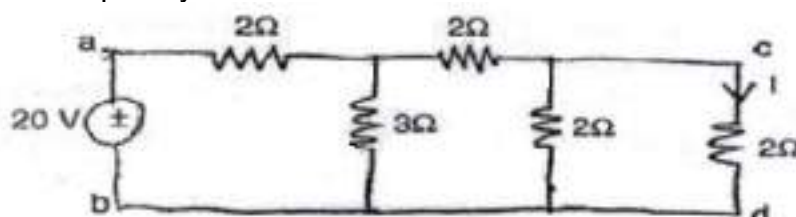


c) Derive the condition for Maximum power transfer.

d) Find the Equivalent Resistance between terminal A&amp;B.

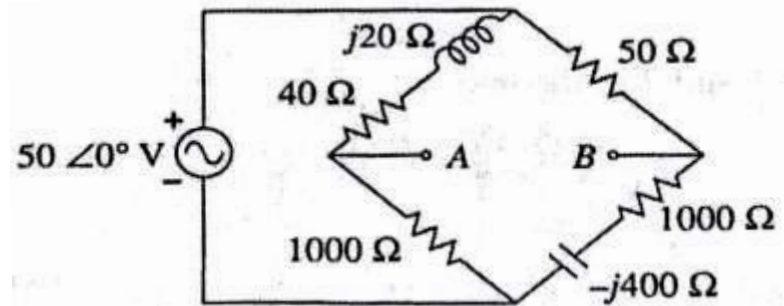


e) Verify the Reciprocity theorem for the network shown below

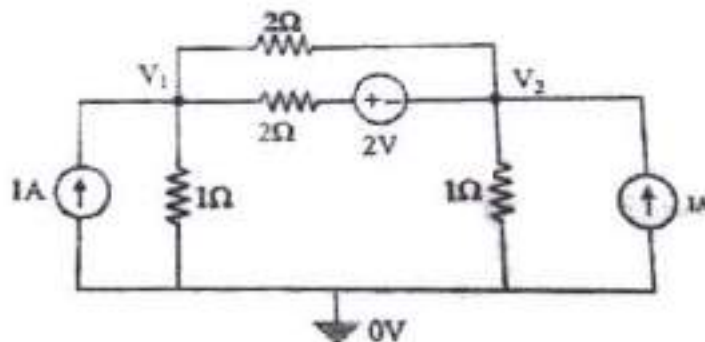


**Q.3 Attempt any two.**

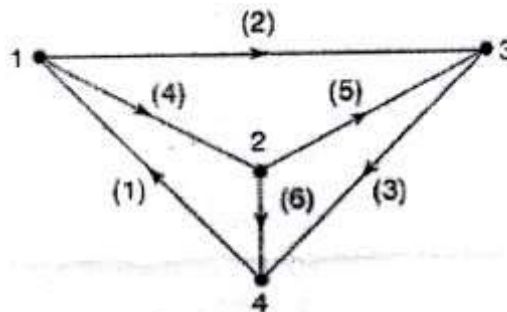
- a) Obtain the Thevenin's equivalent Network across terminals AB of the circuit shown in given figure.



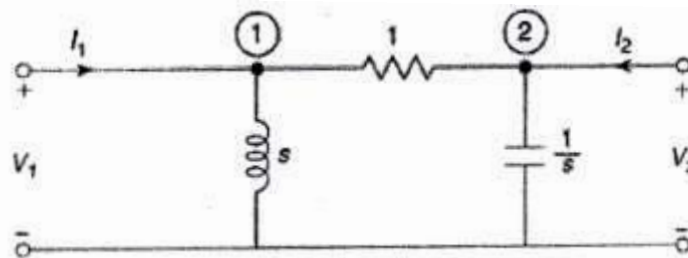
- b) Consider the following circuit, determine node voltages  $V_1$  and  $V_2$



- c) The graph of a network shown in fig. write a) Incidence matrix b) Tie set matrix c) Cut set matrix.

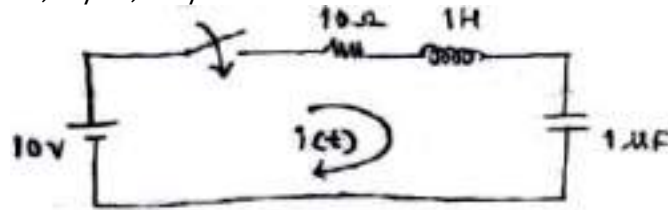
**Section II****Q.4 Attempt Any Four**

- a) Determine transmission parameters for the given network.

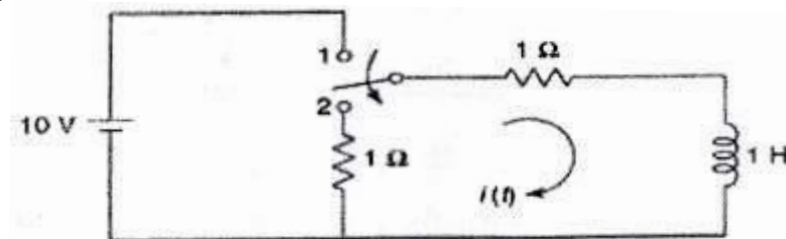


- b) Derive an expression for response given by RL circuit.

- c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find  $i$ ,  $di/dt$ ,  $d^2i/dt^2$  at  $t = 0 +$



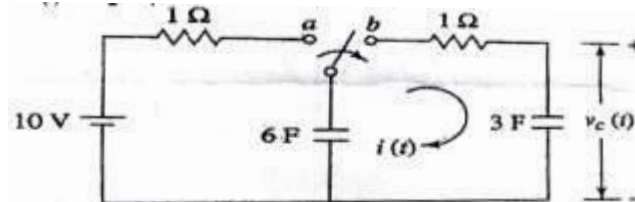
- d) Derive Y-Parameter in terms of Z parameters.  
 e) In the network shown in fig. the switch is moved from 1 to 2 at  $t = 0$ . Steady state condition having reached in position 1. Determine  $i(t)$  for  $t > 0$  using Laplace transforms.



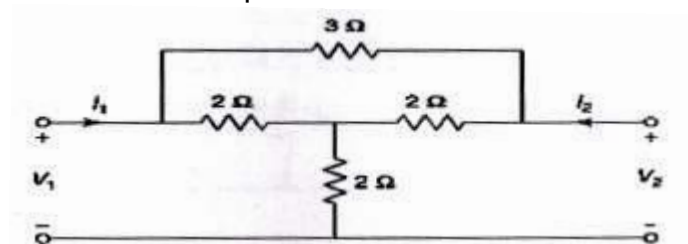
### Q.5 Attempt Any Two

12

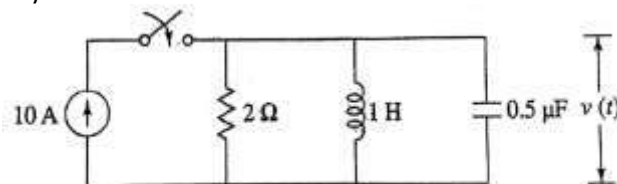
- a) In the network of fig. the switch is moved from a to b at  $t = 0$ . Determine  $i(t)$  and  $V_c(t)$  using Laplace transform.



- b) Find Y parameter for the two-port network shown.



- c) For the Network shown in Fig. Switch is closed at  $t = 0$ , determine  $v$ ,  $dv/dt$  and  $d^2v/dt^2$  at  $t = 0 +$



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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given options.**

**14**

- 1) The nodal method of circuit analysis is based on
  - a) KVL and ohms law
  - b) KCL and ohms law
  - c) KVL and KCL
  - d) KCL, KVL and ohms law
- 2) Superposition theorem is not applicable to network containing
  - a) nonlinear elements
  - b) dependent voltage source
  - c) dependent current source
  - d) Transformers
- 3) The time constant of RC circuit is \_\_\_\_\_.
 

|        |        |
|--------|--------|
| a) RC  | b) C/R |
| c) R/C | d) R   |
- 4) Laplace transform of a unit ramp function is \_\_\_\_\_.
 

|        |                     |
|--------|---------------------|
| a) 1   | b) s                |
| c) 1/s | d) 1/s <sup>2</sup> |
- 5) The value of impulse function for  $t > 0$ 

|                            |             |
|----------------------------|-------------|
| a) Zero                    | b) Unity    |
| c) K where k is a constant | d) Infinity |
- 6) A capacitor does not allow sudden changes in \_\_\_\_\_.
 

|                 |                  |
|-----------------|------------------|
| a) Currents     | b) Voltages      |
| c) both a and b | d) none of Above |
- 7) Transients are presents in the circuit when the circuit is having
 

|      |                    |
|------|--------------------|
| a) R | b) L               |
| c) C | d) either b) or c) |
- 8) For a 2-port network to be reciprocal, \_\_\_\_\_
 

|                       |                      |
|-----------------------|----------------------|
| a) $Z_{11} = Z_{22}$  | b) $Y_{21} = Y_{22}$ |
| c) $h_{21} = -h_{12}$ | d) $AD - BC = 0$     |

- 

- Page 17 of 20



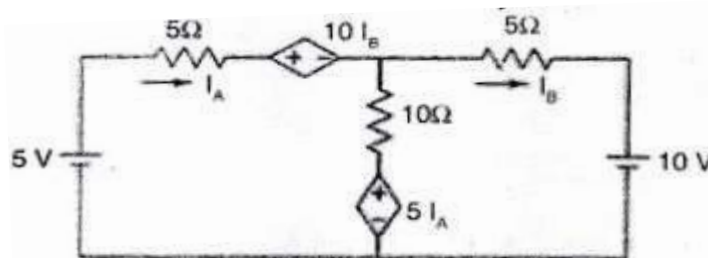
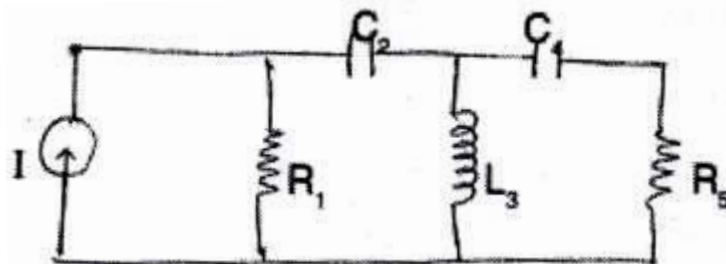
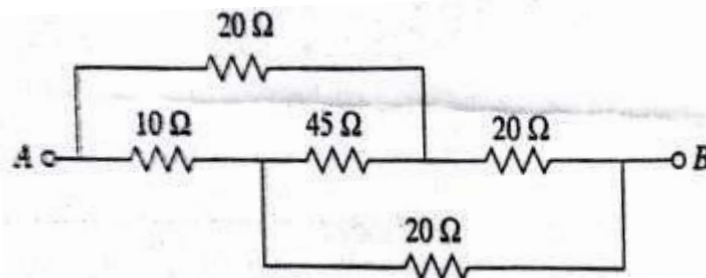
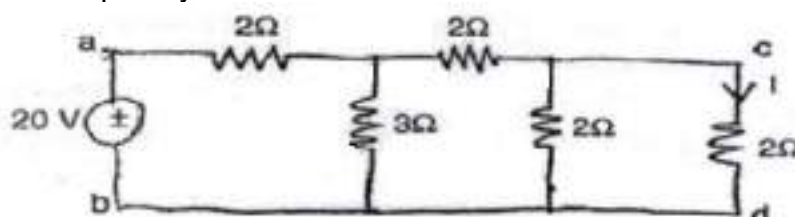
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**S.Y (B.Tech.) (Sem-II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

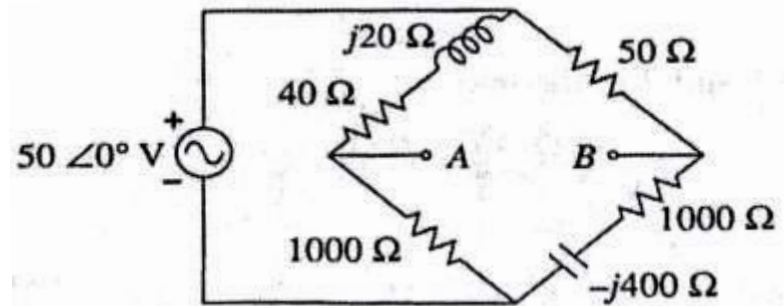
Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.

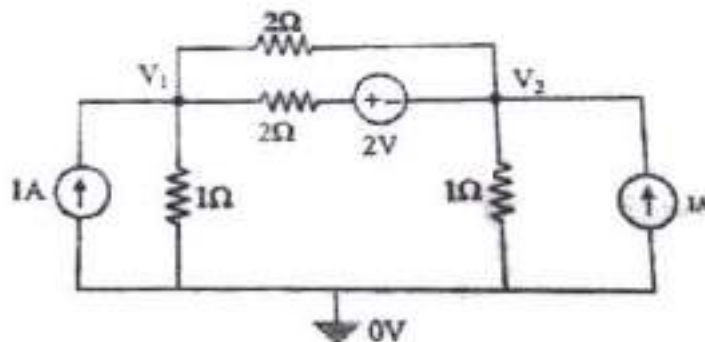
**Section – I****Q.2 Attempt any four.****16****a)** Obtain branch currents using mesh analysis.**b)** Draw the dual of the network.**c)** Derive the condition for Maximum power transfer.**d)** Find the Equivalent Resistance between terminal A&B.**e)** Verify the Reciprocity theorem for the network shown below

**Q.3 Attempt any two.**

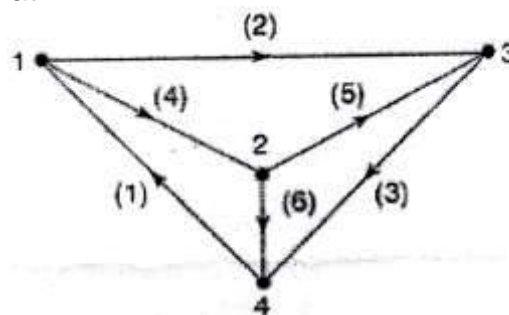
- a) Obtain the Thevenin's equivalent Network across terminals AB of the circuit shown in given figure.



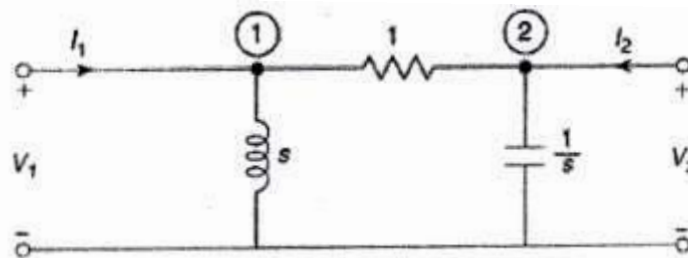
- b) Consider the following circuit, determine node voltages  $V_1$  and  $V_2$



- c) The graph of a network shown in fig. write a) Incidence matrix b) Tie set matrix c) Cut set matrix.

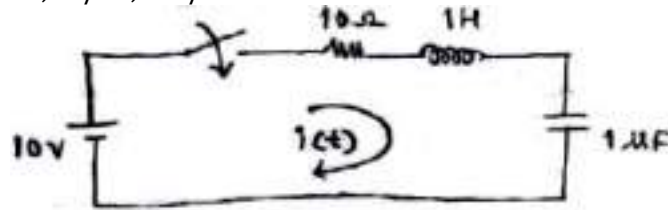
**Section II****Q.4 Attempt Any Four**

- a) Determine transmission parameters for the given network.

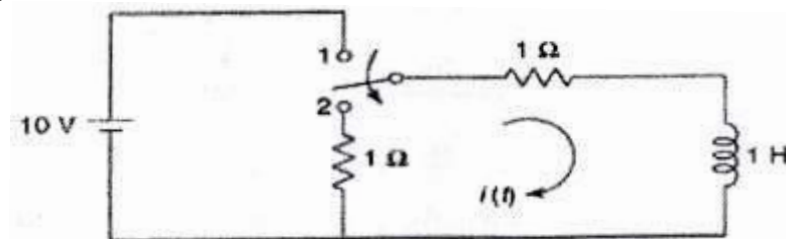


- b) Derive an expression for response given by RL circuit.

- c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find  $i$ ,  $di/dt$ ,  $d^2i/dt^2$  at  $t = 0 +$



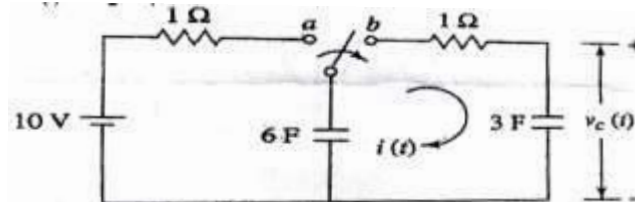
- d) Derive Y-Parameter in terms of Z parameters.  
 e) In the network shown in fig. the switch is moved from 1 to 2 at  $t = 0$ . Steady state condition having reached in position 1. Determine  $i(t)$  for  $t > 0$  using Laplace transforms.



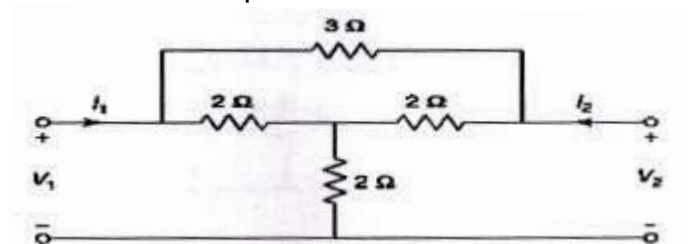
### Q.5 Attempt Any Two

12

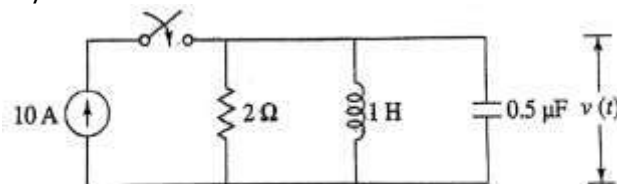
- a) In the network of fig. the switch is moved from a to b at  $t = 0$ . Determine  $i(t)$  and  $V_c(t)$  using Laplace transform.



- b) Find Y parameter for the two-port network shown.



- c) For the Network shown in Fig. Switch is closed at  $t = 0$ , determine  $v$ ,  $dv/dt$  and  $d^2v/dt^2$  at  $t = 0 +$



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In solving simultaneous linear equation which of the following method is iterative?
 

|                  |                 |
|------------------|-----------------|
| a) Factorisation | b) Jacobi       |
| c) Gauss-Seidel  | d) Both b and c |
- 2) Error in the Trapezoidal rule is of the order \_\_\_\_\_.
 

|          |          |
|----------|----------|
| a) $h^2$ | b) $h^3$ |
| c) $h^4$ | d) $h^5$ |
- 3) If  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  then Picard's first approximation is \_\_\_\_\_.
 

|                            |                            |
|----------------------------|----------------------------|
| a) $1 + x$                 | b) $x + \frac{x^3}{3}$     |
| c) $1 + x - \frac{x^3}{3}$ | d) $1 + x + \frac{x^3}{3}$ |
- 4) Romberg method is used to solve \_\_\_\_\_.
 

|                                    |                 |
|------------------------------------|-----------------|
| a) Ordinary differential equations | b) Integration  |
| c) Partial differential equations  | d) All of these |
- 5) The quantity K obtained by Runge-Kutta method of fourth order for differential equation  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  when  $h = 0.1$  is \_\_\_\_\_.
 

|        |         |
|--------|---------|
| a) 0.1 | b) 0    |
| c) 1   | d) 0.01 |
- 6) LU decomposition of matrix is possible only for \_\_\_\_\_.
 

|                      |                    |
|----------------------|--------------------|
| a) Invertible matrix | b) Singular matrix |
| c) Square matrix     | d) Ordered matrix  |
- 7) The order of convergence of Newton -Raphson method is \_\_\_\_\_.
 

|      |      |
|------|------|
| a) 3 | b) 2 |
| c) 1 | d) 0 |
- 8) If all eigen values are negative then the quadratic form  $X'AX$  is \_\_\_\_\_.
 

|                      |                      |
|----------------------|----------------------|
| a) Positive definite | b) Negative definite |
| c) Indefinite        | d) None              |

- 9)**  $\|v\| = \sqrt{v \cdot v}$
- a) True                                      b) False
- 10)** If  $u = \begin{bmatrix} 7 \\ 1 \end{bmatrix}, v = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$  then  $\|u - v\|$
- a)  $\sqrt{7}$                                       b)  $\sqrt{17}$   
c)  $\sqrt{71}$                                     d)  $\sqrt{70}$
- 11)** -2 is the eigen values of A where  $A = \begin{bmatrix} 2 & 4 & 3 \\ -4 & -6 & -3 \\ 3 & 3 & 1 \end{bmatrix}$
- a) True                                      b) False
- 12)** Let A be an  $n \times n$  invertible matrix then which of the following is not true \_\_\_\_\_
- a) The columns of A form a basis of  $R^n$   
b) The rows of A form a basis of  $R^n$   
c) Rank A = n  
d) NulA  $\neq \{0\}$
- 13)** If a system of equations has no free variables then it has \_\_\_\_\_.  
a) Unique solution                      b) No solution  
c) Infinite solution                      d) None
- 14)** Power method is used to find \_\_\_\_\_.  
a) Smallest eigen values              b) Zero Eigen values  
c) Largest eigen values                d) None

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Set **P**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Solve any three of the following.** **09**

- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  correct to three decimal places by Trapezoidal rule taking  $h = 0.25$
- Find a real root of the equation  $x \sin x + \cos x = 0$  by Newton Raphson method (Take  $x_0 = \pi$ )
- Find a double root of the equation  $f(x) = x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$
- Evaluate  $I = \int_0^1 \frac{x^2}{1+x^2} dx$  using Simpson's  $\frac{3}{8}$  th rule.
- Apply Runge-Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.2$  given that  $\frac{dy}{dx} = x + y$  and  $y(0) = 1$

**Q.3 Solve any three of the following.** **09**

- Solve the system by Gauss-Elimination method.  
 $x - y + z = 1, -3x - 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve by Picard's method  $\frac{dy}{dx} = 1 + xy$  and  $y(2) = 0$  up to third approximation.
- Find an iterative formula for  $\sqrt{N}$  (where  $N$  is a Positive number) and hence find  $\sqrt{5}$
- Solve by Gauss-Seidel method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$
- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  by Gaussian quadrature three-point formula.

**Q.4 Solve any two of the following.** **10**

- Apply factorisation method to solve the equations  
 $3x + 2y + 7z = 4, 2x + 3y + z = 5, 3x + 4y + z = 7$
- Evaluate  $I = \int_0^1 \frac{1}{1+x^2} dx$  using Romberg method, hence obtain an approximate value of  $\pi$
- Solve the differential equation  $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$  for  $x = 0.3$ . Using fourth order Runge-Kutta method and initial values are  $x = 0, y = 0, z = 1$ .

## Section II

09

**Q.5 Solve any three of the following.**

- a) Determine the rank of matrix A.

$$A = \begin{bmatrix} 2 & -3 & 6 & 5 \\ -2 & 3 & -3 & -4 \\ 4 & -6 & 5 & 9 \\ -2 & 3 & -4 & 1 \end{bmatrix}$$

- b) Find the bases for the row space of the matrix A.

$$A = \begin{bmatrix} -2 & -5 & 8 & 0 & -17 \\ 1 & 3 & -5 & 1 & 5 \\ 3 & 11 & -19 & 7 & 1 \\ 1 & 7 & -13 & 5 & -3 \end{bmatrix}$$

- c) Compute quadratic form
- $X'AX$
- for
- $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$
- and
- $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form  $X'AX$ 

- d) Determine whether the vectors are dependent or independent.

$$v_1 = \begin{bmatrix} 3 \\ 0 \\ -6 \end{bmatrix} \quad v_2 = \begin{bmatrix} -4 \\ 1 \\ 7 \end{bmatrix} \quad v_3 = \begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}$$

- e) Assume that T is linear transformation. Find standard matrix of
- $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$
- defined by
- $T(e_1) = (1,3)$
- $T(e_2) = (4,-7)$
- $T(e_3) = (-5,4)$

**Q.6 Solve any three of the following.**

09

- a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to

$$\text{Produce the orthonormal set } \mu = \begin{bmatrix} -2 \\ 3 \\ 1 \\ 3 \\ 2 \\ 3 \end{bmatrix} \quad v = \begin{bmatrix} 1 \\ 3 \\ 2 \\ 3 \\ 0 \end{bmatrix}$$

- b) Show that
- $\{v_1, v_2, v_3\}$
- is orthonormal basis for
- $\mathbb{R}^3$
- where

$$v_1 = \begin{bmatrix} \frac{1}{\sqrt{10}} \\ \frac{3}{\sqrt{20}} \\ \frac{3}{\sqrt{20}} \end{bmatrix} \quad v_2 = \begin{bmatrix} \frac{3}{\sqrt{10}} \\ \frac{-1}{\sqrt{20}} \\ \frac{-1}{\sqrt{20}} \end{bmatrix} \quad v_3 = \begin{bmatrix} 0 \\ \frac{-1}{\sqrt{20}} \\ \frac{1}{\sqrt{20}} \end{bmatrix}$$

- c) Describe all solutions of
- $AX = B$
- where
- $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & 8 \end{bmatrix}$
- $b = \begin{bmatrix} 7 \\ -1 \\ -4 \end{bmatrix}$

- d) Let
- $b_1 = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$
- ,
- $b_2 = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$
- ,
- $x = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$
- &
- $B = \{b_1, b_2\}$
- Find the co-ordinate vector
- $[X]_B$
- of X relative to B.

e) Let  $A = \begin{bmatrix} 2 & 4 & -2 & 1 \\ -2 & -5 & 7 & 3 \\ 3 & 7 & -8 & 6 \end{bmatrix}$  and  $u = \begin{bmatrix} 3 \\ -2 \\ -1 \\ 0 \end{bmatrix}$   $v = \begin{bmatrix} 3 \\ -1 \\ 3 \end{bmatrix}$

Is  $u$  in  $\text{Nul}A$ ?

Is  $v$  in  $\text{Col}A$ ?

**Q.7 Solve any two of the following.**

**10**

- a) Find the numerically largest eigen values of  $A$  by Power method.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

- b) If possible, diagonalize the matrix  $A$

$$A = \begin{bmatrix} 6 & -2 & -1 \\ -2 & 6 & -1 \\ -1 & -1 & 5 \end{bmatrix}$$

- c) Find the dimension of  $\text{Nul}A$  &  $\text{Col}A$  of matrix  $A$  where

$$A = \begin{bmatrix} 1 & 2 & -4 & 3 & 3 \\ 5 & 10 & -9 & -7 & 8 \\ 4 & 8 & -9 & -2 & 7 \\ -2 & -4 & 5 & 0 & 6 \end{bmatrix}$$



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If all eigen values are negative then the quadratic form  $X'AX$  is \_\_\_\_\_.  
 a) Positive definite                      b) Negative definite  
 c) Indefinite                                d) None
- 2)  $||v|| = \sqrt{v \cdot v}$   
 a) True                                        b) False
- 3) If  $u = \begin{bmatrix} 7 \\ 1 \end{bmatrix}$ ,  $v = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$  then  $||u - v||$   
 a)  $\sqrt{7}$                                         b)  $\sqrt{17}$   
 c)  $\sqrt{71}$                                         d)  $\sqrt{70}$
- 4) -2 is the eigen values of A where  $A = \begin{bmatrix} 2 & 4 & 3 \\ -4 & -6 & -3 \\ 3 & 3 & 1 \end{bmatrix}$   
 a) True                                        b) False
- 5) Let A be an  $n \times n$  invertible matrix then which of the following is not true \_\_\_\_\_.  
 a) The columns of A form a basis of  $R^n$   
 b) The rows of A form a basis of  $R^n$   
 c) Rank A = n  
 d)  $\text{Nul}A \neq \{0\}$
- 6) If a system of equations has no free variables then it has \_\_\_\_\_.  
 a) Unique solution                      b) No solution  
 c) Infinite solution                      d) None
- 7) Power method is used to find \_\_\_\_\_.  
 a) Smallest eigen values                b) Zero Eigen values  
 c) Largest eigen values                d) None
- 8) In solving simultaneous linear equation which of the following method is iterative?  
 a) Factorisation                            b) Jacobi  
 c) Gauss-Seidel                            d) Both b and c

- 9) Error in the Trapezoidal rule is of the order \_\_\_\_\_.  
a)  $h^2$  b)  $h^3$   
c)  $h^4$  d)  $h^5$
- 10) If  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  then Picard's first approximation is \_\_\_\_\_.  
a)  $1 + x$  b)  $x + \frac{x^3}{3}$   
c)  $1 + x - \frac{x^3}{3}$  d)  $1 + x + \frac{x^3}{3}$
- 11) Romberg method is used to solve \_\_\_\_\_.  
a) Ordinary differential equations b) Integration  
c) Partial differential equations d) All of these
- 12) The quantity K obtained by Runge-Kutta method of fourth order for differential equation  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  when  $h = 0.1$  is \_\_\_\_\_.  
a) 0.1 b) 0  
c) 1 d) 0.01
- 13) LU decomposition of matrix is possible only for \_\_\_\_\_.  
a) Invertible matrix b) Singular matrix  
c) Square matrix d) Ordered matrix
- 14) The order of convergence of Newton -Raphson method is \_\_\_\_\_.  
a) 3 b) 2  
c) 1 d) 0

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Set **Q**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Solve any three of the following.** **09**

- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  correct to three decimal places by Trapezoidal rule taking  $h = 0.25$
- Find a real root of the equation  $x \sin x + \cos x = 0$  by Newton Raphson method (Take  $x_0 = \pi$ )
- Find a double root of the equation  $f(x) = x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$
- Evaluate  $I = \int_0^1 \frac{x^2}{1+x^2} dx$  using Simpson's  $\frac{3}{8}$  th rule.
- Apply Runge-Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.2$  given that  $\frac{dy}{dx} = x + y$  and  $y(0) = 1$

**Q.3 Solve any three of the following.** **09**

- Solve the system by Gauss-Elimination method.  
 $x - y + z = 1, -3x - 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve by Picard's method  $\frac{dy}{dx} = 1 + xy$  and  $y(2) = 0$  up to third approximation.
- Find an iterative formula for  $\sqrt{N}$  (where  $N$  is a Positive number) and hence find  $\sqrt{5}$
- Solve by Gauss-Seidel method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$
- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  by Gaussian quadrature three-point formula.

**Q.4 Solve any two of the following.** **10**

- Apply factorisation method to solve the equations  
 $3x + 2y + 7z = 4, 2x + 3y + z = 5, 3x + 4y + z = 7$
- Evaluate  $I = \int_0^1 \frac{1}{1+x^2} dx$  using Romberg method, hence obtain an approximate value of  $\pi$
- Solve the differential equation  $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$  for  $x = 0.3$ . Using fourth order Runge-Kutta method and initial values are  $x = 0, y = 0, z = 1$ .

## Section II

09

**Q.5 Solve any three of the following.****a)** Determine the rank of matrix A.

$$A = \begin{bmatrix} 2 & -3 & 6 & 5 \\ -2 & 3 & -3 & -4 \\ 4 & -6 & 5 & 9 \\ -2 & 3 & -4 & 1 \end{bmatrix}$$

**b)** Find the bases for the row space of the matrix A.

$$A = \begin{bmatrix} -2 & -5 & 8 & 0 & -17 \\ 1 & 3 & -5 & 1 & 5 \\ 3 & 11 & -19 & 7 & 1 \\ 1 & 7 & -13 & 5 & -3 \end{bmatrix}$$

**c)** Compute quadratic form  $X'AX$  for  $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$  and  $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ Also find eigen values of quadratic form  $X'AX$ **d)** Determine whether the vectors are dependent or independent.

$$v_1 = \begin{bmatrix} 3 \\ 0 \\ -6 \end{bmatrix} \quad v_2 = \begin{bmatrix} -4 \\ 1 \\ 7 \end{bmatrix} \quad v_3 = \begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}$$

**e)** Assume that T is linear transformation. Find standard matrix of  $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$  defined by  $T(e_1) = (1,3)$   $T(e_2) = (4,-7)$   $T(e_3) = (-5,4)$ **Q.6 Solve any three of the following.**

09

**a)** Determine whether the vectors are orthogonal if orthogonal Normalize the vector to

$$\text{Produce the orthonormal set } \mu = \begin{bmatrix} -2 \\ 3 \\ 1 \\ 3 \\ 2 \\ \frac{1}{3} \end{bmatrix} \quad v = \begin{bmatrix} 1 \\ 3 \\ 2 \\ 3 \\ 0 \end{bmatrix}$$

**b)** Show that  $\{v_1, v_2, v_3\}$  is orthonormal basis for  $\mathbb{R}^3$  where

$$v_1 = \begin{bmatrix} \frac{1}{\sqrt{10}} \\ \frac{3}{\sqrt{20}} \\ \frac{3}{\sqrt{20}} \end{bmatrix} \quad v_2 = \begin{bmatrix} \frac{3}{\sqrt{10}} \\ \frac{-1}{\sqrt{20}} \\ \frac{-1}{\sqrt{20}} \end{bmatrix} \quad v_3 = \begin{bmatrix} 0 \\ \frac{-1}{\sqrt{20}} \\ \frac{1}{\sqrt{20}} \end{bmatrix}$$

**c)** Describe all solutions of  $AX = B$  where  $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & 8 \end{bmatrix}$   $b = \begin{bmatrix} 7 \\ -1 \\ -4 \end{bmatrix}$ **d)** Let  $b_1 = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$ ,  $b_2 = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$ ,  $x = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$  &  $B = \{b_1, b_2\}$  Find the co-ordinate vector  $[X]_B$  of X relative to B.

e) Let  $A = \begin{bmatrix} 2 & 4 & -2 & 1 \\ -2 & -5 & 7 & 3 \\ 3 & 7 & -8 & 6 \end{bmatrix}$  and  $u = \begin{bmatrix} 3 \\ -2 \\ -1 \\ 0 \end{bmatrix}$   $v = \begin{bmatrix} 3 \\ -1 \\ 3 \end{bmatrix}$

Is  $u$  is in NulA?

Is  $v$  is in ColA?

**Q.7 Solve any two of the following.**

**10**

- a) Find the numerically largest eigen values of A by Power method.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

- b) If possible, diagonalize the matrix A

$$A = \begin{bmatrix} 6 & -2 & -1 \\ -2 & 6 & -1 \\ -1 & -1 & 5 \end{bmatrix}$$

- c) Find the dimension of NulA & ColA of matrix A where

$$A = \begin{bmatrix} 1 & 2 & -4 & 3 & 3 \\ 5 & 10 & -9 & -7 & 8 \\ 4 & 8 & -9 & -2 & 7 \\ -2 & -4 & 5 & 0 & 6 \end{bmatrix}$$

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Day & Date: Tuesday, 14-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Use of non-programmable calculator is allowed.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) -2 is the eigen values of A where  $A = \begin{bmatrix} 2 & 4 & 3 \\ -4 & -6 & -3 \\ 3 & 3 & 1 \end{bmatrix}$ 
  - a) True
  - b) False
- 2) Let A be an  $n \times n$  invertible matrix then which of the following is not true \_\_\_\_\_
  - a) The columns of A form a basis of  $R^n$
  - b) The rows of A form a basis of  $R^n$
  - c) Rank A = n
  - d)  $\text{Nul}A \neq \{0\}$
- 3) If a system of equations has no free variables then it has \_\_\_\_\_.
  - a) Unique solution
  - b) No solution
  - c) Infinite solution
  - d) None
- 4) Power method is used to find \_\_\_\_\_.
  - a) Smallest eigen values
  - b) Zero Eigen values
  - c) Largest eigen values
  - d) None
- 5) In solving simultaneous linear equation which of the following method is iterative?
  - a) Factorisation
  - b) Jacobi
  - c) Gauss-Seidel
  - d) Both b and c
- 6) Error in the Trapezoidal rule is of the order \_\_\_\_\_.
  - a)  $h^2$
  - b)  $h^3$
  - c)  $h^4$
  - d)  $h^5$
- 7) If  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  then Picard's first approximation is \_\_\_\_\_.
  - a)  $1 + x$
  - b)  $x + \frac{x^3}{3}$
  - c)  $1 + x - \frac{x^3}{3}$
  - d)  $1 + x + \frac{x^3}{3}$

- 8) Romberg method is used to solve \_\_\_\_\_.  
a) Ordinary differential equations    b) Integration  
c) Partial differential equations    d) All of these
- 9) The quantity K obtained by Runge-Kutta method of fourth order for differential equation  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  when  $h = 0.1$  is \_\_\_\_\_.  
a) 0.1    b) 0  
c) 1    d) 0.01
- 10) LU decomposition of matrix is possible only for \_\_\_\_\_.  
a) Invertible matrix    b) Singular matrix  
c) Square matrix    d) Ordered matrix
- 11) The order of convergence of Newton -Raphson method is \_\_\_\_\_.  
a) 3    b) 2  
c) 1    d) 0
- 12) If all eigen values are negative then the quadratic form  $X'AX$  is \_\_\_\_\_.  
a) Positive definite    b) Negative definite  
c) Indefinite    d) None
- 13)  $||v|| = \sqrt{v \cdot v}$   
a) True    b) False
- 14) If  $u = \begin{bmatrix} 7 \\ 1 \end{bmatrix}$ ,  $v = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$  then  $\|u - v\|$   
a)  $\sqrt{7}$     b)  $\sqrt{17}$   
c)  $\sqrt{71}$     d)  $\sqrt{70}$

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Set **R**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Solve any three of the following.** **09**

- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  correct to three decimal places by Trapezoidal rule taking  $h = 0.25$
- Find a real root of the equation  $x \sin x + \cos x = 0$  by Newton Raphson method (Take  $x_0 = \pi$ )
- Find a double root of the equation  $f(x) = x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$
- Evaluate  $I = \int_0^1 \frac{x^2}{1+x^2} dx$  using Simpson's  $\frac{3}{8}$  th rule.
- Apply Runge-Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.2$  given that  $\frac{dy}{dx} = x + y$  and  $y(0) = 1$

**Q.3 Solve any three of the following.** **09**

- Solve the system by Gauss-Elimination method.  
 $x - y + z = 1, -3x - 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve by Picard's method  $\frac{dy}{dx} = 1 + xy$  and  $y(2) = 0$  up to third approximation.
- Find an iterative formula for  $\sqrt{N}$  (where  $N$  is a Positive number) and hence find  $\sqrt{5}$
- Solve by Gauss-Seidel method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$
- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  by Gaussian quadrature three-point formula.

**Q.4 Solve any two of the following.** **10**

- Apply factorisation method to solve the equations  
 $3x + 2y + 7z = 4, 2x + 3y + z = 5, 3x + 4y + z = 7$
- Evaluate  $I = \int_0^1 \frac{1}{1+x^2} dx$  using Romberg method, hence obtain an approximate value of  $\pi$
- Solve the differential equation  $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$  for  $x = 0.3$ . Using fourth order Runge-Kutta method and initial values are  $x = 0, y = 0, z = 1$ .



## Section II

09

**Q.5 Solve any three of the following.****a)** Determine the rank of matrix A.

$$A = \begin{bmatrix} 2 & -3 & 6 & 5 \\ -2 & 3 & -3 & -4 \\ 4 & -6 & 5 & 9 \\ -2 & 3 & -4 & 1 \end{bmatrix}$$

**b)** Find the bases for the row space of the matrix A.

$$A = \begin{bmatrix} -2 & -5 & 8 & 0 & -17 \\ 1 & 3 & -5 & 1 & 5 \\ 3 & 11 & -19 & 7 & 1 \\ 1 & 7 & -13 & 5 & -3 \end{bmatrix}$$

**c)** Compute quadratic form  $X'AX$  for  $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$  and  $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ Also find eigen values of quadratic form  $X'AX$ **d)** Determine whether the vectors are dependent or independent.

$$v_1 = \begin{bmatrix} 3 \\ 0 \\ -6 \end{bmatrix} \quad v_2 = \begin{bmatrix} -4 \\ 1 \\ 7 \end{bmatrix} \quad v_3 = \begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}$$

**e)** Assume that T is linear transformation. Find standard matrix of  $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$  defined by  $T(e_1) = (1,3)$   $T(e_2) = (4,-7)$   $T(e_3) = (-5,4)$ **Q.6 Solve any three of the following.**

09

**a)** Determine whether the vectors are orthogonal if orthogonal Normalize the vector to

$$\text{Produce the orthonormal set } \mu = \begin{bmatrix} -2 \\ 3 \\ 1 \\ 3 \\ 2 \\ 3 \end{bmatrix} \quad v = \begin{bmatrix} 1 \\ 3 \\ 2 \\ 3 \\ 0 \end{bmatrix}$$

**b)** Show that  $\{v_1, v_2, v_3\}$  is orthonormal basis for  $\mathbb{R}^3$  where

$$v_1 = \begin{bmatrix} \frac{1}{\sqrt{10}} \\ \frac{3}{\sqrt{20}} \\ \frac{3}{\sqrt{20}} \end{bmatrix} \quad v_2 = \begin{bmatrix} \frac{3}{\sqrt{10}} \\ \frac{-1}{\sqrt{20}} \\ \frac{-1}{\sqrt{20}} \end{bmatrix} \quad v_3 = \begin{bmatrix} 0 \\ \frac{-1}{\sqrt{20}} \\ \frac{1}{\sqrt{20}} \end{bmatrix}$$

**c)** Describe all solutions of  $AX = B$  where  $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & 8 \end{bmatrix}$   $b = \begin{bmatrix} 7 \\ -1 \\ -4 \end{bmatrix}$ **d)** Let  $b_1 = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$ ,  $b_2 = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$ ,  $x = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$  &  $B = \{b_1, b_2\}$  Find the co-ordinate vector  $[X]_B$  of X relative to B.

e) Let  $A = \begin{bmatrix} 2 & 4 & -2 & 1 \\ -2 & -5 & 7 & 3 \\ 3 & 7 & -8 & 6 \end{bmatrix}$  and  $u = \begin{bmatrix} 3 \\ -2 \\ -1 \\ 0 \end{bmatrix}$   $v = \begin{bmatrix} 3 \\ -1 \\ 3 \end{bmatrix}$

Is  $u$  in  $\text{Nul}A$ ?

Is  $v$  in  $\text{Col}A$ ?

**Q.7 Solve any two of the following.**

**10**

- a) Find the numerically largest eigen values of  $A$  by Power method.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

- b) If possible, diagonalize the matrix  $A$

$$A = \begin{bmatrix} 6 & -2 & -1 \\ -2 & 6 & -1 \\ -1 & -1 & 5 \end{bmatrix}$$

- c) Find the dimension of  $\text{Nul}A$  &  $\text{Col}A$  of matrix  $A$  where

$$A = \begin{bmatrix} 1 & 2 & -4 & 3 & 3 \\ 5 & 10 & -9 & -7 & 8 \\ 4 & 8 & -9 & -2 & 7 \\ -2 & -4 & 5 & 0 & 6 \end{bmatrix}$$

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Set **S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) LU decomposition of matrix is possible only for \_\_\_\_\_.  
 a) Invertible matrix                      b) Singular matrix  
 c) Square matrix                          d) Ordered matrix
- 2) The order of convergence of Newton -Raphson method is \_\_\_\_\_.  
 a) 3                                              b) 2  
 c) 1                                              d) 0
- 3) If all eigen values are negative then the quadratic form  $X'AX$  is \_\_\_\_\_.  
 a) Positive definite                      b) Negative definite  
 c) Indefinite                              d) None
- 4)  $\|v\| = \sqrt{v \cdot v}$   
 a) True                                          b) False
- 5) If  $u = \begin{bmatrix} 7 \\ 1 \end{bmatrix}$ ,  $v = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$  then  $\|u - v\|$   
 a)  $\sqrt{7}$                                           b)  $\sqrt{17}$   
 c)  $\sqrt{71}$                                           d)  $\sqrt{70}$
- 6) -2 is the eigen values of A where  $A = \begin{bmatrix} 2 & 4 & 3 \\ -4 & -6 & -3 \\ 3 & 3 & 1 \end{bmatrix}$   
 a) True                                          b) False
- 7) Let A be an  $n \times n$  invertible matrix then which of the following is not true \_\_\_\_\_.  
 a) The columns of A form a basis of  $R^n$   
 b) The rows of A form a basis of  $R^n$   
 c) Rank A = n  
 d)  $\text{Nul}A \neq \{0\}$
- 8) If a system of equations has no free variables then it has \_\_\_\_\_.  
 a) Unique solution                      b) No solution  
 c) Infinite solution                      d) None

- 9) Power method is used to find \_\_\_\_\_.  
a) Smallest eigen values                      b) Zero Eigen values  
c) Largest eigen values                      d) None
- 10) In solving simultaneous linear equation which of the following method is iterative?  
a) Factorisation                                      b) Jacobi  
c) Gauss-Seidel                                      d) Both b and c
- 11) Error in the Trapezoidal rule is of the order \_\_\_\_\_.  
a)  $h^2$                                                       b)  $h^3$   
c)  $h^4$                                                       d)  $h^5$
- 12) If  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  then Picard's first approximation is \_\_\_\_\_.  
a)  $1 + x$                                                       b)  $x + \frac{x^3}{3}$   
c)  $1 + x - \frac{x^3}{3}$                                                       d)  $1 + x + \frac{x^3}{3}$
- 13) Romberg method is used to solve \_\_\_\_\_.  
a) Ordinary differential equations              b) Integration  
c) Partial differential equations              d) All of these
- 14) The quantity K obtained by Runge-Kutta method of fourth order for differential equation  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  when  $h = 0.1$  is \_\_\_\_\_.  
a) 0.1                                                      b) 0  
c) 1                                                      d) 0.01

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Set **S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) Figures to the right indicates full marks.  
 2) Use of non-programmable calculator is allowed.

**Section – I**

**Q.2 Solve any three of the following.** **09**

- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  correct to three decimal places by Trapezoidal rule taking  $h = 0.25$
- Find a real root of the equation  $x \sin x + \cos x = 0$  by Newton Raphson method (Take  $x_0 = \pi$ )
- Find a double root of the equation  $f(x) = x^3 - x^2 - x + 1 = 0$  choosing  $x_0 = 0.8$
- Evaluate  $I = \int_0^1 \frac{x^2}{1+x^2} dx$  using Simpson's  $\frac{3}{8}$  th rule.
- Apply Runge-Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.2$  given that  $\frac{dy}{dx} = x + y$  and  $y(0) = 1$

**Q.3 Solve any three of the following.** **09**

- Solve the system by Gauss-Elimination method.  
 $x - y + z = 1, -3x - 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve by Picard's method  $\frac{dy}{dx} = 1 + xy$  and  $y(2) = 0$  up to third approximation.
- Find an iterative formula for  $\sqrt{N}$  (where  $N$  is a Positive number) and hence find  $\sqrt{5}$
- Solve by Gauss-Seidel method  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$
- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  by Gaussian quadrature three-point formula.

**Q.4 Solve any two of the following.** **10**

- Apply factorisation method to solve the equations  
 $3x + 2y + 7z = 4, 2x + 3y + z = 5, 3x + 4y + z = 7$
- Evaluate  $I = \int_0^1 \frac{1}{1+x^2} dx$  using Romberg method, hence obtain an approximate value of  $\pi$
- Solve the differential equation  $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$  for  $x = 0.3$ . Using fourth order Runge-Kutta method and initial values are  $x = 0, y = 0, z = 1$ .

## Section II

09

**Q.5 Solve any three of the following.****a)** Determine the rank of matrix A.

$$A = \begin{bmatrix} 2 & -3 & 6 & 5 \\ -2 & 3 & -3 & -4 \\ 4 & -6 & 5 & 9 \\ -2 & 3 & -4 & 1 \end{bmatrix}$$

**b)** Find the bases for the row space of the matrix A.

$$A = \begin{bmatrix} -2 & -5 & 8 & 0 & -17 \\ 1 & 3 & -5 & 1 & 5 \\ 3 & 11 & -19 & 7 & 1 \\ 1 & 7 & -13 & 5 & -3 \end{bmatrix}$$

**c)** Compute quadratic form  $X'AX$  for  $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$  and  $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ Also find eigen values of quadratic form  $X'AX$ **d)** Determine whether the vectors are dependent or independent.

$$v_1 = \begin{bmatrix} 3 \\ 0 \\ -6 \end{bmatrix} \quad v_2 = \begin{bmatrix} -4 \\ 1 \\ 7 \end{bmatrix} \quad v_3 = \begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}$$

**e)** Assume that T is linear transformation. Find standard matrix of  $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$  defined by  $T(e_1) = (1,3)$   $T(e_2) = (4,-7)$   $T(e_3) = (-5,4)$ **Q.6 Solve any three of the following.**

09

**a)** Determine whether the vectors are orthogonal if orthogonal Normalize the vector to

$$\text{Produce the orthonormal set } \mu = \begin{bmatrix} -2 \\ 3 \\ 1 \\ 3 \\ 2 \\ \frac{1}{3} \end{bmatrix} \quad v = \begin{bmatrix} 1 \\ 3 \\ 2 \\ 3 \\ 0 \end{bmatrix}$$

**b)** Show that  $\{v_1, v_2, v_3\}$  is orthonormal basis for  $\mathbb{R}^3$  where

$$v_1 = \begin{bmatrix} \frac{1}{\sqrt{10}} \\ \frac{3}{\sqrt{20}} \\ \frac{3}{\sqrt{20}} \end{bmatrix} \quad v_2 = \begin{bmatrix} \frac{3}{\sqrt{10}} \\ \frac{-1}{\sqrt{20}} \\ \frac{-1}{\sqrt{20}} \end{bmatrix} \quad v_3 = \begin{bmatrix} 0 \\ \frac{-1}{\sqrt{20}} \\ \frac{1}{\sqrt{20}} \end{bmatrix}$$

**c)** Describe all solutions of  $AX = B$  where  $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & 8 \end{bmatrix}$   $b = \begin{bmatrix} 7 \\ -1 \\ -4 \end{bmatrix}$ **d)** Let  $b_1 = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$ ,  $b_2 = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$ ,  $x = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$  &  $B = \{b_1, b_2\}$  Find the co-ordinate vector  $[X]_B$  of X relative to B.

e) Let  $A = \begin{bmatrix} 2 & 4 & -2 & 1 \\ -2 & -5 & 7 & 3 \\ 3 & 7 & -8 & 6 \end{bmatrix}$  and  $u = \begin{bmatrix} 3 \\ -2 \\ -1 \\ 0 \end{bmatrix}$   $v = \begin{bmatrix} 3 \\ -1 \\ 3 \end{bmatrix}$

Is  $u$  is in NulA?

Is  $v$  is in ColA?

**Q.7 Solve any two of the following.**

**10**

- a) Find the numerically largest eigen values of A by Power method.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

- b) If possible, diagonalize the matrix A

$$A = \begin{bmatrix} 6 & -2 & -1 \\ -2 & 6 & -1 \\ -1 & -1 & 5 \end{bmatrix}$$

- c) Find the dimension of NulA & ColA of matrix A where

$$A = \begin{bmatrix} 1 & 2 & -4 & 3 & 3 \\ 5 & 10 & -9 & -7 & 8 \\ 4 & 8 & -9 & -2 & 7 \\ -2 & -4 & 5 & 0 & 6 \end{bmatrix}$$

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Set **P**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Vehicle Technology**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.****14**

- 1) HEV stands for
  - a) Hybrid Electronic Vehicle
  - b) Hybrid Electrical vehicle
  - c) Hybrid Environmental Vehicle
  - d) None of the above
- 2) When was the first electric car invented?
  - a) 1830
  - b) 1985
  - c) 1832
  - d) 1945
- 3) What is the challenge with electric vehicles?
  - a) Vehicle durability
  - b) Cell life
  - c) Cost
  - d) Both A and B
- 4) Electric Vehicles are generally powered by \_\_\_\_\_.
  - a) Aluminium batteries
  - b) Lead-acid batteries
  - c) Sodium batteries
  - d) Magnesium batteries
- 5) Life of a battery in the electric vehicle is about \_\_\_\_\_.
  - a) 8 years
  - b) 5 years
  - c) 10 years
  - d) 20 years
- 6) Full form of EV is \_\_\_\_\_.
  - a) Energy voltage
  - b) Electric vehicles
  - c) Electric voltage
  - d) Energy vehicles
- 7) The rate of change of momentum with respect to time is measured in
  - a) kg ms<sup>-2</sup>
  - b) kg ms<sup>-1</sup>
  - c) kg m
  - d) kg
- 8) When unbalanced forces act on a body, the body \_\_\_\_\_.
  - a) Must move with uniform velocity.
  - b) Must remain at rest.
  - c) Must experience acceleration.
  - d) Must move in a curved path.
- 9) How many known modes of charging of EVs are available?
  - a) 3
  - b) 2
  - c) 4
  - d) 1



- 10)** Newton's third law of motion explains the two forces namely 'action' and 'reaction' coming into action when the two bodies are in contact with each other. These two forces:
- a) Always act on the same body
  - b) Always act on the different bodies in opposite directions
  - c) Have the same magnitude and direction
  - d) Acts on either body at normal to each other
- 11)** The seat belts are provided in the cars so that if the car stops suddenly due to an emergency braking, the persons sitting on the front seats are not thrown forward violently and saved from getting injured. Can you guess the law due to which a person falls in the forward direction on the sudden stopping of the car?
- a) Newton's first law of motion
  - b) Newton's second law of motion
  - c) Newton's third law of motion
  - d) Newton's law of gravitation
- 12)** Which of the following is NOT the type of Hybrid Vehicle \_\_\_\_\_?
- a) Plug-in Hybrid
  - b) Parallel Hybrid
  - c) Natural Gas for Vehicles
  - d) Series Hybrid
- 13)** "In this system, the engine is used to supply electrical power to the motor, which then turns the wheels" Select the type of Hybrid System according to above description.
- a) Series Hybrid
  - b) Parallel Hybrid
  - c) Plug-in Hybrid
  - d) Series-parallel Hybrid
- 14)** Which vehicle has the smallest number of principle components?
- a) Traditional vehicle
  - b) Hybrid vehicle
  - c) Electric vehicle
  - d) Both A and B

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**Set P**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Vehicle Technology**

Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What is meant by an electric vehicle?
- b) Explain about the history of electric vehicle?
- c) Explain about the social and environmental importance of EV?
- d) What are the supporting systems in an electric vehicle?
- e) What are the advantages & disadvantages of electric vehicles?

**Q.3 Solve any two:** **12**

- a) Explain all law of motion in details?
- b) Write brief note on vehicle dynamics.
- c) Explain the following terms.
  - 1) Propulsion Power
  - 2) Motion
  - 3) Speed
  - 4) velocity

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain the components of HEV and its types?
- b) With the help of block diagram explain battery management supporting system of HEV?
- c) Explain the different power flow control modes of a typical parallel hybrid system with the help of block diagrams?
- d) Explain the benefits of Solar powered charging system?
- e) Explain the fuel efficiency analysis of hybrid drive train and electric drive trains?

**Q.5 Solve any Two.** **12**

- a) Explain the operation, the advantages & disadvantages of flywheel energy storage?
- b) Explain the working of fuel cell and state its limitations?
- c) Explain the fundamentals of regenerative braking system used in HEV?

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Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Marks: 14

14

- Page 4 of 12

- 7) Which vehicle has the smallest number of principle components?  
a) Traditional vehicle                      b) Hybrid vehicle  
c) Electric vehicle                          d) Both A and B
- 8) HEV stands for  
a) Hybrid Electronic Vehicle              b) Hybrid Electrical vehicle  
c) Hybrid Environmental Vehicle        d) None of the above
- 9) When was the first electric car invented?  
a) 1830                                          b) 1985  
c) 1832                                          d) 1945
- 10) What is the challenge with electric vehicles?  
a) Vehicle durability                      b) Cell life  
c) Cost                                          d) Both A and B
- 11) Electric Vehicles are generally powered by \_\_\_\_\_.  
a) Aluminium batteries                      b) Lead-acid batteries  
c) Sodium batteries d                      d) Magnesium batteries
- 12) Life of a battery in the electric vehicle is about \_\_\_\_\_.  
a) 8 years                                          b) 5 years  
c) 10 years                                        d) 20 years
- 13) Full form of EV is \_\_\_\_\_.  
a) Energy voltage                              b) Electric vehicles  
c) Electric voltage                            d) Energy vehicles
- 14) The rate of change of momentum with respect to time is measured in  
a)  $\text{kg ms}^{-2}$                                       b)  $\text{kg ms}^{-1}$   
c)  $\text{kg m}$                                           d)  $\text{kg}$

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Vehicle Technology**

Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What is meant by an electric vehicle?
- b) Explain about the history of electric vehicle?
- c) Explain about the social and environmental importance of EV?
- d) What are the supporting systems in an electric vehicle?
- e) What are the advantages & disadvantages of electric vehicles?

**Q.3 Solve any two:** **12**

- a) Explain all law of motion in details?
- b) Write brief note on vehicle dynamics.
- c) Explain the following terms.
  - 1) Propulsion Power
  - 2) Motion
  - 3) Speed
  - 4) velocity

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain the components of HEV and its types?
- b) With the help of block diagram explain battery management supporting system of HEV?
- c) Explain the different power flow control modes of a typical parallel hybrid system with the help of block diagrams?
- d) Explain the benefits of Solar powered charging system?
- e) Explain the fuel efficiency analysis of hybrid drive train and electric drive trains?

**Q.5 Solve any Two.** **12**

- a) Explain the operation, the advantages & disadvantages of flywheel energy storage?
- b) Explain the working of fuel cell and state its limitations?
- c) Explain the fundamentals of regenerative braking system used in HEV?

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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Vehicle Technology**

Day & Date: Thursday, 16-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The seat belts are provided in the cars so that if the car stops suddenly due to an emergency braking, the persons sitting on the front seats are not thrown forward violently and saved from getting injured. Can you guess the law due to which a person falls in the forward direction on the sudden stopping of the car?
 

|                                 |                                  |
|---------------------------------|----------------------------------|
| a) Newton's first law of motion | b) Newton's second law of motion |
| c) Newton's third law of motion | d) Newton's law of gravitation   |
- 2) Which of the following is NOT the type of Hybrid Vehicle \_\_\_\_\_?
 

|                             |                    |
|-----------------------------|--------------------|
| a) Plug-in Hybrid           | b) Parallel Hybrid |
| c) Natural Gas for Vehicles | d) Series Hybrid   |
- 3) "In this system, the engine is used to supply electrical power to the motor, which then turns the wheels" Select the type of Hybrid System according to above description.
 

|                   |                           |
|-------------------|---------------------------|
| a) Series Hybrid  | b) Parallel Hybrid        |
| c) Plug-in Hybrid | d) Series-parallel Hybrid |
- 4) Which vehicle has the smallest number of principle components?
 

|                        |                   |
|------------------------|-------------------|
| a) Traditional vehicle | b) Hybrid vehicle |
| c) Electric vehicle    | d) Both A and B   |
- 5) HEV stands for
 

|                                 |                              |
|---------------------------------|------------------------------|
| a) Hybrid Electronic Vehicle    | b) Hybrid Electrical vehicle |
| c) Hybrid Environmental Vehicle | d) None of the above         |
- 6) When was the first electric car invented?
 

|         |         |
|---------|---------|
| a) 1830 | b) 1985 |
| c) 1832 | d) 1945 |
- 7) What is the challenge with electric vehicles?
 

|                       |                 |
|-----------------------|-----------------|
| a) Vehicle durability | b) Cell life    |
| c) Cost               | d) Both A and B |
- 8) Electric Vehicles are generally powered by \_\_\_\_\_.
 

|                        |                        |
|------------------------|------------------------|
| a) Aluminium batteries | b) Lead-acid batteries |
| c) Sodium batteries    | d) Magnesium batteries |



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**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Vehicle Technology**

Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What is meant by an electric vehicle?
- b) Explain about the history of electric vehicle?
- c) Explain about the social and environmental importance of EV?
- d) What are the supporting systems in an electric vehicle?
- e) What are the advantages & disadvantages of electric vehicles?

**Q.3 Solve any two:** **12**

- a) Explain all law of motion in details?
- b) Write brief note on vehicle dynamics.
- c) Explain the following terms.
  - 1) Propulsion Power
  - 2) Motion
  - 3) Speed
  - 4) velocity

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain the components of HEV and its types?
- b) With the help of block diagram explain battery management supporting system of HEV?
- c) Explain the different power flow control modes of a typical parallel hybrid system with the help of block diagrams?
- d) Explain the benefits of Solar powered charging system?
- e) Explain the fuel efficiency analysis of hybrid drive train and electric drive trains?

**Q.5 Solve any Two.** **12**

- a) Explain the operation, the advantages & disadvantages of flywheel energy storage?
- b) Explain the working of fuel cell and state its limitations?
- c) Explain the fundamentals of regenerative braking system used in HEV?



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Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Full form of EV is \_\_\_\_\_.  
a) Energy voltage                      b) Electric vehicles  
c) Electric voltage                  d) Energy vehicles
- 2) The rate of change of momentum with respect to time is measured in  
a) kg ms-2                                b) kg ms-1  
c) kg m                                     d) kg
- 3) When unbalanced forces act on a body, the body \_\_\_\_\_.  
a) Must move with uniform velocity.  
b) Must remain at rest.  
c) Must experience acceleration.  
d) Must move in a curved path.
- 4) How many known modes of charging of EVs are available?  
a) 3                                          b) 2  
c) 4                                          d) 1
- 5) Newton's third law of motion explains the two forces namely 'action' and 'reaction' coming into action when the two bodies are in contact with each other. These two forces:  
a) Always act on the same body  
b) Always act on the different bodies in opposite directions  
c) Have the same magnitude and direction  
d) Acts on either body at normal to each other
- 6) The seat belts are provided in the cars so that if the car stops suddenly due to an emergency braking, the persons sitting on the front seats are not thrown forward violently and saved from getting injured. Can you guess the law due to which a person falls in the forward direction on the sudden stopping of the car?  
a) Newton's first law of motion        b) Newton's second law of motion  
c) Newton's third law of motion       d) Newton's law of gravitation

- 7) Which of the following is NOT the type of Hybrid Vehicle \_\_\_\_\_?
- a) Plug-in Hybrid
  - b) Parallel Hybrid
  - c) Natural Gas for Vehicles
  - d) Series Hybrid
- 8) "In this system, the engine is used to supply electrical power to the motor, which then turns the wheels" Select the type of Hybrid System according to above description.
- a) Series Hybrid
  - b) Parallel Hybrid
  - c) Plug-in Hybrid
  - d) Series-parallel Hybrid
- 9) Which vehicle has the smallest number of principle components?
- a) Traditional vehicle
  - b) Hybrid vehicle
  - c) Electric vehicle
  - d) Both A and B
- 10) HEV stands for
- a) Hybrid Electronic Vehicle
  - b) Hybrid Electrical vehicle
  - c) Hybrid Environmental Vehicle
  - d) None of the above
- 11) When was the first electric car invented?
- a) 1830
  - b) 1985
  - c) 1832
  - d) 1945
- 12) What is the challenge with electric vehicles?
- a) Vehicle durability
  - b) Cell life
  - c) Cost
  - d) Both A and B
- 13) Electric Vehicles are generally powered by \_\_\_\_\_.
- a) Aluminium batteries
  - b) Lead-acid batteries
  - c) Sodium batteries
  - d) Magnesium batteries
- 14) Life of a battery in the electric vehicle is about \_\_\_\_\_.
- a) 8 years
  - b) 5 years
  - c) 10 years
  - d) 20 years

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**Set S**

**S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electric Vehicle Technology**

Day & Date: Thursday, 16-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Solve any four.** **16**

- a) What is meant by an electric vehicle?
- b) Explain about the history of electric vehicle?
- c) Explain about the social and environmental importance of EV?
- d) What are the supporting systems in an electric vehicle?
- e) What are the advantages & disadvantages of electric vehicles?

**Q.3 Solve any two:** **12**

- a) Explain all law of motion in details?
- b) Write brief note on vehicle dynamics.
- c) Explain the following terms.
  - 1) Propulsion Power
  - 2) Motion
  - 3) Speed
  - 4) velocity

**Section II**

**Q.4 Solve any four.** **16**

- a) Explain the components of HEV and its types?
- b) With the help of block diagram explain battery management supporting system of HEV?
- c) Explain the different power flow control modes of a typical parallel hybrid system with the help of block diagrams?
- d) Explain the benefits of Solar powered charging system?
- e) Explain the fuel efficiency analysis of hybrid drive train and electric drive trains?

**Q.5 Solve any Two.** **12**

- a) Explain the operation, the advantages & disadvantages of flywheel energy storage?
- b) Explain the working of fuel cell and state its limitations?
- c) Explain the fundamentals of regenerative braking system used in HEV?

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P

**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option:**

**14**

- 1) For a p-pole machine, which of the following statements are correct regarding the rotating field speed?
  - a)  $1/(p/2)$  revolutions in one cycle
  - b)  $f/(p/2)$  revolutions in f cycles
  - c)  $f/(p/2)$  revolutions in one second
  - d) Any of the mentioned
- 2) Under which of the following starting methods an induction motor draws high starting currents?
  - a) Star-delta starter
  - b) Auto transformer starter
  - c) Direct online starter
  - d) Reduced voltage starter
- 3) A 10 kW, 50 Hz, 3-phase induction motor develops the rated torque at 1440 rpm. If the load torque is reduced to half, then the motor speed is \_\_\_\_\_.
  - a) 1470 rpm
  - b) 1410 rpm
  - c) 1400 rpm
  - d) 1444 rpm
- 4) In a blocked rotor test on an induction motor, the mechanical output of the motor is \_\_\_\_\_.
  - a) zero
  - b) moderate
  - c) very low
  - d) none of the above
- 5) In the circle diagram for I.M. the diameter of the circle represents \_\_\_\_\_.
  - a) Slip
  - b) Rotor current
  - c) Running torque
  - d) Line voltage
- 6) If induction motor is direct switched-on then it will develop \_\_\_\_\_.
  - a) 1.5 times their full load torque
  - b) 1.5 to 2.5 times their full load torque
  - c) 2.5 times their full load torque
  - d) 1.5 to 5 times their full load torque

- 7) The relation between maximum torque and full load torque ( $T_{\max}$ ,  $T_f$  respectively) when referred to induction motor is given by \_\_\_\_\_.  
 a)  $T_f/T_{\max} = 2a/(a^2 + s^2)$                       b)  $T_f/T_{\max} = 2/(a^2 + s^2)$   
 c)  $T_f/T_{\max} = 2as/(a^2 + s^2)$                       d)  $T_f/T_{\max} = a/(a^2 + s^2)$
- 8) Which of the following motors has highest starting torque?  
 a) Repulsion motor                      b) Shaped pole motor  
 c) Capacitor-start motor                      d) Split-phase motor
- 9) In a capacitor start motor, the phase displacement between starting and running winding can be nearly \_\_\_\_\_.  
 a)  $10^\circ$                       b)  $30^\circ$   
 c)  $60^\circ$                       d)  $90^\circ$
- 10) Potier method is very accurate due to \_\_\_\_\_.  
 a) emfs are handled as voltage and mmf as AT  
 b) emf and mmf are handled as AT  
 c) emf and mmf are handled as voltage  
 d) none of the mentioned
- 11) A 3-phase alternator has 3 slots per pole. The distribution factor of the winding is \_\_\_\_\_.  
 a) 0.866                      b) 0.5  
 c) 1                      d) none of the above
- 12) When the load on an alternator is varied, its terminal voltage also changes due to \_\_\_\_\_.  
 a) armature reaction                      b) leakage reactance  
 c) armature resistance                      d) all of the mentioned
- 13) A three-phase synchronous motor will have \_\_\_\_\_.  
 a) no slip-rings                      b) one slip-ring  
 c) two slip-rings                      d) three slip-rings
- 14) Voltage regulation for an alternator operating at leading power factor is negative due to \_\_\_\_\_.  
 a) magnetizing nature of armature reaction  
 b) demagnetizing nature of armature reaction  
 c) cross-magnetizing nature of armature reaction  
 d) all of the mentioned

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four of the following:**

**16**

- a) Derive  $P_i : P_c : P_m : 1 : s : (1-s)$  where  $P_i$ =Rotor input;  $P_c$ =Rotor Cu loss and  $P_m$  = Mechanical power developed.
- b) With a neat vector diagram, explain the production of rotating magnetic field in 3- Induction Motor.
- c) Derive the condition for Max torque in case of 3 Ph Induction Motor.
- d) Explain a) Construction and Working of double cage IM  
       b) Equivalent circuit of double cage IM
- e) A squirrel cage type induction motor when started by means of a star/Delta starter takes 180% of full load line current and develops 35% of full load torque at starting calculate the starting torque and current in terms of full load values, if an autotransformer with 75% tapping were employed.
- f) What are the different methods of speed control of induction motors explain with neat diagram the rotor rheostat control method?

**Q.3 Attempt any two of the following:**

**12**

- a) Describe with circuit diagram the working of 1) Autotransformer starter  
       2) Rotor resistance starter
- b) Explain the procedure to construct a circle diagram for IM from no load and blocked rotor test data and mark output line and torque line on diagram.
- c) A 75 kW, 440 V, 3-phase, 6-pole, 50 Hz wound rotor induction motor has a full load slip of 0.04 and the slip at maximum torque of 0.2 when operating at rated voltage and frequency with rotor winding short circuited at the slip rings. Assume the stator resistance and rotational losses to be negligible. Find (a) maximum torque (b) starting torque (c) full load copper loss. The rotor resistance is now doubled by adding an external series resistance. Determine (d) slip at full load (e) full-load torque (f) slip at maximum torque.

**Section – II****Q.4 Attempt any four of the following:****16**

- a) Explain the operation of split phase induction motor.
- b) Explain cross field theory of single-phase induction motor.
- c) What is an armature reaction? Explain its effect on the terminal voltage of an alternator at unity pf.
- d) Derive EMF equation of alternator with short pitched coils and distributed windings.
- e) Explain the operation of synchronous motor with constant load and over excitation with phasor diagram.
- f) State and explain different losses in synchronous motor.

**Q.5 Attempt any two of the following:****12**

- a) What are conditions of parallel operation of alternator? Explain parallel operation of alternator.
- b) Explain EMF method of calculating voltage regulation of an alternator.
- c) Derive an expression for the power developed per phase of a synchronous motor.

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option:**

**14**

- 1) Which of the following motors has highest starting torque?
 

|                          |                      |
|--------------------------|----------------------|
| a) Repulsion motor       | b) Shaped pole motor |
| c) Capacitor-start motor | d) Split-phase motor |
- 2) In a capacitor start motor, the phase displacement between starting and running winding can be nearly \_\_\_\_\_.
 

|        |        |
|--------|--------|
| a) 10° | b) 30° |
| c) 60° | d) 90° |
- 3) Potier method is very accurate due to \_\_\_\_\_.
 

|                                              |
|----------------------------------------------|
| a) emfs are handled as voltage and mmf as AT |
| b) emf and mmf are handled as AT             |
| c) emf and mmf are handled as voltage        |
| d) none of the mentioned                     |
- 4) A 3-phase alternator has 3 slots per pole. The distribution factor of the winding is \_\_\_\_\_.
 

|          |                      |
|----------|----------------------|
| a) 0.866 | b) 0.5               |
| c) 1     | d) none of the above |
- 5) When the load on an alternator is varied, its terminal voltage also changes due to \_\_\_\_\_.
 

|                        |                         |
|------------------------|-------------------------|
| a) armature reaction   | b) leakage reactance    |
| c) armature resistance | d) all of the mentioned |
- 6) A three-phase synchronous motor will have \_\_\_\_\_.
 

|                   |                     |
|-------------------|---------------------|
| a) no slip-rings  | b) one slip-ring    |
| c) two slip-rings | d) three slip-rings |
- 7) Voltage regulation for an alternator operating at leading power factor is negative due to \_\_\_\_\_.
 

|                                                  |
|--------------------------------------------------|
| a) magnetizing nature of armature reaction       |
| b) demagnetizing nature of armature reaction     |
| c) cross-magnetizing nature of armature reaction |
| d) all of the mentioned                          |



- 8) For a p-pole machine, which of the following statements are correct regarding the rotating field speed?
- $1/(p/2)$  revolutions in one cycle
  - $f/(p/2)$  revolutions in f cycles
  - $f/(p/2)$  revolutions in one second
  - Any of the mentioned
- 9) Under which of the following starting methods an induction motor draws high starting currents?
- Star-delta starter
  - Auto transformer starter
  - Direct online starter
  - Reduced voltage starter
- 10) A 10 kW, 50 Hz, 3-phase induction motor develops the rated torque at 1440 rpm. If the load torque is reduced to half, then the motor speed is \_\_\_\_\_
- 1470 rpm
  - 1410 rpm
  - 1400 rpm
  - 1444 rpm
- 11) In a blocked rotor test on an induction motor, the mechanical output of the motor is \_\_\_\_\_
- zero
  - moderate
  - very low
  - none of the above
- 12) In the circle diagram for I.M. the diameter of the circle represents \_\_\_\_\_
- Slip
  - Rotor current
  - Running torque
  - Line voltage
- 13) If induction motor is direct switched-on then it will develop \_\_\_\_\_
- 1.5 times their full load torque
  - 1.5 to 2.5 times their full load torque
  - 2.5 times their full load torque
  - 1.5 to 5 times their full load torque
- 14) The relation between maximum torque and full load torque ( $T_{\max}$ ,  $T_f$  respectively) when referred to induction motor is given by \_\_\_\_\_
- $T_f/T_{\max} = 2a/(a^2 + s^2)$
  - $T_f/T_{\max} = 2/(a^2 + s^2)$
  - $T_f/T_{\max} = 2as/(a^2 + s^2)$
  - $T_f/T_{\max} = a/(a^2 + s^2)$

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Day & Date: Monday, 06-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Q.2 Attempt any four of the following:**

- Derive  $P_i : P_c : P_m : 1 : s : (1-s)$  where  $P_i$ =Rotor input;  $P_c$ =Rotor Cu loss and  $P_m$  = Mechanical power developed.
- With a neat vector diagram, explain the production of rotating magnetic field in 3- Induction Motor.
- Derive the condition for Max torque in case of 3 Ph Induction Motor.
- Explain a) Construction and Working of double cage IM  
b) Equivalent circuit of double cage IM
- A squirrel cage type induction motor when started by means of a star/Delta starter takes 180% of full load line current and develops 35% of full load torque at starting calculate the starting torque and current in terms of full load values, if an autotransformer with 75% tapping were employed.
- What are the different methods of speed control of induction motors explain with neat diagram the rotor rheostat control method?

**Q.3 Attempt any two of the following:**

- Describe with circuit diagram the working of 1) Autotransformer starter  
2) Rotor resistance starter
- Explain the procedure to construct a circle diagram for IM from no load and blocked rotor test data and mark output line and torque line on diagram.
- A 75 kW, 440 V, 3-phase, 6-pole, 50 Hz wound rotor induction motor has a full load slip of 0.04 and the slip at maximum torque of 0.2 when operating at rated voltage and frequency with rotor winding short circuited at the slip rings. Assume the stator resistance and rotational losses to be negligible. Find (a) maximum torque (b) starting torque (c) full load copper loss. The rotor resistance is now doubled by adding an external series resistance. Determine (d) slip at full load (e) full-load torque (f) slip at maximum torque.

**Section – II**

- Q.4 Attempt any four of the following:** **16**
- a) Explain the operation of split phase induction motor.
  - b) Explain cross field theory of single-phase induction motor.
  - c) What is an armature reaction? Explain its effect on the terminal voltage of an alternator at unity pf.
  - d) Derive EMF equation of alternator with short pitched coils and distributed windings.
  - e) Explain the operation of synchronous motor with constant load and over excitation with phasor diagram.
  - f) State and explain different losses in synchronous motor.
- Q.5 Attempt any two of the following:** **12**
- a) What are conditions of parallel operation of alternator? Explain parallel operation of alternator.
  - b) Explain EMF method of calculating voltage regulation of an alternator.
  - c) Derive an expression for the power developed per phase of a synchronous motor.

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Day & Date: Monday, 06-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:**

- 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 9 of 16



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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

**Q.2 Attempt any four of the following:**

**16**

- Derive  $P_i : P_c : P_m : 1 : s : (1-s)$  where  $P_i$ =Rotor input;  $P_c$ =Rotor Cu loss and  $P_m$  = Mechanical power developed.
- With a neat vector diagram, explain the production of rotating magnetic field in 3- Induction Motor.
- Derive the condition for Max torque in case of 3 Ph Induction Motor.
- Explain a) Construction and Working of double cage IM  
 b) Equivalent circuit of double cage IM
- A squirrel cage type induction motor when started by means of a star/Delta starter takes 180% of full load line current and develops 35% of full load torque at starting calculate the starting torque and current in terms of full load values, if an autotransformer with 75% tapping were employed.
- What are the different methods of speed control of induction motors explain with neat diagram the rotor rheostat control method?

**Q.3 Attempt any two of the following:**

**12**

- Describe with circuit diagram the working of 1) Autotransformer starter  
 2) Rotor resistance starter
- Explain the procedure to construct a circle diagram for IM from no load and blocked rotor test data and mark output line and torque line on diagram.
- A 75 kW, 440 V, 3-phase, 6-pole, 50 Hz wound rotor induction motor has a full load slip of 0.04 and the slip at maximum torque of 0.2 when operating at rated voltage and frequency with rotor winding short circuited at the slip rings. Assume the stator resistance and rotational losses to be negligible. Find (a) maximum torque (b) starting torque (c) full load copper loss. The rotor resistance is now doubled by adding an external series resistance. Determine (d) slip at full load (e) full-load torque (f) slip at maximum torque.

**Section – II**

**Q.4 Attempt any four of the following:** **16**

- a) Explain the operation of split phase induction motor.
- b) Explain cross field theory of single-phase induction motor.
- c) What is an armature reaction? Explain its effect on the terminal voltage of an alternator at unity pf.
- d) Derive EMF equation of alternator with short pitched coils and distributed windings.
- e) Explain the operation of synchronous motor with constant load and over excitation with phasor diagram.
- f) State and explain different losses in synchronous motor.

**Q.5 Attempt any two of the following:** **12**

- a) What are conditions of parallel operation of alternator? Explain parallel operation of alternator.
- b) Explain EMF method of calculating voltage regulation of an alternator.
- c) Derive an expression for the power developed per phase of a synchronous motor.

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**S.Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Electrical Machines - II**

Day & Date: Monday, 06-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the given option: 14**

- 1) If induction motor is direct switched-on then it will develop \_\_\_\_
  - a) 1.5 times their full load torque
  - b) 1.5 to 2.5 times their full load torque
  - c) 2.5 times their full load torque
  - d) 1.5 to 5 times their full load torque
- 2) The relation between maximum torque and full load torque ( $T_{\max}$ ,  $T_f$  respectively) when referred to induction motor is given by \_\_\_\_
  - a)  $T_f / T_{\max} = 2a / (a^2 + s^2)$
  - b)  $T_f / T_{\max} = 2 / (a^2 + s^2)$
  - c)  $T_f / T_{\max} = 2as / (a^2 + s^2)$
  - d)  $T_f / T_{\max} = a / (a^2 + s^2)$
- 3) Which of the following motors has highest starting torque?
  - a) Repulsion motor
  - b) Shaped pole motor
  - c) Capacitor-start motor
  - d) Split-phase motor
- 4) In a capacitor start motor, the phase displacement between starting and running winding can be nearly \_\_\_\_\_.
  - a)  $10^\circ$
  - b)  $30^\circ$
  - c)  $60^\circ$
  - d)  $90^\circ$
- 5) Potier method is very accurate due to \_\_\_\_\_.
  - a) emfs are handled as voltage and mmf as AT
  - b) emf and mmf are handled as AT
  - c) emf and mmf are handled as voltage
  - d) none of the mentioned
- 6) A 3-phase alternator has 3 slots per pole. The distribution factor of the winding is \_\_\_\_\_.
  - a) 0.866
  - b) 0.5
  - c) 1
  - d) none of the above
- 7) When the load on an alternator is varied, its terminal voltage also changes due to \_\_\_\_\_.
  - a) armature reaction
  - b) leakage reactance
  - c) armature resistance
  - d) all of the mentioned





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Day & Date: Monday, 06-03-2023  
Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All question are compulsory.  
2) Figures to the right indicates full marks.

**Q.2 Attempt any four of the following:**

- a) Derive  $P_i : P_c : P_m : 1 : s : (1-s)$  where  $P_i$ =Rotor input;  $P_c$ =Rotor Cu loss and  $P_m$  = Mechanical power developed.
- b) With a neat vector diagram, explain the production of rotating magnetic field in 3- Induction Motor.
- c) Derive the condition for Max torque in case of 3 Ph Induction Motor.
- d) Explain a) Construction and Working of double cage IM  
b) Equivalent circuit of double cage IM
- e) A squirrel cage type induction motor when started by means of a star/Delta starter takes 180% of full load line current and develops 35% of full load torque at starting calculate the starting torque and current in terms of full load values, if an autotransformer with 75% tapping were employed.
- f) What are the different methods of speed control of induction motors explain with neat diagram the rotor rheostat control method?

**Q.3 Attempt any two of the following:**

- Describe with circuit diagram the working of 1) Autotransformer starter  
2) Rotor resistance starter
- Explain the procedure to construct a circle diagram for IM from no load and blocked rotor test data and mark output line and torque line on diagram.
- A 75 kW, 440 V, 3-phase, 6-pole, 50 Hz wound rotor induction motor has a full load slip of 0.04 and the slip at maximum torque of 0.2 when operating at rated voltage and frequency with rotor winding short circuited at the slip rings. Assume the stator resistance and rotational losses to be negligible. Find (a) maximum torque (b) starting torque (c) full load copper loss. The rotor resistance is now doubled by adding an external series resistance. Determine (d) slip at full load (e) full-load torque (f) slip at maximum torque.

**Section – II**

**Q.4 Attempt any four of the following:** **16**

- a) Explain the operation of split phase induction motor.
- b) Explain cross field theory of single-phase induction motor.
- c) What is an armature reaction? Explain its effect on the terminal voltage of an alternator at unity pf.
- d) Derive EMF equation of alternator with short pitched coils and distributed windings.
- e) Explain the operation of synchronous motor with constant load and over excitation with phasor diagram.
- f) State and explain different losses in synchronous motor.

**Q.5 Attempt any two of the following:** **12**

- a) What are conditions of parallel operation of alternator? Explain parallel operation of alternator.
- b) Explain EMF method of calculating voltage regulation of an alternator.
- c) Derive an expression for the power developed per phase of a synchronous motor.

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The corona is considerably affected by which of the following \_\_\_\_\_  
 a) Size of the conductor  
 b) Shape of the conductor  
 c) Surface condition of the conductor  
 d) All of the above
- 2) Corona usually occurs when the electrostatic stress in the air around the conductor succeeds \_\_\_\_\_  
 a) 30 kV (maximum value)/cm      b) 22 kV (maximum value)/cm  
 c) 11 kV (rms value)/cm      d) 6.6 kV (rms value)/cm
- 3) A conductor, due to sag between two supports, takes the form of \_\_\_\_\_  
 a) semi-circle      b) catenary  
 c) triangle      d) ellipse
- 4) In a cable immediately above metallic sheath \_\_\_\_\_ is provided.  
 a) Earthing connection      b) Bedding  
 c) Armouring      d) None of the above
- 5) The process of achieving uniformity in the dielectric stress by using layers of different dielectrics is known as \_\_\_\_\_.  
 a) Stranding process      b) Grading of cables  
 c) Stress distribution      d) Capacitance grading
- 6) The thickness of the layer of insulation on the conductor, in cables, depends upon \_\_\_\_\_  
 a) Reactive power      b) Power factor  
 c) Voltage      d) Current carrying capacity
- 7) The conductor carries more current on the surface in comparison to its core. This phenomenon is called the \_\_\_\_\_.  
 a) Corona      b) Ferranti effect  
 c) Lenz's effect      d) Skin effect

- 8) 310 km line is considered as \_\_\_\_\_  
a) a long transmission line      b) a medium transmission line  
c) a short transmission line      d) any of the above
- 9) In any transmission line  $AD - BC =$  \_\_\_\_\_?  
a) 1      b) 0  
c) 2      d) 3
- 10) The values of A, B, C and D constants for a short transmission line are respectively \_\_\_\_\_  
a) Z, 0, 1 and 1      b) 0, 1, 1 and Z  
c) 1, Z, 0 and 1      d) 1, 1, Z and 0
- 11) Feeder is designed mainly from the point of view of \_\_\_\_\_  
a) Its current carrying capacity      b) Voltage drop in it  
c) Operating voltage      d) Operating Frequency
- 12) A \_\_\_\_\_ distribution system is more reliable than the \_\_\_\_\_ distribution System.  
a) parallel, ring      b) radial, parallel  
c) parallel, radial      d) ring, parallel
- 13) In a substation the following equipment is not installed \_\_\_\_\_  
a) Exciters      b) Series capacitors  
c) Shunt reactors      d) Voltage transformers
- 14) Which of the following are the methods of grounding?  
a) Resistance      b) Reactance  
c) Solid      d) All of these

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Set **P**

**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Solve Any Four.****16**

- What is corona? Explain the factors affecting corona.
- A single core cable has a conductor diameter of 2.5 cm & insulation of thickness of 1.2 cm. If the specific resistance of insulation is  $4.5 \times 10^{14} \Omega$  cm, calculate the insulation resistance per kilometer length of cable.
- Explain the concept of GMR & GMD.
- A 132 KV transmission line has the following details:  
 weight of conductor = 680 kg/km, length of span = 260 m,  
 ultimate strength = 3100 kg, safety factor = 2.  
 Calculate the height above the ground at which the conductor should be supported. Ground clearance required is 10 m.
- Explain in detail skin effect & proximity effect.
- Write short note on dielectric stress in single core cable.

**Q.3 Attempt any Two.****12**

- The tower of height 30 m and 90 m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500 m. If the tension in the conductor is 1600 kg, find the minimum clearance of the conductor and water and clearance midway between the supports. Weight of conductor is 1.5 kg/m. Bases of the towers can be considered to be at water level.
- Derive the expression for inductance of 3-ph single circuit overhead triangular configuration of transmission line for equilateral spacing.
- Explain the following methods of cable grading:  
 i) Capacitance grading ii) Intersheath grading

**Section – II****Q.4 Attempt any Four.****16**

- Derive an expression for voltage regulation and efficiency of short transmission line along with the equivalent circuit and phasor diagram.
- Explain different equipment used in substation.
- Write short note on connection schemes of distribution systems.
- A 3-phase, 50 Hz, overhead transmission line delivers 10 MW at 0.8 p.f lagging and at 66 KV. The resistance & inductive reactance of line per phase are  $10\Omega$  &  $20\Omega$  respectively while capacitive admittance is  $4 \times 10^{-4}$  siemen. Calculate sending voltage (line-to-line) & sending end power factor using nominal T Method.

- e) Draw and explain concentrated loaded DC distributor fed at one end.
- f) Write short note on reactance grounding.

**Q.5 Attempt any two.****12**

- a) A single-phase overhead transmission line delivers 1000 kW at 10 KV at 0.85 p.f. lagg. The total resistance and inductive reactance of the line are  $2\ \Omega$  and  $3\ \Omega$  respectively.  
Determine:
  - 1) Sending end voltage
  - 2) Voltage regulation
  - 3) Transmission Efficiency
- b) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal  $\pi$  method.
- c) A 2 wire dc distributor 600 m long as loaded as under:  
Distance from A in meters: 150 300 350 450  
Loads in amperes: 100 200 250 300  
The feeding point A is maintained at 440 V and that of B at 430 V. If each conductor has a resistance of 0.01 ohm per 100 m.  
Calculate:
  - i) the current supplied from A to B
  - ii) the power dissipated in the distributor

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Set **Q**

**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) 310 km line is considered as \_\_\_\_\_  
 a) a long transmission line      b) a medium transmission line  
 c) a short transmission line      d) any of the above
- 2) In any transmission line  $AD - BC =$  \_\_\_\_\_?  
 a) 1      b) 0  
 c) 2      d) 3
- 3) The values of A, B, C and D constants for a short transmission line are respectively \_\_\_\_\_  
 a) Z, 0, 1 and 1      b) 0, 1, 1 and Z  
 c) 1, Z, 0 and 1      d) 1, 1, Z and 0
- 4) Feeder is designed mainly from the point of view of \_\_\_\_\_  
 a) Its current carrying capacity      b) Voltage drop in it  
 c) Operating voltage      d) Operating Frequency
- 5) A \_\_\_\_\_ distribution system is more reliable than the \_\_\_\_\_ distribution System.  
 a) parallel, ring      b) radial, parallel  
 c) parallel, radial      d) ring, parallel
- 6) In a substation the following equipment is not installed \_\_\_\_\_  
 a) Exciters      b) Series capacitors  
 c) Shunt reactors      d) Voltage transformers
- 7) Which of the following are the methods of grounding?  
 a) Resistance      b) Reactance  
 c) Solid      d) All of these
- 8) The corona is considerably affected by which of the following \_\_\_\_\_  
 a) Size of the conductor  
 b) Shape of the conductor  
 c) Surface condition of the conductor  
 d) All of the above



- 9) Corona usually occurs when the electrostatic stress in the air around the conductor succeeds \_\_\_\_\_.  
a) 30 kV (maximum value)/cm      b) 22 kV (maximum value)/cm  
c) 11 kV (rms value)/cm      d) 6.6 kV (rms value)/cm
- 10) A conductor, due to sag between two supports, takes the form of \_\_\_\_\_.  
a) semi-circle      b) catenary  
c) triangle      d) ellipse
- 11) In a cable immediately above metallic sheath \_\_\_\_\_ is provided.  
a) Earthing connection      b) Bedding  
c) Armouring      d) None of the above
- 12) The process of achieving uniformity in the dielectric stress by using layers of different dielectrics is known as \_\_\_\_\_.  
a) Stranding process      b) Grading of cables  
c) Stress distribution      d) Capacitance grading
- 13) The thickness of the layer of insulation on the conductor, in cables, depends upon \_\_\_\_\_.  
a) Reactive power      b) Power factor  
c) Voltage      d) Current carrying capacity
- 14) The conductor carries more current on the surface in comparison to its core. This phenomenon is called the \_\_\_\_\_.  
a) Corona      b) Ferranti effect  
c) Lenz's effect      d) Skin effect

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Set **Q**

**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Solve Any Four.****16**

- What is corona? Explain the factors affecting corona.
- A single core cable has a conductor diameter of 2.5 cm & insulation of thickness of 1.2 cm. If the specific resistance of insulation is  $4.5 \times 10^{14} \Omega$  cm, calculate the insulation resistance per kilometer length of cable.
- Explain the concept of GMR & GMD.
- A 132 KV transmission line has the following details:  
 weight of conductor = 680 kg/km, length of span = 260 m,  
 ultimate strength = 3100 kg, safety factor = 2.  
 Calculate the height above the ground at which the conductor should be supported. Ground clearance required is 10 m.
- Explain in detail skin effect & proximity effect.
- Write short note on dielectric stress in single core cable.

**Q.3 Attempt any Two.****12**

- The tower of height 30 m and 90 m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500 m. If the tension in the conductor is 1600 kg, find the minimum clearance of the conductor and water and clearance midway between the supports. Weight of conductor is 1.5 kg/m. Bases of the towers can be considered to be at water level.
- Derive the expression for inductance of 3-ph single circuit overhead triangular configuration of transmission line for equilateral spacing.
- Explain the following methods of cable grading:  
 i) Capacitance grading ii) Intersheath grading

**Section – II****Q.4 Attempt any Four.****16**

- Derive an expression for voltage regulation and efficiency of short transmission line along with the equivalent circuit and phasor diagram.
- Explain different equipment used in substation.
- Write short note on connection schemes of distribution systems.
- A 3-phase, 50 Hz, overhead transmission line delivers 10 MW at 0.8 p.f lagging and at 66 KV. The resistance & inductive reactance of line per phase are  $10\Omega$  &  $20\Omega$  respectively while capacitive admittance is  $4 \times 10^{-4}$  siemen. Calculate sending voltage (line-to-line) & sending end power factor using nominal T Method.

- e) Draw and explain concentrated loaded DC distributor fed at one end.
- f) Write short note on reactance grounding.

**Q.5 Attempt any two.****12**

- a) A single-phase overhead transmission line delivers 1000 kW at 10 KV at 0.85 p.f. lagg. The total resistance and inductive reactance of the line are  $2\ \Omega$  and  $3\ \Omega$  respectively.  
Determine:
  - 1) Sending end voltage
  - 2) Voltage regulation
  - 3) Transmission Efficiency
- b) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal  $\pi$  method.
- c) A 2 wire dc distributor 600 m long as loaded as under:  
 Distance from A in meters: 150   300   350   450  
 Loads in amperes:            100   200   250   300  
 The feeding point A is maintained at 440 V and that of B at 430 V. If each conductor has a resistance of 0.01 ohm per 100 m.  
 Calculate:
  - i) the current supplied from A to B
  - ii) the power dissipated in the distributor

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Feeder is designed mainly from the point of view of \_\_\_\_\_.  
 a) Its current carrying capacity      b) Voltage drop in it  
 c) Operating voltage      d) Operating Frequency
- 2) A \_\_\_\_\_ distribution system is more reliable than the \_\_\_\_\_ distribution System.  
 a) parallel, ring      b) radial, parallel  
 c) parallel, radial      d) ring, parallel
- 3) In a substation the following equipment is not installed \_\_\_\_\_.  
 a) Exciters      b) Series capacitors  
 c) Shunt reactors      d) Voltage transformers
- 4) Which of the following are the methods of grounding?  
 a) Resistance      b) Reactance  
 c) Solid      d) All of these
- 5) The corona is considerably affected by which of the following \_\_\_\_\_.  
 a) Size of the conductor  
 b) Shape of the conductor  
 c) Surface condition of the conductor  
 d) All of the above
- 6) Corona usually occurs when the electrostatic stress in the air around the conductor succeeds \_\_\_\_\_.  
 a) 30 kV (maximum value)/cm      b) 22 kV (maximum value)/cm  
 c) 11 kV (rms value)/cm      d) 6.6 kV (rms value)/cm
- 7) A conductor, due to sag between two supports, takes the form of \_\_\_\_\_.  
 a) semi-circle      b) catenary  
 c) triangle      d) ellipse
- 8) In a cable immediately above metallic sheath \_\_\_\_\_ is provided.  
 a) Earthing connection      b) Bedding  
 c) Armouring      d) None of the above

- 9) The process of achieving uniformity in the dielectric stress by using layers of different dielectrics is known as \_\_\_\_\_.  
a) Stranding process                      b) Grading of cables  
c) Stress distribution                      d) Capacitance grading
- 10) The thickness of the layer of insulation on the conductor, in cables, depends upon \_\_\_\_\_.  
a) Reactive power                      b) Power factor  
c) Voltage                      d) Current carrying capacity
- 11) The conductor carries more current on the surface in comparison to its core. This phenomenon is called the \_\_\_\_\_.  
a) Corona                      b) Ferranti effect  
c) Lenz's effect                      d) Skin effect
- 12) 310 km line is considered as \_\_\_\_\_.  
a) a long transmission line                      b) a medium transmission line  
c) a short transmission line                      d) any of the above
- 13) In any transmission line  $AD - BC =$  \_\_\_\_\_?  
a) 1                      b) 0  
c) 2                      d) 3
- 14) The values of A, B, C and D constants for a short transmission line are respectively \_\_\_\_\_.  
a) Z, 0, 1 and 1                      b) 0,1,1 and Z  
c) 1, Z, 0 and 1                      d) 1,1, Z and O

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Set **R**

**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Solve Any Four.****16**

- What is corona? Explain the factors affecting corona.
- A single core cable has a conductor diameter of 2.5 cm & insulation of thickness of 1.2 cm. If the specific resistance of insulation is  $4.5 \times 10^{14} \Omega$  cm, calculate the insulation resistance per kilometer length of cable.
- Explain the concept of GMR & GMD.
- A 132 KV transmission line has the following details:  
 weight of conductor = 680 kg/km, length of span = 260 m,  
 ultimate strength = 3100 kg, safety factor = 2.  
 Calculate the height above the ground at which the conductor should be supported. Ground clearance required is 10 m.
- Explain in detail skin effect & proximity effect.
- Write short note on dielectric stress in single core cable.

**Q.3 Attempt any Two.****12**

- The tower of height 30 m and 90 m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500 m. If the tension in the conductor is 1600 kg, find the minimum clearance of the conductor and water and clearance midway between the supports. Weight of conductor is 1.5 kg/m. Bases of the towers can be considered to be at water level.
- Derive the expression for inductance of 3-ph single circuit overhead triangular configuration of transmission line for equilateral spacing.
- Explain the following methods of cable grading:  
 i) Capacitance grading ii) Intersheath grading

**Section – II****Q.4 Attempt any Four.****16**

- Derive an expression for voltage regulation and efficiency of short transmission line along with the equivalent circuit and phasor diagram.
- Explain different equipment used in substation.
- Write short note on connection schemes of distribution systems.
- A 3-phase, 50 Hz, overhead transmission line delivers 10 MW at 0.8 p.f lagging and at 66 KV. The resistance & inductive reactance of line per phase are  $10\Omega$  &  $20\Omega$  respectively while capacitive admittance is  $4 \times 10^{-4}$  siemen. Calculate sending voltage (line-to-line) & sending end power factor using nominal T Method.

- e) Draw and explain concentrated loaded DC distributor fed at one end.
- f) Write short note on reactance grounding.

**Q.5 Attempt any two.****12**

- a) A single-phase overhead transmission line delivers 1000 kW at 10 KV at 0.85 p.f. lagg. The total resistance and inductive reactance of the line are  $2\ \Omega$  and  $3\ \Omega$  respectively.  
Determine:
  - 1) Sending end voltage
  - 2) Voltage regulation
  - 3) Transmission Efficiency
- b) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal  $\pi$  method.
- c) A 2 wire dc distributor 600 m long as loaded as under:  
 Distance from A in meters: 150   300   350   450  
 Loads in amperes:            100   200   250   300  
 The feeding point A is maintained at 440 V and that of B at 430 V. If each conductor has a resistance of 0.01 ohm per 100 m.  
 Calculate:
  - i) the current supplied from A to B
  - ii) the power dissipated in the distributor

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Day & Date: Wednesday, 08-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicate full marks.

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) The thickness of the layer of insulation on the conductor, in cables, depends upon \_\_\_\_\_

|                   |                              |
|-------------------|------------------------------|
| a) Reactive power | b) Power factor              |
| c) Voltage        | d) Current carrying capacity |
- 2) The conductor carries more current on the surface in comparison to its core. This phenomenon is called the \_\_\_\_\_

|                  |                    |
|------------------|--------------------|
| a) Corona        | b) Ferranti effect |
| c) Lenz's effect | d) Skin effect     |
- 3) 310 km line is considered as \_\_\_\_\_

|                              |                               |
|------------------------------|-------------------------------|
| a) a long transmission line  | b) a medium transmission line |
| c) a short transmission line | d) any of the above           |
- 4) In any transmission line  $AD - BC = \underline{\hspace{2cm}}$ ?

|      |      |
|------|------|
| a) 1 | b) 0 |
| c) 2 | d) 3 |
- 5) The values of A, B, C and D constants for a short transmission line are respectively \_\_\_\_\_

|                  |                  |
|------------------|------------------|
| a) Z, 0, 1 and 1 | b) 0, 1, 1 and Z |
| c) 1, Z, 0 and 1 | d) 1, 1, Z and O |
- 6) Feeder is designed mainly from the point of view of \_\_\_\_\_

|                                  |                        |
|----------------------------------|------------------------|
| a) Its current carrying capacity | b) Voltage drop in it  |
| c) Operating voltage             | d) Operating Frequency |
- 7) A \_\_\_\_\_ distribution system is more reliable than the \_\_\_\_\_ distribution System.

|                     |                     |
|---------------------|---------------------|
| a) parallel, ring   | b) radial, parallel |
| c) parallel, radial | d) ring, parallel   |
- 8) In a substation the following equipment is not installed \_\_\_\_\_

|                   |                         |
|-------------------|-------------------------|
| a) Exciters       | b) Series capacitors    |
| c) Shunt reactors | d) Voltage transformers |





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Set **S**

**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Power System II**

Day & Date: Wednesday, 08-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I****Q.2 Solve Any Four. 16**

- What is corona? Explain the factors affecting corona.
- A single core cable has a conductor diameter of 2.5 cm & insulation of thickness of 1.2 cm. If the specific resistance of insulation is  $4.5 \times 10^{14} \Omega$  cm, calculate the insulation resistance per kilometer length of cable.
- Explain the concept of GMR & GMD.
- A 132 KV transmission line has the following details:  
 weight of conductor = 680 kg/km, length of span = 260 m,  
 ultimate strength = 3100 kg, safety factor = 2.  
 Calculate the height above the ground at which the conductor should be supported. Ground clearance required is 10 m.
- Explain in detail skin effect & proximity effect.
- Write short note on dielectric stress in single core cable.

**Q.3 Attempt any Two. 12**

- The tower of height 30 m and 90 m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500 m. If the tension in the conductor is 1600 kg, find the minimum clearance of the conductor and water and clearance midway between the supports. Weight of conductor is 1.5 kg/m. Bases of the towers can be considered to be at water level.
- Derive the expression for inductance of 3-ph single circuit overhead triangular configuration of transmission line for equilateral spacing.
- Explain the following methods of cable grading:  
 i) Capacitance grading ii) Intersheath grading

**Section – II****Q.4 Attempt any Four. 16**

- Derive an expression for voltage regulation and efficiency of short transmission line along with the equivalent circuit and phasor diagram.
- Explain different equipment used in substation.
- Write short note on connection schemes of distribution systems.
- A 3-phase, 50 Hz, overhead transmission line delivers 10 MW at 0.8 p.f lagging and at 66 KV. The resistance & inductive reactance of line per phase are  $10\Omega$  &  $20\Omega$  respectively while capacitive admittance is  $4 \times 10^{-4}$  siemen. Calculate sending voltage (line-to-line) & sending end power factor using nominal T Method.

- e) Draw and explain concentrated loaded DC distributor fed at one end.
- f) Write short note on reactance grounding.

**Q.5 Attempt any two.****12**

- a) A single-phase overhead transmission line delivers 1000 kW at 10 KV at 0.85 p.f. lagg. The total resistance and inductive reactance of the line are  $2\ \Omega$  and  $3\ \Omega$  respectively.  
Determine:
  - 1) Sending end voltage
  - 2) Voltage regulation
  - 3) Transmission Efficiency
- b) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal  $\pi$  method.
- c) A 2 wire dc distributor 600 m long as loaded as under:  
Distance from A in meters: 150 300 350 450  
Loads in amperes: 100 200 250 300  
The feeding point A is maintained at 440 V and that of B at 430 V. If each conductor has a resistance of 0.01 ohm per 100 m.  
Calculate:
  - i) the current supplied from A to B
  - ii) the power dissipated in the distributor

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Analog & Digital Integrated Circuits**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In the common mode \_\_\_\_\_.
  - a) both inputs are grounded
  - b) the outputs are connected together
  - c) an identical signal appears on both the inputs
  - d) the output signal are in-phase
- 2) The other name for Miller Circuit is \_\_\_\_\_.
  - a) Non-Inverting Integrator
  - b) Inverting Integrator
  - c) Non-Inverting Differentiator
  - d) Inverting Differentiator
- 3) The use of negative feedback \_\_\_\_\_.
  - a) reduces the voltage gain of an Op-amp
  - b) makes the Op-amp gain increase
  - c) makes no change
  - d) none of the above
- 4) The Op-amp can amplify
  - a) a.c. signals only
  - b) d.c. signals only
  - c) both a.c. and d.c. signals
  - d) Neither d.c. nor a.c. signals
- 5) A common-mode signal is applied to \_\_\_\_\_.
  - a) the non-inverting input
  - b) the inverting input
  - c) both inputs
  - d) top of the tail resistor
- 6) What happen if any positive input signal is applied to open-loop configuration?
  - a) Output reaches saturation level
  - b) Output voltage swing's peak to peak
  - c) Output will be a sine waveform
  - d) Output will be a non-sinusoidal waveform
- 7) In which amplifier the output voltage is equal to the negative sum of all the inputs?
  - a) Averaging amplifier
  - b) inverting Summing amplifier
  - c) Scaling amplifier
  - d) All of the mentioned

- 8) Differentiation amplifier produces
- a) Output waveform as integration of input waveform
  - b) Input waveform as integration of output waveform
  - c) Output waveform as derivative of input waveform
  - d) Input waveform as derivative of output waveform
- 9) Which of the following method is used to minimize Boolean expressions
- a) Fourier transform
  - b) Gray code
  - c) Karnaugh mapping
  - d) Venitch method
- 10) The Boolean expression  $Y = XY + ZX$  is in the \_\_\_\_\_ form.
- a) Product-of-Sum
  - b) Sum-of-Products
  - c) Linear
  - d) None of the above
- 11) How many types of latches are there?
- a) One
  - b) Two
  - c) Six
  - d) Four
- 12) Which circuit doesn't have a memory unit?
- a) Combinational
  - b) Sequential
  - c) Both a and b
  - d) None of the above
- 13) A register is defined as \_\_\_\_\_.
- a) The group of latches for storing many bit of information
  - b) The group of latches for storing n-bit of information
  - c) The group of flip-flops suitable for storing one byte of information
  - d) The group of flip-flops suitable for storing binary information
- 14) In D register, 'D' stands for \_\_\_\_\_.
- a) Delay
  - b) Decrement
  - c) Data
  - d) Decay

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated Circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I**

**Q.2 Answer the following (Any four) 16**

- With neat circuit diagram explain working of subtractor.
- Explain the effect of power supply on offset voltage.
- List practical characteristics of Op-AMP. Explain shortly.
- Design a circuit for  $V_0 = - (V_1 + V_2 + V_3)$
- Draw and Explain working of practical differentiator.

**Q.3 Answer the Following (Any two) 12**

- Draw and Explain Instrumentation amplifier.
- Explain working of Practical Integrator with frequency response.
- Draw and explain block diagram of Operational amplifier.

**Section – II**

**Q.4 Answer the following (Any four) 16**

- Explain different modes of shift registers with suitable diagrams.
- Differentiate between synchronous and asynchronous counters.
- Define the following term with logic families.
  - Propagation delay
  - Power Dissipation
  - Fan out
  - Noise Margin
- Explain full adder in details & realize it using basic logic gates.
- Explain 4 bit ring counter.

**Q.5 Answer the Following (Any Two) 12**

- Design 2 bit synchronous counter using T flip flop.
- Reduce the following expression using K-map and implement reduced expression by using Logic gates.  
 $F = (A, B, C, D) = \sum(1, 2, 5, 8, 11, 13)$
- Design a mod-10 asynchronous down counter using J-K flip flop.

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated Circuits**

Day & Date: Thursday, 09-03-2023  
Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
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3) Figures to the right indicates full marks.  
4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Differentiation amplifier produces
  - a) Output waveform as integration of input waveform
  - b) Input waveform as integration of output waveform
  - c) Output waveform as derivative of input waveform
  - d) Input waveform as derivative of output waveform
- 2) Which of the following method is used to minimize Boolean expressions
  - a) Fourier transform
  - b) Gray code
  - c) Karnaugh mapping
  - d) Venitch method
- 3) The Boolean expression  $Y = XY + ZX$  is in the \_\_\_\_\_ form.
  - a) Product-of-Sum
  - b) Sum-of-Products
  - c) Linear
  - d) None of the above
- 4) How many types of latches are there?
  - a) One
  - b) Two
  - c) Six
  - d) Four
- 5) Which circuit doesn't have a memory unit?
  - a) Combinational
  - b) Sequential
  - c) Both a and b
  - d) None of the above
- 6) A register is defined as \_\_\_\_\_.
  - a) The group of latches for storing many bit of information
  - b) The group of latches for storing n-bit of information
  - c) The group of flip-flops suitable for storing one byte of information
  - d) The group of flip-flops suitable for storing binary information
- 7) In D register, 'D' stands for \_\_\_\_\_.
  - a) Delay
  - b) Decrement
  - c) Data
  - d) Decay

- 8) In the common mode \_\_\_\_\_.  
a) both inputs are grounded  
b) the outputs are connected together  
c) an identical signal appears on both the inputs  
d) the output signal are in-phase
- 9) The other name for Miller Circuit is \_\_\_\_\_.  
a) Non-Inverting Integrator      b) Inverting Integrator  
c) Non-Inverting Differentiator      d) Inverting Differentiator
- 10) The use of negative feedback \_\_\_\_\_.  
a) reduces the voltage gain of an Op-amp  
b) makes the Op-amp gain increase  
c) makes no change  
d) none of the above
- 11) The Op-amp can amplify  
a) a.c. signals only      b) d.c. signals only  
c) both a.c. and d.c. signals      d) Neither d.c. nor a.c. signals
- 12) A common-mode signal is applied to \_\_\_\_\_.  
a) the non-inverting input      b) the inverting input  
c) both inputs      d) top of the tail resistor
- 13) What happen if any positive input signal is applied to open-loop configuration?  
a) Output reaches saturation level  
b) Output voltage swing's peak to peak  
c) Output will be a sine waveform  
d) Output will be a non-sinusoidal waveform
- 14) In which amplifier the output voltage is equal to the negative sum of all the inputs?  
a) Averaging amplifier      b) inverting Summing amplifier  
c) Scaling amplifier      d) All of the mentioned



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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated Circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I**

**Q.2 Answer the following (Any four) 16**

- With neat circuit diagram explain working of subtractor.
- Explain the effect of power supply on offset voltage.
- List practical characteristics of Op-AMP. Explain shortly.
- Design a circuit for  $V_0 = - (V_1 + V_2 + V_3)$
- Draw and Explain working of practical differentiator.

**Q.3 Answer the Following (Any two) 12**

- Draw and Explain Instrumentation amplifier.
- Explain working of Practical Integrator with frequency response.
- Draw and explain block diagram of Operational amplifier.

**Section – II**

**Q.4 Answer the following (Any four) 16**

- Explain different modes of shift registers with suitable diagrams.
- Differentiate between synchronous and asynchronous counters.
- Define the following term with logic families.
  - Propagation delay
  - Power Dissipation
  - Fan out
  - Noise Margin
- Explain full adder in details & realize it using basic logic gates.
- Explain 4 bit ring counter.

**Q.5 Answer the Following (Any Two) 12**

- Design 2 bit synchronous counter using T flip flop.
- Reduce the following expression using K-map and implement reduced expression by using Logic gates.  
 $F = (A, B, C, D) = \sum(1, 2, 5, 8, 11, 13)$
- Design a mod-10 asynchronous down counter using J-K flip flop.

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated Circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks.  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) How many types of latches are there?
 

|        |         |
|--------|---------|
| a) One | b) Two  |
| c) Six | d) Four |
- 2) Which circuit doesn't have a memory unit?
 

|                  |                      |
|------------------|----------------------|
| a) Combinational | b) Sequential        |
| c) Both a and b  | d) None of the above |
- 3) A register is defined as \_\_\_\_\_.
 

|                                                                         |
|-------------------------------------------------------------------------|
| a) The group of latches for storing many bit of information             |
| b) The group of latches for storing n-bit of information                |
| c) The group of flip-flops suitable for storing one byte of information |
| d) The group of flip-flops suitable for storing binary information      |
- 4) In D register, 'D' stands for \_\_\_\_\_.
 

|          |              |
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| a) Delay | b) Decrement |
| c) Data  | d) Decay     |
- 5) In the common mode \_\_\_\_\_.
 

|                                                   |
|---------------------------------------------------|
| a) both inputs are grounded                       |
| b) the outputs are connected together             |
| c) an identical signal appears on both the inputs |
| d) the output signal are in-phase                 |
- 6) The other name for Miller Circuit is \_\_\_\_\_.
 

|                                 |                             |
|---------------------------------|-----------------------------|
| a) Non-Inverting Integrator     | b) Inverting Integrator     |
| c) Non-Inverting Differentiator | d) Inverting Differentiator |
- 7) The use of negative feedback \_\_\_\_\_.
 

|                                          |
|------------------------------------------|
| a) reduces the voltage gain of an Op-amp |
| b) makes the Op-amp gain increase        |
| c) makes no change                       |
| d) none of the above                     |

- 8) The Op-amp can amplify  
a) a.c. signals only                      b) d.c. signals only  
c) both a.c. and d.c. signals          d) Neither d.c. nor a.c. signals
- 9) A common-mode signal is applied to \_\_\_\_\_.  
a) the non-inverting input              b) the inverting input  
c) both inputs                              d) top of the tail resistor
- 10) What happen if any positive input signal is applied to open-loop configuration?  
a) Output reaches saturation level  
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c) Output will be a sine waveform  
d) Output will be a non-sinusoidal waveform
- 11) In which amplifier the output voltage is equal to the negative sum of all the inputs?  
a) Averaging amplifier                      b) inverting Summing amplifier  
c) Scaling amplifier                        d) All of the mentioned
- 12) Differentiation amplifier produces  
a) Output waveform as integration of input waveform  
b) Input waveform as integration of output waveform  
c) Output waveform as derivative of input waveform  
d) Input waveform as derivative of output waveform
- 13) Which of the following method is used to minimize Boolean expressions  
a) Fourier transform                      b) Gray code  
c) Karnaugh mapping                      d) Venitch method
- 14) The Boolean expression  $Y = XY + ZX$  is in the \_\_\_\_\_ form.  
a) Product-of-Sum                        b) Sum-of-Products  
c) Linear                                      d) None of the above

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated Circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All question are compulsory.  
 2) Section I and Section II are compulsory.

**Section – I**

**Q.2 Answer the following (Any four) 16**

- With neat circuit diagram explain working of subtractor.
- Explain the effect of power supply on offset voltage.
- List practical characteristics of Op-AMP. Explain shortly.
- Design a circuit for  $V_0 = - (V_1 + V_2 + V_3)$
- Draw and Explain working of practical differentiator.

**Q.3 Answer the Following (Any two) 12**

- Draw and Explain Instrumentation amplifier.
- Explain working of Practical Integrator with frequency response.
- Draw and explain block diagram of Operational amplifier.

**Section – II**

**Q.4 Answer the following (Any four) 16**

- Explain different modes of shift registers with suitable diagrams.
- Differentiate between synchronous and asynchronous counters.
- Define the following term with logic families.
  - Propagation delay
  - Power Dissipation
  - Fan out
  - Noise Margin
- Explain full adder in details & realize it using basic logic gates.
- Explain 4 bit ring counter.

**Q.5 Answer the Following (Any Two) 12**

- Design 2 bit synchronous counter using T flip flop.
- Reduce the following expression using K-map and implement reduced expression by using Logic gates.  
 $F = (A, B, C, D) = \sum(1, 2, 5, 8, 11, 13)$
- Design a mod-10 asynchronous down counter using J-K flip flop.

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Analog & Digital Integrated Circuits**

Day & Date: Thursday, 09-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) What happen if any positive input signal is applied to open-loop configuration?
  - a) Output reaches saturation level
  - b) Output voltage swing's peak to peak
  - c) Output will be a sine waveform
  - d) Output will be a non-sinusoidal waveform
- 2) In which amplifier the output voltage is equal to the negative sum of all the inputs?
  - a) Averaging amplifier
  - b) inverting Summing amplifier
  - c) Scaling amplifier
  - d) All of the mentioned
- 3) Differentiation amplifier produces
  - a) Output waveform as integration of input waveform
  - b) Input waveform as integration of output waveform
  - c) Output waveform as derivative of input waveform
  - d) Input waveform as derivative of output waveform
- 4) Which of the following method is used to minimize Boolean expressions
  - a) Fourier transform
  - b) Gray code
  - c) Karnaugh mapping
  - d) Venitch method
- 5) The Boolean expression  $Y = XY + ZX$  is in the \_\_\_\_\_ form.
  - a) Product-of-Sum
  - b) Sum-of-Products
  - c) Linear
  - d) None of the above
- 6) How many types of latches are there?
  - a) One
  - b) Two
  - c) Six
  - d) Four
- 7) Which circuit doesn't have a memory unit?
  - a) Combinational
  - b) Sequential
  - c) Both a and b
  - d) None of the above

- 8) A register is defined as \_\_\_\_\_.  
a) The group of latches for storing many bit of information  
b) The group of latches for storing n-bit of information  
c) The group of flip-flops suitable for storing one byte of information  
d) The group of flip-flops suitable for storing binary information
- 9) In D register, 'D' stands for \_\_\_\_\_.  
a) Delay  
b) Decrement  
c) Data  
d) Decay
- 10) In the common mode \_\_\_\_\_.  
a) both inputs are grounded  
b) the outputs are connected together  
c) an identical signal appears on both the inputs  
d) the output signal are in-phase
- 11) The other name for Miller Circuit is \_\_\_\_\_.  
a) Non-Inverting Integrator  
b) Inverting Integrator  
c) Non-Inverting Differentiator  
d) Inverting Differentiator
- 12) The use of negative feedback \_\_\_\_\_.  
a) reduces the voltage gain of an Op-amp  
b) makes the Op-amp gain increase  
c) makes no change  
d) none of the above
- 13) The Op-amp can amplify  
a) a.c. signals only  
b) d.c. signals only  
c) both a.c. and d.c. signals  
d) Neither d.c. nor a.c. signals
- 14) A common-mode signal is applied to \_\_\_\_\_.  
a) the non-inverting input  
b) the inverting input  
c) both inputs  
d) top of the tail resistor

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**S.Y (B. Tech) (Sem-II) (Old) (CBCS) Examination: Oct/Nov-2022**

**ELECTRICAL ENGINEERING**

**Analog & Digital Integrated Circuits**

Day & Date: Thursday, 09-03-2023

Max. Marks: 56

Time: 02:00 PM To 05:00 PM

**Instructions:** 1) All question are compulsory.  
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**Section – I**

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- Differentiate between synchronous and asynchronous counters.
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- Explain 4 bit ring counter.

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- Design 2 bit synchronous counter using T flip flop.
- Reduce the following expression using K-map and implement reduced expression by using Logic gates.  

$$F(A, B, C, D) = \sum(1, 2, 5, 8, 11, 13)$$
- Design a mod-10 asynchronous down counter using J-K flip flop.

**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Max. Marks: 70

**Instructions:**

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- 3) Figures to the right indicates full marks
- 4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

- Page 1 of 24



- 7) Superposition theorem is not applicable to network containing \_\_\_\_\_.  
a) nonlinear elements                      b) dependent voltage source  
c) dependent current source              d) transformers
- 8) An RC circuit has  $R = 2 \text{ ohm}$  and  $C = 4F$ . The time constant is \_\_\_\_\_.  
a) 0.5 s                                          b) 2 s  
c) 8 s                                              d) 1.5 s
- 9) Laplace transform of a unit ramp function is \_\_\_\_\_.  
a) 1                                                b) s  
c) 1/s                                              d) 1/s<sup>2</sup>
- 10)  $L[e^{iat}]$  is \_\_\_\_\_.  
a)  $1/(s + ia)$                                   b)  $1/s$   
c)  $1/(s - ia)$                                   d) none of these
- 11) A capacitor does not allow sudden changes in \_\_\_\_\_.  
a) currents                                        b) voltages  
c) both a and b                                  d) none of above
- 12) Transients are presents in the circuit when the circuit is having \_\_\_\_\_.  
a) R                                                b) L  
c) C                                                d) either b) or c)
- 13) A 2-port network using z-parameter representation is said to be reciprocal if \_\_\_\_\_.  
a)  $Z_{11} = Z_{22}$                                       b)  $Z_{12} = Z_{21}$   
c)  $Z_{12} = -Z_{21}$                                     d)  $Z_{11}Z_{22} - Z_{12}Z_{21} = 1$
- 14) Which parameters are widely used in transmission line theory?  
a) Z parameters                                  b) ABCD parameters  
c) Y parameters                                  d) h parameters

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

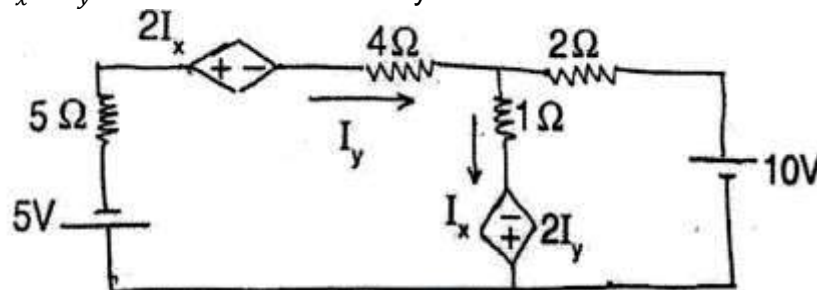
**Instructions:** 1) All questions are compulsory.  
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**Section – I**

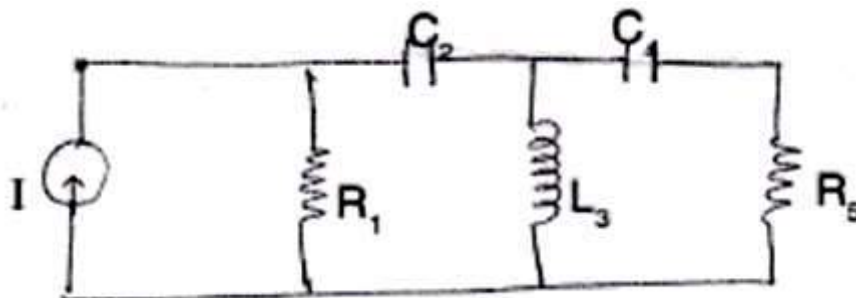
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**16**

a) Find the  $I_x$  &  $I_y$  for the circuit shown by mesh method.

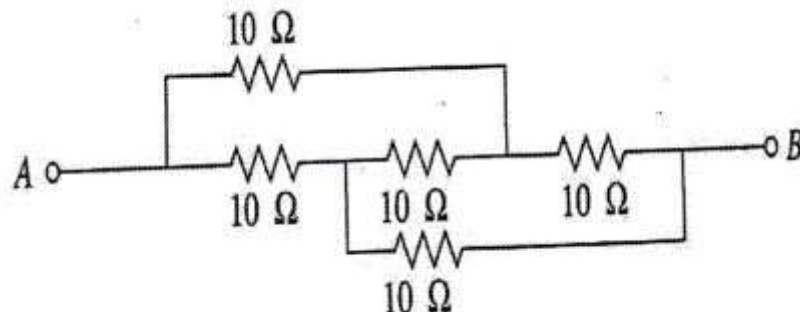


b) Draw the dual of the network.

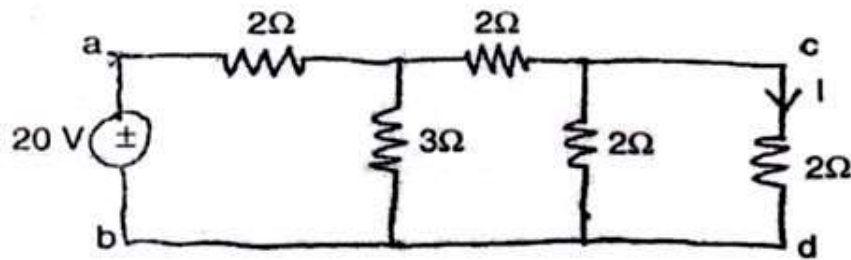


c) Derive the condition for maximum power transfer.

d) Find the Equivalent Resistance between terminal A & B.



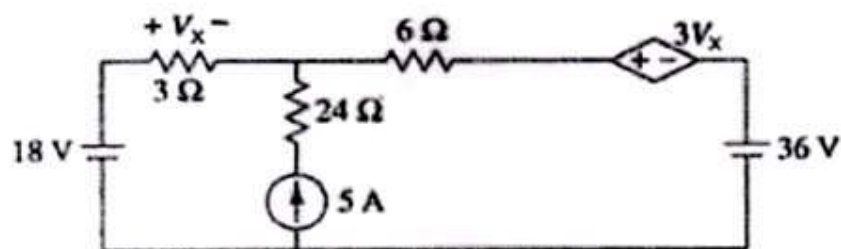
- e) Verify the Reciprocity theorem for the network shown below.



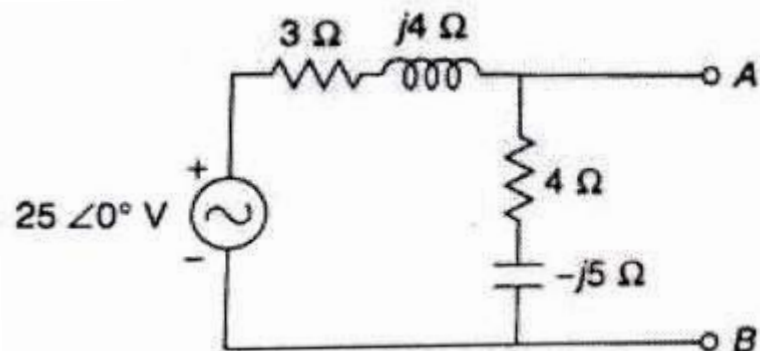
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12

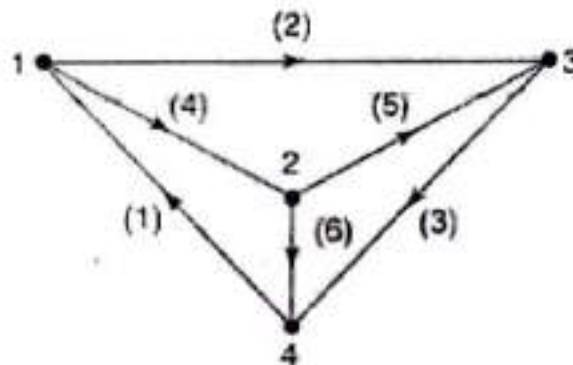
- a) Find the voltage  $V_x$  by Superposition principle.



- b) Find Norton's equivalent network for the circuit shown.



- c) The graph of a network shown in fig. write  
 1) Incidence matrix  
 2) Tie set matrix  
 3) Cut set matrix

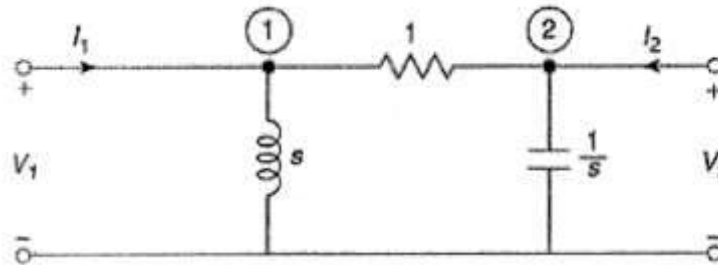
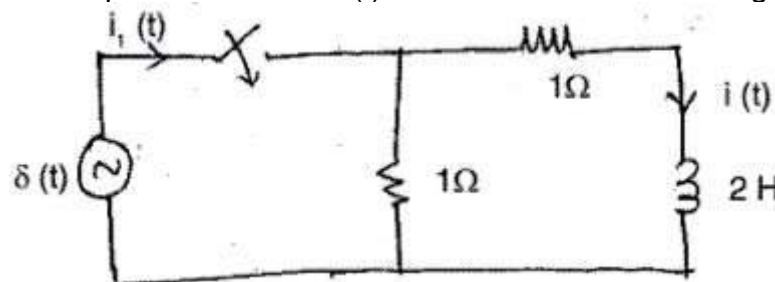
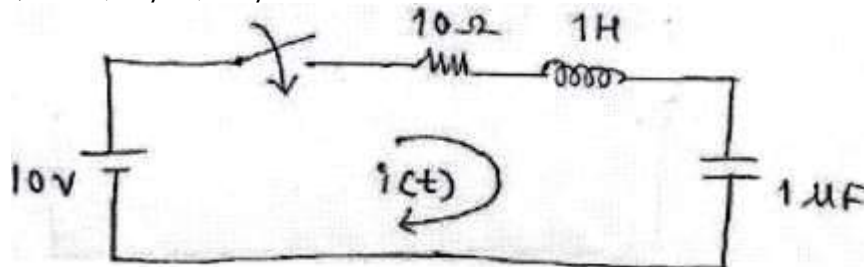


## Section – II

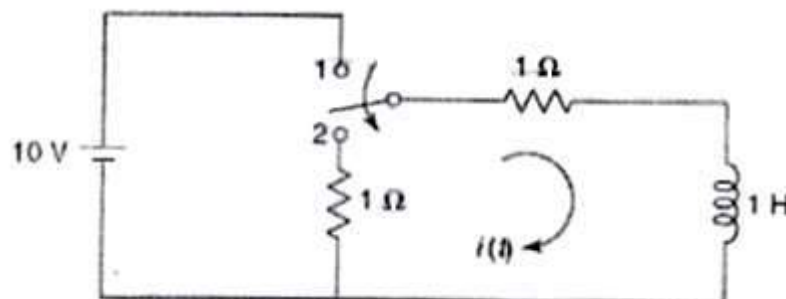
Q.4 Answer the following questions. (Any Four)

16

a) Determine transmission parameters for the given network.

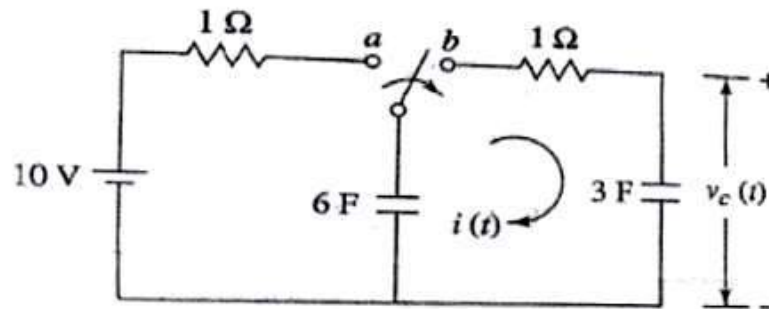
b) Find impulse response of current  $i(t)$  in the network shown in fig.c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find  $i$ ,  $di/dt$ ,  $d^2i/dt^2$  at  $t = 0 +$ .

d) Derive ABCD parameter in terms of Y-parameter.

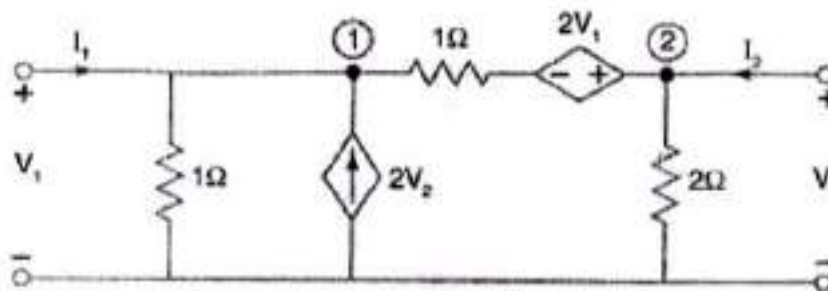
e) In the network shown in fig. the switch is moved from 1 to 2 at  $t = 0$ . Steady state condition having reached in position 1. Determine  $i(t)$  for  $t > 0$  using Laplace transforms.

**Q.5 Answer the following questions. (Any Two)**

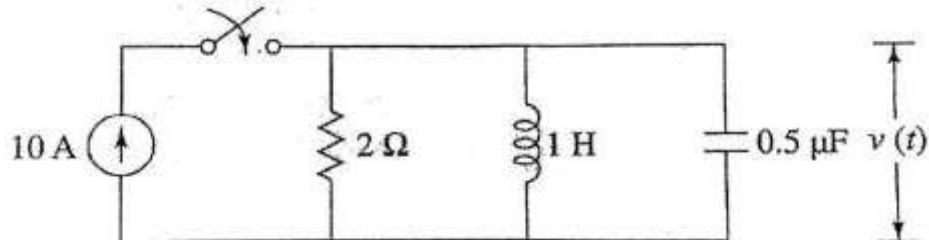
- a) In the network of fig. the switch is moved from a to b at  $t = 0$ . Determine  $i(t)$  and  $V_c(t)$  using Laplace transforms.



- b) Find Y and Z-Parameters of the network shown in Fig.



- c) For the Network shown in Fig. Switch is closed at  $t = 0$ , determine  $v$ ,  $dv/dt$  and  $d^2v/dt^2$  at  $t = 0 +$ .



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## Max. Marks: 70

Marks: 14

14

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- 9) The number of independent loops for a network with  $n$  nodes and  $b$  branches is \_\_\_\_\_.  
a)  $n - 1$   
b)  $b - n$   
c)  $b - n + 1$   
d) independent of the number of nodes
- 10) A practical current source consists of \_\_\_\_\_.  
a) An ideal current source in series with a resistance  
b) An ideal current source in parallel with a resistance  
c) Both are correct  
d) None of the above
- 11) In Norton's theorem, to find  $Z_N$  \_\_\_\_\_.  
a) All independent current sources are short circuited and independent voltage sources are open circuited  
b) All independent voltage and current sources are open circuited  
c) All independent voltage and current sources are short circuited  
d) All independent voltage sources are short circuited and independent current sources are open circuited
- 12) 3-ohm resistors are connected to form a triangle. What is the resistance between any two of the corners?  
a)  $\frac{3}{4}$  ohm  
b) 3 ohm  
c) 2 ohm  
d)  $\frac{4}{3}$  ohm
- 13) The nodal method of circuit analysis is based on \_\_\_\_\_.  
a) KVL and ohms law  
b) KCL and ohms law  
c) KVL and KCL  
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- 14) Superposition theorem is not applicable to network containing \_\_\_\_\_.  
a) nonlinear elements  
b) dependent voltage source  
c) dependent current source  
d) transformers

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

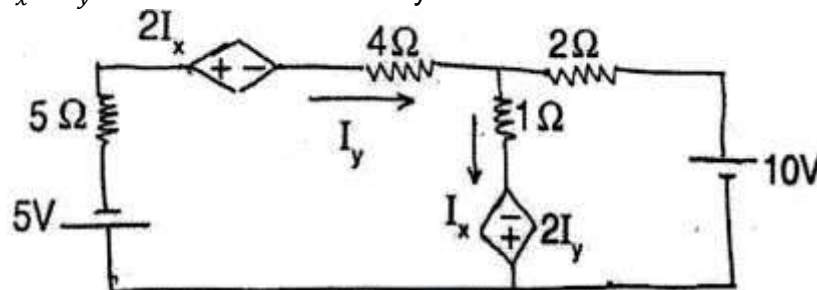
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**Section – I**

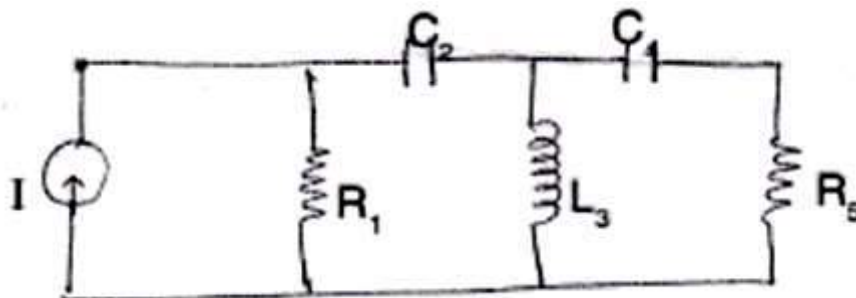
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a) Find the  $I_x$  &  $I_y$  for the circuit shown by mesh method.

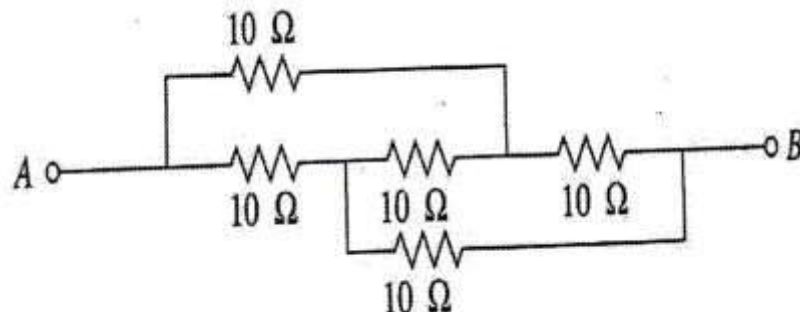


b) Draw the dual of the network.



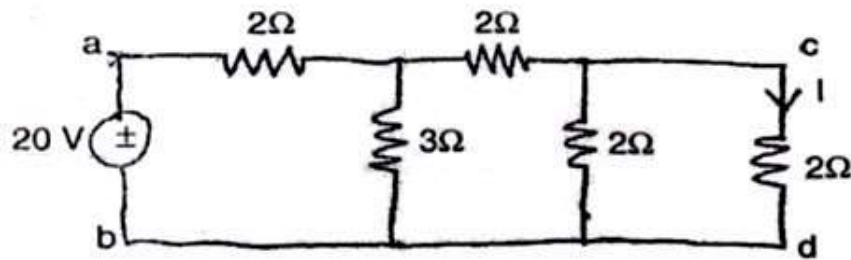
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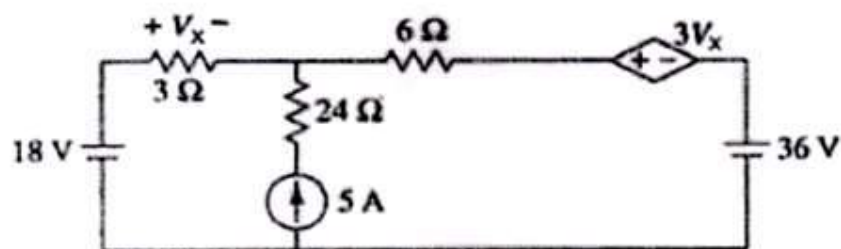
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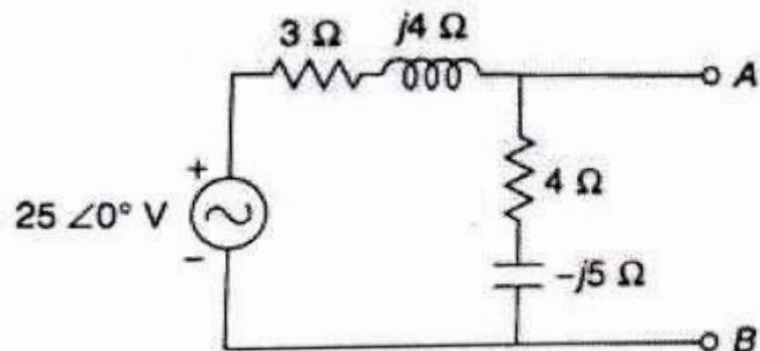
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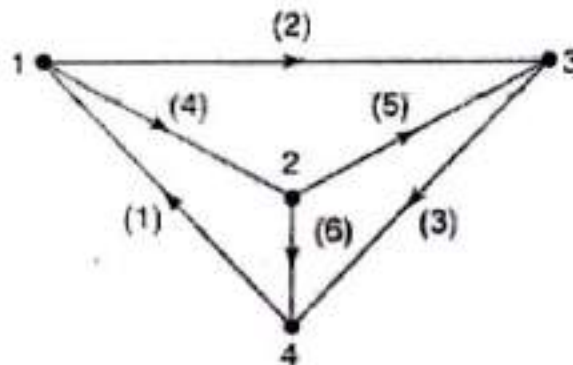
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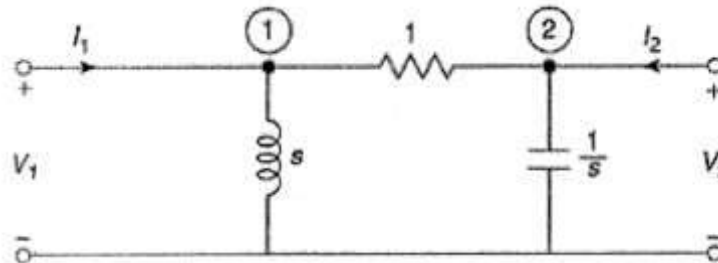
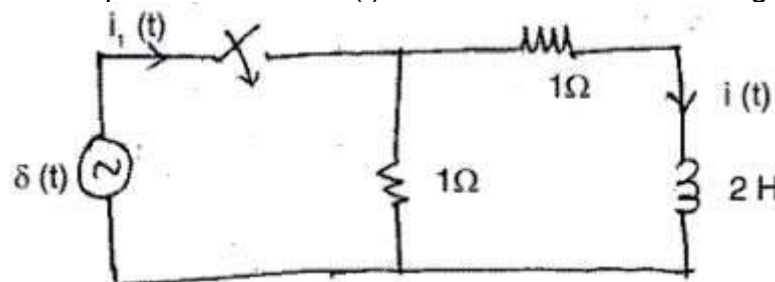
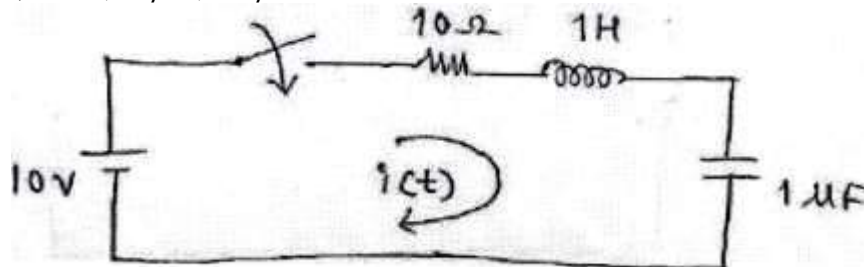


## Section – II

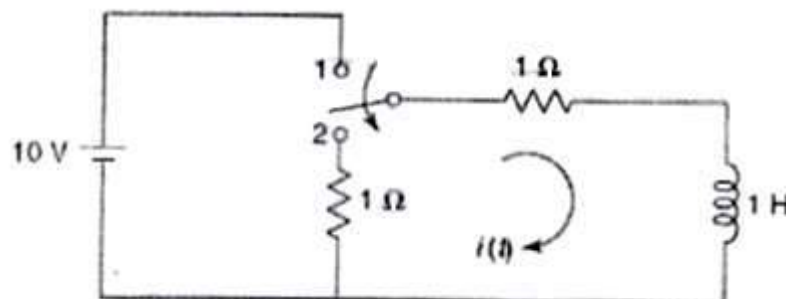
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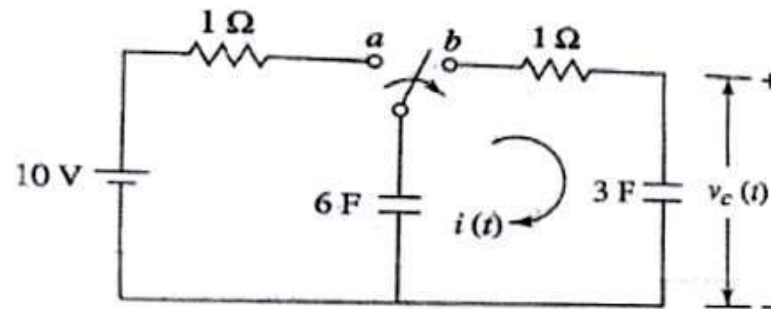
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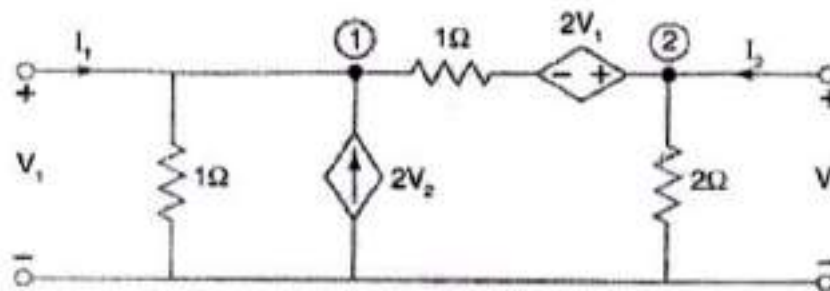
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**Q.5 Answer the following questions. (Any Two)**

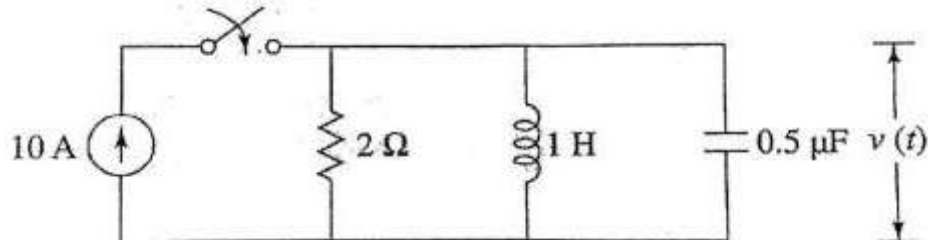
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## R

- 8) In Norton's theorem, to find  $Z_N$  \_\_\_\_\_.  
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 a) 0.5 s  
 b) 2 s  
 c) 8 s  
 d) 1.5 s
- 13) Laplace transform of a unit ramp function is \_\_\_\_\_.  
 a) 1  
 b) s  
 c) 1/s  
 d) 1/s<sup>2</sup>
- 14)  $L[e^{iat}]$  is \_\_\_\_\_.  
 a)  $1/(s + ia)$   
 b)  $1/s$   
 c)  $1/(s - ia)$   
 d) none of these

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

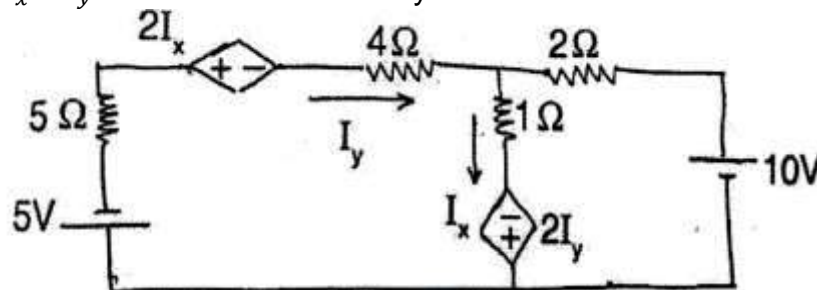
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**Section – I**

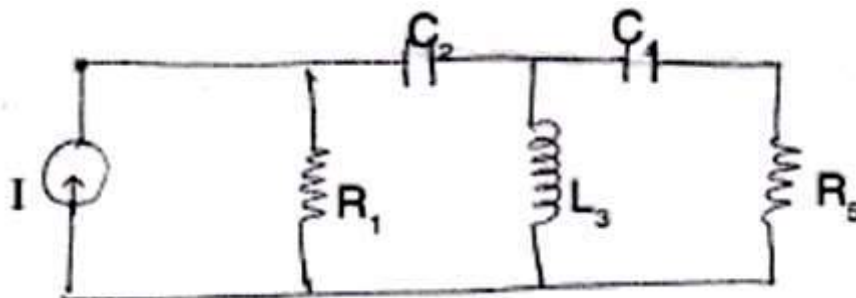
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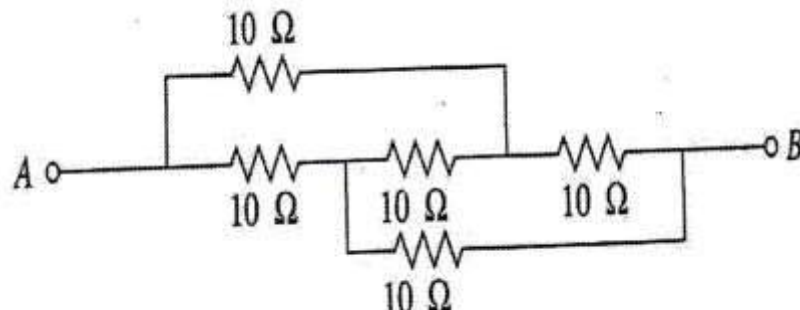


b) Draw the dual of the network.

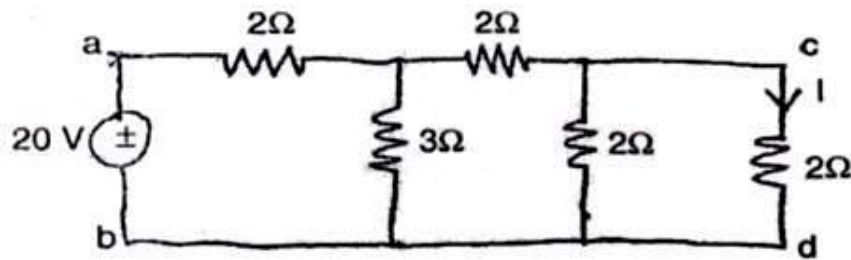


c) Derive the condition for maximum power transfer.

d) Find the Equivalent Resistance between terminal A & B.



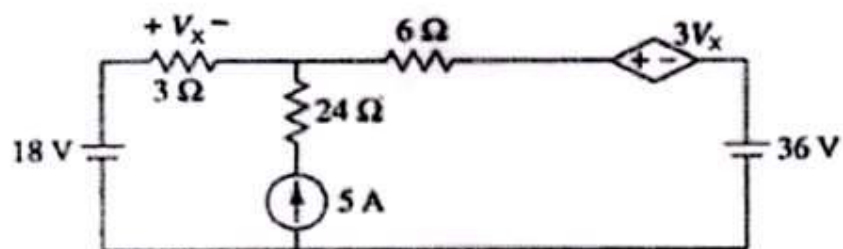
- e) Verify the Reciprocity theorem for the network shown below.



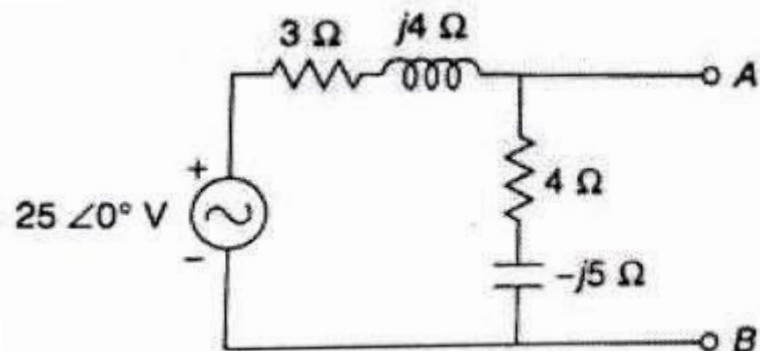
**Q.3 Answer the following questions. (Any Two)**

12

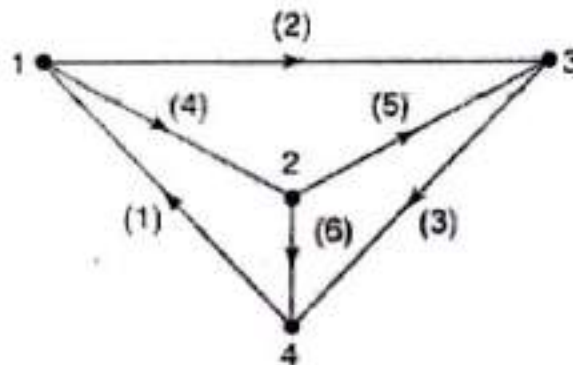
- a) Find the voltage  $V_x$  by Superposition principle.



- b) Find Norton's equivalent network for the circuit shown.



- c) The graph of a network shown in fig. write  
 1) Incidence matrix  
 2) Tie set matrix  
 3) Cut set matrix

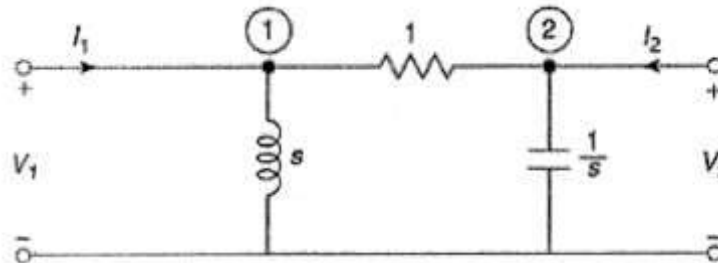
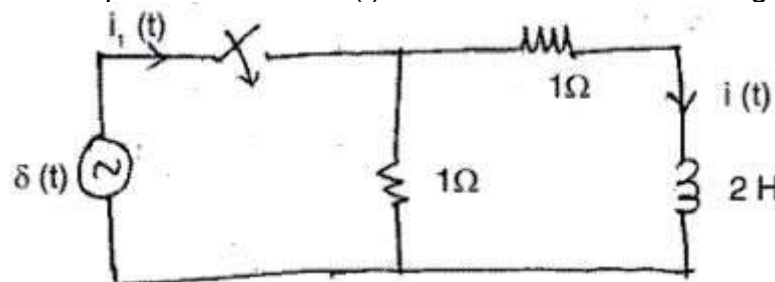
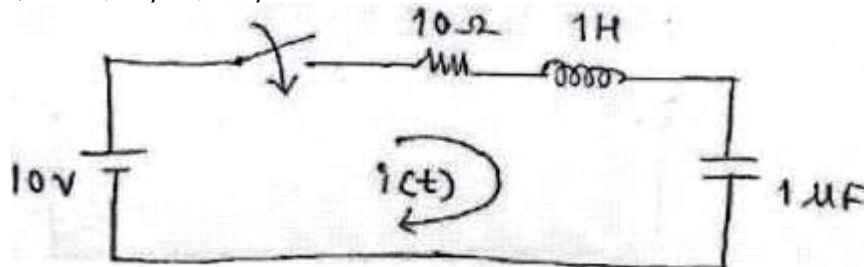


## Section – II

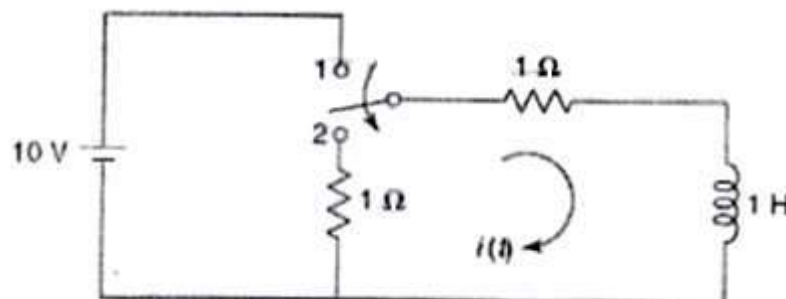
Q.4 Answer the following questions. (Any Four)

16

a) Determine transmission parameters for the given network.

b) Find impulse response of current  $i(t)$  in the network shown in fig.c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find  $i$ ,  $di/dt$ ,  $d^2i/dt^2$  at  $t = 0 +$ .

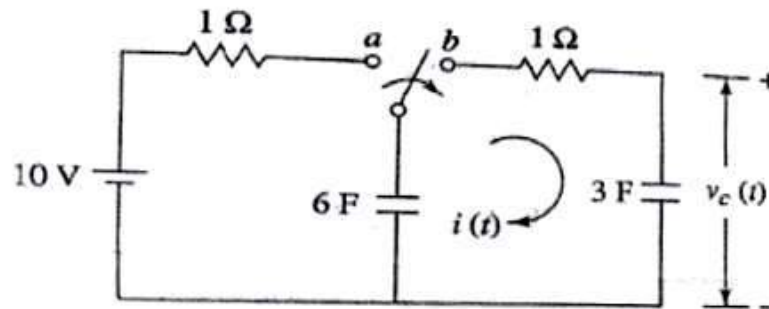
d) Derive ABCD parameter in terms of Y-parameter.

e) In the network shown in fig. the switch is moved from 1 to 2 at  $t = 0$ . Steady state condition having reached in position 1. Determine  $i(t)$  for  $t > 0$  using Laplace transforms.

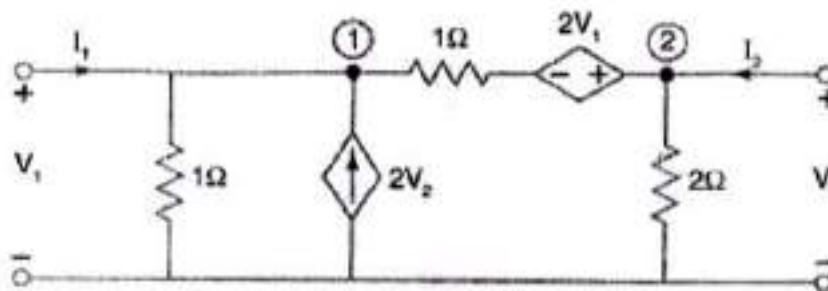


**Q.5 Answer the following questions. (Any Two)**

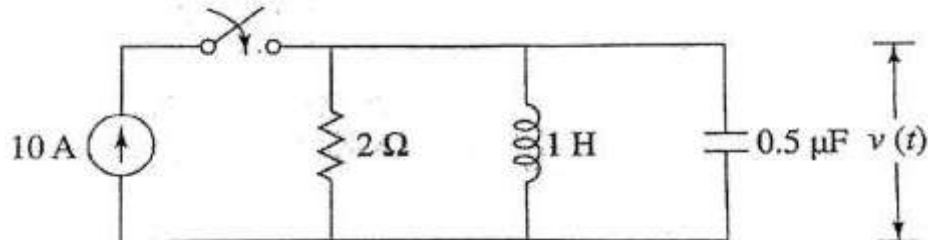
- a) In the network of fig. the switch is moved from a to b at  $t = 0$ . Determine  $i(t)$  and  $V_c(t)$  using Laplace transforms.



- b) Find Y and Z-Parameters of the network shown in Fig.



- c) For the Network shown in Fig. Switch is closed at  $t = 0$ , determine  $v$ ,  $dv/dt$  and  $d^2v/dt^2$  at  $t = 0 +$ .



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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicates full marks  
 4) Assume suitable data wherever needed and mention it clearly.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The nodal method of circuit analysis is based on \_\_\_\_\_.  
 a) KVL and ohms law                      b) KCL and ohms law  
 c) KVL and KCL                              d) KCL, KVL and ohms law
- 2) Superposition theorem is not applicable to network containing \_\_\_\_\_.  
 a) nonlinear elements                      b) dependent voltage source  
 c) dependent current source              d) transformers
- 3) An RC circuit has  $R = 2 \text{ ohm}$  and  $C = 4F$ . The time constant is \_\_\_\_\_.  
 a) 0.5 s                                              b) 2 s  
 c) 8 s                                                d) 1.5 s
- 4) Laplace transform of a unit ramp function is \_\_\_\_\_.  
 a) 1                                                      b) s  
 c) 1/s                                                d) 1/s<sup>2</sup>
- 5)  $L[e^{iat}]$  is \_\_\_\_\_.  
 a)  $1/(s + ia)$                                       b)  $1/s$   
 c)  $1/(s - ia)$                                       d) none of these
- 6) A capacitor does not allow sudden changes in \_\_\_\_\_.  
 a) currents                                              b) voltages  
 c) both a and b                                      d) none of above
- 7) Transients are presents in the circuit when the circuit is having \_\_\_\_\_.  
 a) R                                                      b) L  
 c) C                                                      d) either b) or c)
- 8) A 2-port network using z-parameter representation is said to be reciprocal if \_\_\_\_\_.  
 a)  $Z_{11} = Z_{22}$                                       b)  $Z_{12} = Z_{21}$   
 c)  $Z_{12} = -Z_{21}$                                       d)  $Z_{11}Z_{22} - Z_{12}Z_{21} = 1$

- 9) Which parameters are widely used in transmission line theory?
- a) Z parameters
  - b) ABCD parameters
  - c) Y parameters
  - d) h parameters
- 10) In an electrical circuit dual of inductance is \_\_\_\_\_.
- a) conductance
  - b) resistance
  - c) capacitance
  - d) susceptance
- 11) The number of independent loops for a network with n nodes and b branches is \_\_\_\_\_.
- a)  $n - 1$
  - b)  $b - n$
  - c)  $b - n + 1$
  - d) independent of the number of nodes
- 12) A practical current source consists of \_\_\_\_\_.
- a) An ideal current source in series with a resistance
  - b) An ideal current source in parallel with a resistance
  - c) Both are correct
  - d) None of the above
- 13) In Norton's theorem, to find  $Z_N$  \_\_\_\_\_.
- a) All independent current sources are short circuited and independent voltage sources are open circuited
  - b) All independent voltage and current sources are open circuited
  - c) All independent voltage and current sources are short circuited
  - d) All independent voltage sources are short circuited and independent current sources are open circuited
- 14) 3-ohm resistors are connected to form a triangle. What is the resistance between any two of the corners?
- a)  $\frac{3}{4}$  ohm
  - b) 3 ohm
  - c) 2 ohm
  - d)  $\frac{4}{3}$  ohm

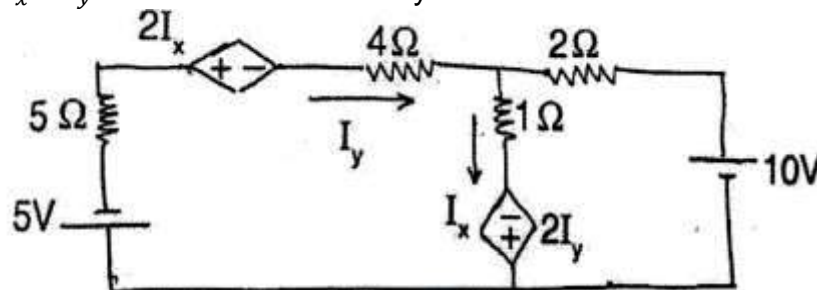
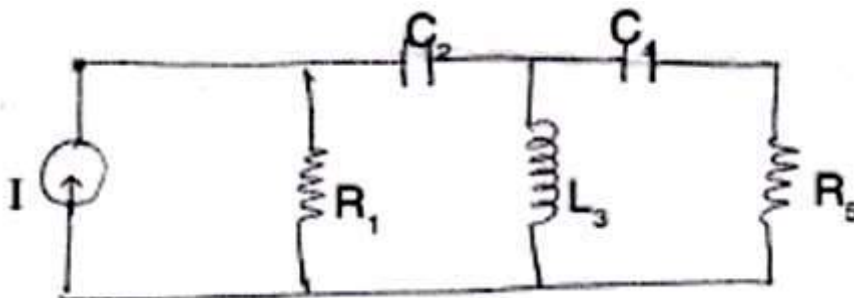
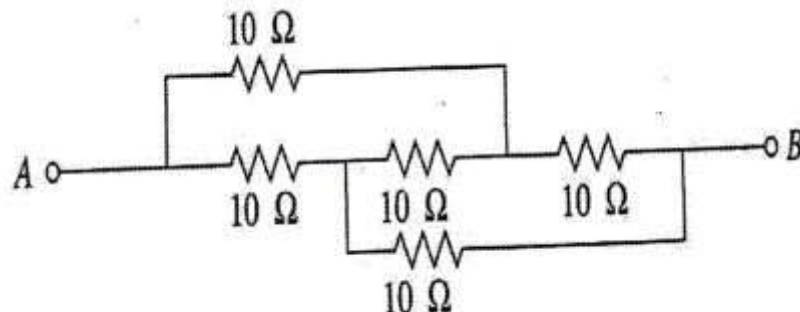
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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Network Analysis**

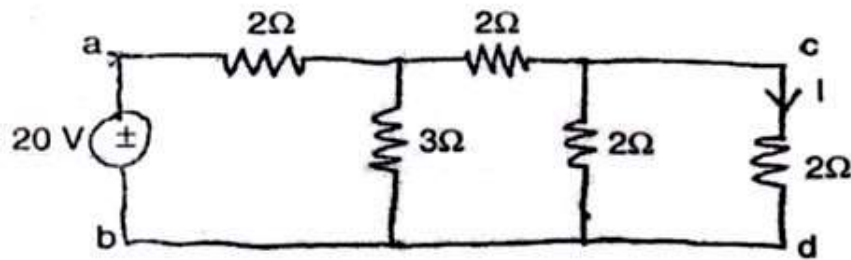
Day & Date: Friday, 10-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.

**Section – I****Q.2 Answer the following questions. (Any Four)****16****a)** Find the  $I_x$  &  $I_y$  for the circuit shown by mesh method.**b)** Draw the dual of the network.**c)** Derive the condition for maximum power transfer.**d)** Find the Equivalent Resistance between terminal A&B.

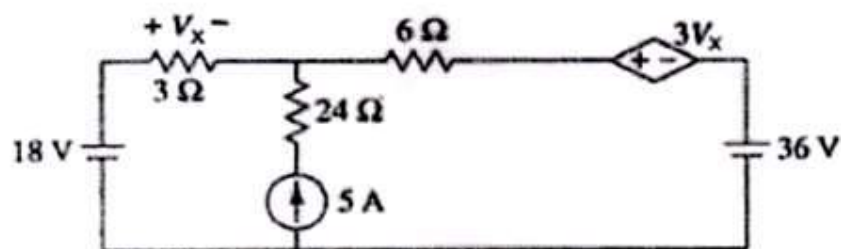
- e) Verify the Reciprocity theorem for the network shown below.



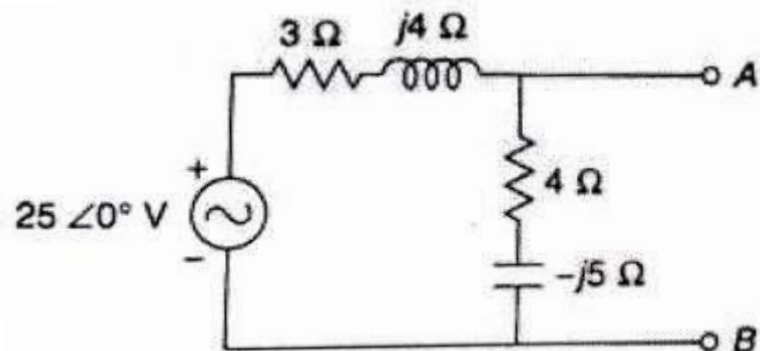
**Q.3 Answer the following questions. (Any Two)**

12

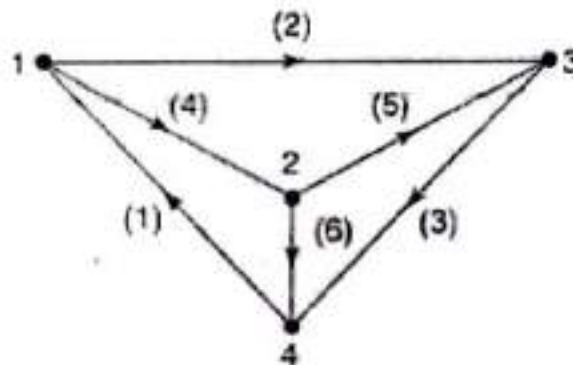
- a) Find the voltage  $V_x$  by Superposition principle.



- b) Find Norton's equivalent network for the circuit shown.



- c) The graph of a network shown in fig. write  
 1) Incidence matrix  
 2) Tie set matrix  
 3) Cut set matrix

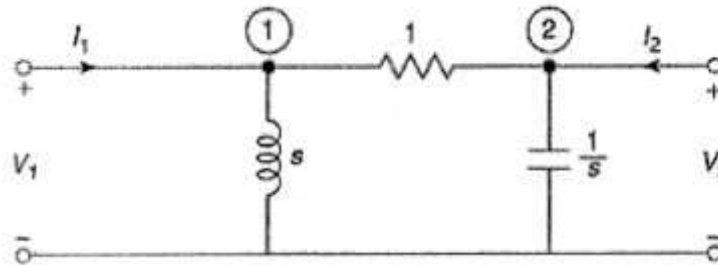
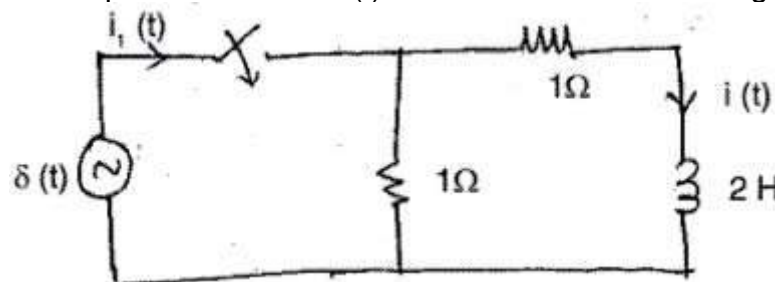
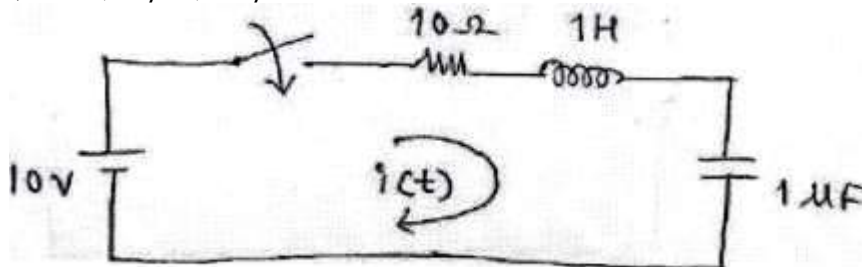


## Section – II

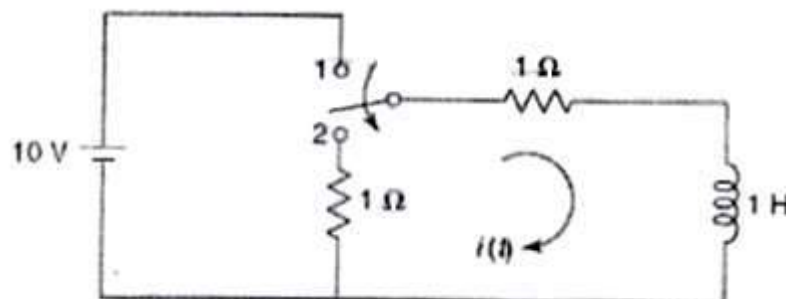
Q.4 Answer the following questions. (Any Four)

16

a) Determine transmission parameters for the given network.

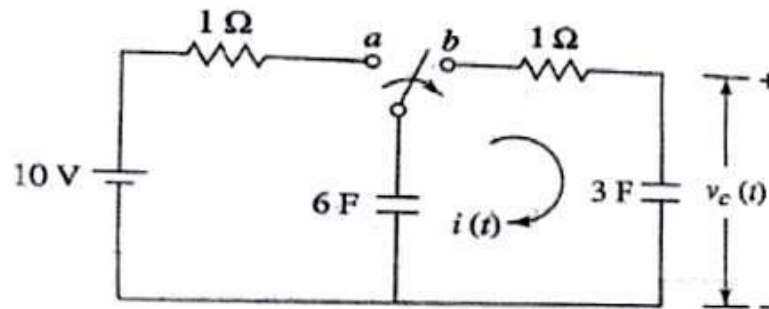
b) Find impulse response of current  $i(t)$  in the network shown in fig.c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find  $i$ ,  $di/dt$ ,  $d^2i/dt^2$  at  $t = 0 +$ .

d) Derive ABCD parameter in terms of Y-parameter.

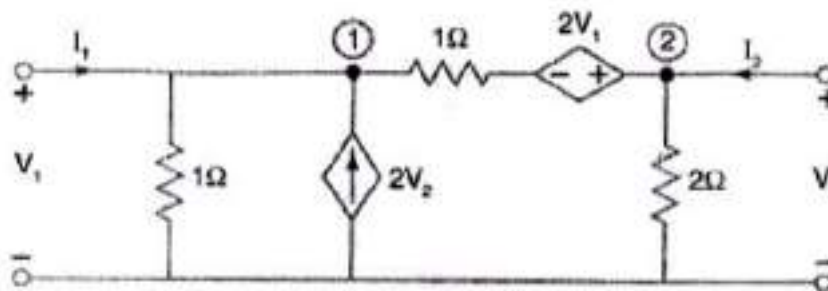
e) In the network shown in fig. the switch is moved from 1 to 2 at  $t = 0$ . Steady state condition having reached in position 1. Determine  $i(t)$  for  $t > 0$  using Laplace transforms.

**Q.5 Answer the following questions. (Any Two)**

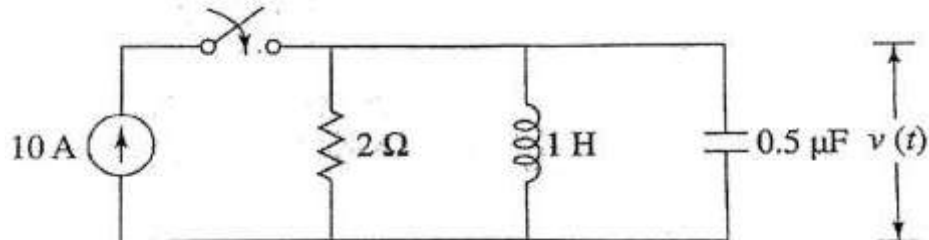
- a) In the network of fig. the switch is moved from a to b at  $t = 0$ . Determine  $i(t)$  and  $V_c(t)$  using Laplace transforms.



- b) Find Y and Z-Parameters of the network shown in Fig.



- c) For the Network shown in Fig. Switch is closed at  $t = 0$ , determine  $v$ ,  $dv/dt$  and  $d^2v/dt^2$  at  $t = 0 +$ .



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Set **P**

**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In solving simultaneous linear equation which of the following method is iterative?
 

|                  |                 |
|------------------|-----------------|
| a) Factorisation | b) Jacobi       |
| c) Gauss-Seidel  | d) Both b and c |
- 2) Error in the Trapezoidal rule is of the order \_\_\_\_\_.
 

|          |          |
|----------|----------|
| a) $h^2$ | b) $h^3$ |
| c) $h^4$ | d) $h^5$ |
- 3) If  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  then Picard's first approximation is \_\_\_\_\_.
 

|                            |                            |
|----------------------------|----------------------------|
| a) $1 + x$                 | b) $x + \frac{x^3}{3}$     |
| c) $1 + x - \frac{x^3}{3}$ | d) $1 + x + \frac{x^3}{3}$ |
- 4) Romberg method is used to solve \_\_\_\_\_.
 

|                                    |                 |
|------------------------------------|-----------------|
| a) Ordinary differential equations | b) Integration  |
| c) Partial differential equations  | d) All of these |
- 5) The quantity K obtained by Runge-Kutta method of fourth order for differential equation  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  when  $h = 0.1$  is \_\_\_\_\_.
 

|        |         |
|--------|---------|
| a) 0.1 | b) 0    |
| c) 1   | d) 0.01 |
- 6) LU decomposition of matrix is possible only for \_\_\_\_\_.
 

|                      |                    |
|----------------------|--------------------|
| a) Invertible matrix | b) Singular matrix |
| c) Square matrix     | d) Ordered matrix  |
- 7) The order of convergence of Newton -Raphson method is \_\_\_\_\_.
 

|      |      |
|------|------|
| a) 3 | b) 2 |
| c) 1 | d) 0 |
- 8) If all eigen values are negative then the quadratic form  $X'AX$  is \_\_\_\_\_.
 

|                      |                      |
|----------------------|----------------------|
| a) Positive definite | b) Negative definite |
| c) Indefinite        | d) None              |



- Page 2 of 20

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of non-programmable calculator is allowed.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Three) 09**

- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  correct to three decimal places by Trapezoidal rule taking  $h = 0.25$ .
- Find the Positive root of the equation  $x = \cos x$  by Newton Raphson method.
- Find a double root of the equation  $x^3 - 5.4x^2 - 9.24x - 5.096 = 0$  given that it is near to  $x_0 = 1.5$ .
- Evaluate  $I = \int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's  $\frac{3}{8}$  th rule.
- Apply Runge-Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.1$  given that  $\frac{dy}{dx} = x + y$  and  $y(0) = 1$ .

**Q.3 Answer the following questions. (Any Three) 09**

- Solve the system by Gauss-Elimination method.  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve by Picard's method  $\frac{dy}{dx} = y - x^2$  and  $y(0) = 1$  up to third approximation Hence find the value of  $y(0.2)$ .
- Find an iterative formula for  $\sqrt{N}$  (where N is an Positive number) and hence find  $\sqrt{5}$ .
- Solve by Gauss-Seidel method.  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$
- Evaluate  $I = \int_{0.2}^{1.5} e^{-x^2} dx$  by Gaussian quadrature three-point formula.

**Q.4 Answer the following questions. (Any Two) 10**

- Apply factorisation method to solve the equations  
 $5x - 2y + z = 4, 7x + y - 5z = 8, 3x + 7y + 4z = 10$
- Evaluate  $I = \int_0^1 \frac{1}{1+x^2} dx$  using Romberg method, hence obtain an approximate value of  $\pi$ .
- Solve the differential equation  $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$ , for  $x = 0.3$ . Using fourth order Runge-Kutta method and initial values are  $x = 0, y = 0, z = 1$  up to second approximation.

## Section – II

**Q.5 Answer the following questions. (Any Three)**

09

- a) Determine the rank of matrix A.

$$A = \begin{bmatrix} 2 & 5 & -3 & -4 & 8 \\ 4 & 7 & -4 & -3 & 9 \\ 6 & 9 & -5 & 2 & 4 \\ 0 & -9 & 6 & 5 & -6 \end{bmatrix}$$

- b) Find the bases for the null space of the matrix A.

$$A = \begin{bmatrix} -3 & 6 & -1 & 1 & -7 \\ 1 & -2 & 2 & 3 & -1 \\ 2 & -4 & 5 & 8 & -4 \end{bmatrix}$$

- c) Compute quadratic form
- $X'AX$
- for
- $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$
- and
- $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form  $X'AX$ .

- d) Determine whether the vectors are dependent or independent.

$$v_1 = \begin{bmatrix} 0 \\ 0 \\ 2 \end{bmatrix} \quad v_2 = \begin{bmatrix} 0 \\ 5 \\ -8 \end{bmatrix} \quad v_3 = \begin{bmatrix} -3 \\ 4 \\ 1 \end{bmatrix}$$

- e) Assume that T is linear transformation. Find standard matrix of
- $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$
- defined by
- $T(e_1) = (1,3)$
- $T(e_2) = (4,-7)$
- $T(e_3) = (-5,4)$

**Q.6 Answer the following questions. (Any Three)**

09

- a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to

$$\text{produce the orthonormal set } u = \begin{bmatrix} -2 \\ 3 \\ 1 \\ 3 \\ 2 \\ 3 \end{bmatrix} \quad v = \begin{bmatrix} 1 \\ 3 \\ 2 \\ 3 \\ 0 \end{bmatrix}$$

- b) Show that
- $\{v_1, v_2, v_3\}$
- is orthonormal basis for
- $\mathbb{R}^3$
- where

$$v_1 = \begin{bmatrix} 3 \\ \sqrt{11} \\ 1 \\ \sqrt{11} \\ 1 \\ \sqrt{11} \end{bmatrix} \quad v_2 = \begin{bmatrix} -1 \\ \sqrt{6} \\ 2 \\ \sqrt{6} \\ 1 \\ \sqrt{6} \end{bmatrix} \quad v_3 = \begin{bmatrix} -1 \\ \sqrt{66} \\ -4 \\ \sqrt{66} \\ 7 \\ \sqrt{66} \end{bmatrix}$$

- c) Describe all solutions of
- $AX = B$
- where
- $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & -8 \end{bmatrix}$
- $b = \begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$

- d) Is
- $\begin{bmatrix} 4 \\ -3 \\ 1 \end{bmatrix}$
- an eigen vector of
- $\begin{bmatrix} 3 & 7 & 9 \\ -4 & -5 & 1 \\ 2 & 4 & 4 \end{bmatrix}$
- if so, Find Eigen Value.

- e) Let
- $A = \begin{bmatrix} -8 & -2 & -9 \\ 6 & 4 & 8 \\ 4 & 0 & 4 \end{bmatrix}$
- and
- $W = \begin{bmatrix} 2 \\ 1 \\ -2 \end{bmatrix}$

Is W is in NulA?

Is W is in ColA?

**Q.7 Answer the following questions. (Any Two)**

- a) Find the numerically largest eigen values of A by Power method.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad X_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

- b) Orthogonally diagonalize the matrix A.

$$A = \begin{bmatrix} 3 & -2 & 4 \\ -2 & 6 & 2 \\ 4 & 2 & 3 \end{bmatrix}$$

- c) Find the dimension of NulA & ColA of matrix A where.

$$A = \begin{bmatrix} 1 & 2 & -4 & 3 & 3 \\ 5 & 10 & -9 & -7 & 8 \\ 4 & 8 & -9 & -2 & 7 \\ -2 & -4 & 5 & 0 & 6 \end{bmatrix}$$

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) If all eigen values are negative then the quadratic form  $X'AX$  is \_\_\_\_\_.  
 a) Positive definite                      b) Negative definite  
 c) Indefinite                                d) None
- 2)  $\|v\| = \sqrt{v \cdot v}$   
 a) True                                              b) False
- 3) If  $u = \begin{bmatrix} 7 \\ 1 \end{bmatrix}$ ,  $v = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$  then  $\|u - v\|$   
 a)  $\sqrt{7}$                                               b)  $\sqrt{17}$   
 c)  $\sqrt{71}$                                               d)  $\sqrt{70}$
- 4) -2 is the eigen values of A where  $A = \begin{bmatrix} 2 & 4 & 3 \\ -4 & -6 & -3 \\ 3 & 3 & 1 \end{bmatrix}$   
 a) True                                              b) False
- 5) Let A be an  $n \times n$  invertible matrix then which of the following is not true \_\_\_\_\_.  
 a) The columns of A forms a basis of  $R^n$   
 b) The rows of A forms a basis of  $R^n$   
 c) Rank A = n  
 d)  $\text{Nul } A \neq \{0\}$
- 6) If a system of equations has no free variables then it has \_\_\_\_\_.  
 a) Unique solution                              b) No solution  
 c) Infinite solution                              d) None
- 7) Power method is used to find \_\_\_\_\_.  
 a) Smallest eigen values                      b) Zero Eigen values  
 c) Largest eigen values                      d) None
- 8) In solving simultaneous linear equation which of the following method is iterative?  
 a) Factorisation                                      b) Jacobi  
 c) Gauss-Seidel                                      d) Both b and c



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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of non-programmable calculator is allowed.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Three)**

**09**

- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  correct to three decimal places by Trapezoidal rule taking  $h = 0.25$ .
- Find the Positive root of the equation  $x = \cos x$  by Newton Raphson method.
- Find a double root of the equation  $x^3 - 5.4x^2 - 9.24x - 5.096 = 0$  given that it is near to  $x_0 = 1.5$ .
- Evaluate  $I = \int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's  $\frac{3}{8}$  th rule.
- Apply Runge-Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.1$  given that  $\frac{dy}{dx} = x + y$  and  $y(0) = 1$ .

**Q.3 Answer the following questions. (Any Three)**

**09**

- Solve the system by Gauss-Elimination method.  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve by Picard's method  $\frac{dy}{dx} = y - x^2$  and  $y(0) = 1$  up to third approximation Hence find the value of  $y(0.2)$ .
- Find an iterative formula for  $\sqrt{N}$  (where N is an Positive number) and hence find  $\sqrt{5}$ .
- Solve by Gauss-Seidel method.  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$
- Evaluate  $I = \int_{0.2}^{1.5} e^{-x^2} dx$  by Gaussian quadrature three-point formula.

**Q.4 Answer the following questions. (Any Two)**

**10**

- Apply factorisation method to solve the equations  
 $5x - 2y + z = 4, 7x + y - 5z = 8, 3x + 7y + 4z = 10$
- Evaluate  $I = \int_0^1 \frac{1}{1+x^2} dx$  using Romberg method, hence obtain an approximate value of  $\pi$ .
- Solve the differential equation  $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$ , for  $x = 0.3$ . Using fourth order Runge-Kutta method and initial values are  $x = 0, y = 0, z = 1$  up to second approximation.

## Section – II

**Q.5 Answer the following questions. (Any Three)**

09

- a) Determine the rank of matrix A.

$$A = \begin{bmatrix} 2 & 5 & -3 & -4 & 8 \\ 4 & 7 & -4 & -3 & 9 \\ 6 & 9 & -5 & 2 & 4 \\ 0 & -9 & 6 & 5 & -6 \end{bmatrix}$$

- b) Find the bases for the null space of the matrix A.

$$A = \begin{bmatrix} -3 & 6 & -1 & 1 & -7 \\ 1 & -2 & 2 & 3 & -1 \\ 2 & -4 & 5 & 8 & -4 \end{bmatrix}$$

- c) Compute quadratic form
- $X'AX$
- for
- $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$
- and
- $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form  $X'AX$ .

- d) Determine whether the vectors are dependent or independent.

$$v_1 = \begin{bmatrix} 0 \\ 0 \\ 2 \end{bmatrix} \quad v_2 = \begin{bmatrix} 0 \\ 5 \\ -8 \end{bmatrix} \quad v_3 = \begin{bmatrix} -3 \\ 4 \\ 1 \end{bmatrix}$$

- e) Assume that T is linear transformation. Find standard matrix of
- $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$
- defined by
- $T(e_1) = (1,3)$
- $T(e_2) = (4,-7)$
- $T(e_3) = (-5,4)$

**Q.6 Answer the following questions. (Any Three)**

09

- a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to

$$\text{produce the orthonormal set } u = \begin{bmatrix} -2 \\ 3 \\ 1 \\ 3 \\ 2 \\ 3 \end{bmatrix} \quad v = \begin{bmatrix} 1 \\ 3 \\ 2 \\ 3 \\ 0 \end{bmatrix}$$

- b) Show that
- $\{v_1, v_2, v_3\}$
- is orthonormal basis for
- $\mathbb{R}^3$
- where

$$v_1 = \begin{bmatrix} 3 \\ \sqrt{11} \\ 1 \\ \sqrt{11} \\ 1 \\ \sqrt{11} \end{bmatrix} \quad v_2 = \begin{bmatrix} -1 \\ \sqrt{6} \\ 2 \\ \sqrt{6} \\ 1 \\ \sqrt{6} \end{bmatrix} \quad v_3 = \begin{bmatrix} -1 \\ \sqrt{66} \\ -4 \\ \sqrt{66} \\ 7 \\ \sqrt{66} \end{bmatrix}$$

- c) Describe all solutions of
- $AX = B$
- where
- $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & -8 \end{bmatrix}$
- $b = \begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$

- d) Is
- $\begin{bmatrix} 4 \\ -3 \\ 1 \end{bmatrix}$
- an eigen vector of
- $\begin{bmatrix} 3 & 7 & 9 \\ -4 & -5 & 1 \\ 2 & 4 & 4 \end{bmatrix}$
- if so, Find Eigen Value.

- e) Let
- $A = \begin{bmatrix} -8 & -2 & -9 \\ 6 & 4 & 8 \\ 4 & 0 & 4 \end{bmatrix}$
- and
- $W = \begin{bmatrix} 2 \\ 1 \\ -2 \end{bmatrix}$

Is W is in NulA?

Is W is in ColA?



**Q.7 Answer the following questions. (Any Two)**

- a) Find the numerically largest eigen values of A by Power method.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad X_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

- b) Orthogonally diagonalize the matrix A.

$$A = \begin{bmatrix} 3 & -2 & 4 \\ -2 & 6 & 2 \\ 4 & 2 & 3 \end{bmatrix}$$

- c) Find the dimension of NulA & ColA of matrix A where.

$$A = \begin{bmatrix} 1 & 2 & -4 & 3 & 3 \\ 5 & 10 & -9 & -7 & 8 \\ 4 & 8 & -9 & -2 & 7 \\ -2 & -4 & 5 & 0 & 6 \end{bmatrix}$$

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) -2 is the eigen values of A where  $A = \begin{bmatrix} 2 & 4 & 3 \\ -4 & -6 & -3 \\ 3 & 3 & 1 \end{bmatrix}$ 
  - a) True
  - b) False
- 2) Let A be an  $n \times n$  invertible matrix then which of the following is not true \_\_\_\_\_.
  - a) The columns of A forms a basis of  $R^n$
  - b) The rows of A forms a basis of  $R^n$
  - c) Rank A = n
  - d) Nul A  $\neq \{0\}$
- 3) If a system of equations has no free variables then it has \_\_\_\_\_.
  - a) Unique solution
  - b) No solution
  - c) Infinite solution
  - d) None
- 4) Power method is used to find \_\_\_\_\_.
  - a) Smallest eigen values
  - b) Zero Eigen values
  - c) Largest eigen values
  - d) None
- 5) In solving simultaneous linear equation which of the following method is iterative?
  - a) Factorisation
  - b) Jacobi
  - c) Gauss-Seidel
  - d) Both b and c
- 6) Error in the Trapezoidal rule is of the order \_\_\_\_\_.
  - a)  $h^2$
  - b)  $h^3$
  - c)  $h^4$
  - d)  $h^5$
- 7) If  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  then Picard's first approximation is \_\_\_\_\_.
  - a)  $1 + x$
  - b)  $x + \frac{x^3}{3}$
  - c)  $1 + x - \frac{x^3}{3}$
  - d)  $1 + x + \frac{x^3}{3}$

- 8) Romberg method is used to solve \_\_\_\_\_.  
a) Ordinary differential equations    b) Integration  
c) Partial differential equations    d) All of these
- 9) The quantity K obtained by Runge-Kutta method of fourth order for differential equation  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  when  $h = 0.1$  is \_\_\_\_\_.  
a) 0.1    b) 0  
c) 1    d) 0.01
- 10) LU decomposition of matrix is possible only for \_\_\_\_\_.  
a) Invertible matrix    b) Singular matrix  
c) Square matrix    d) Ordered matrix
- 11) The order of convergence of Newton -Raphson method is \_\_\_\_\_.  
a) 3    b) 2  
c) 1    d) 0
- 12) If all eigen values are negative then the quadratic form  $X'AX$  is \_\_\_\_\_.  
a) Positive definite    b) Negative definite  
c) Indefinite    d) None
- 13)  $\|v\| = \sqrt{v \cdot v}$   
a) True    b) False
- 14) If  $u = \begin{bmatrix} 7 \\ 1 \end{bmatrix}$ ,  $v = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$  then  $\|u - v\|$   
a)  $\sqrt{7}$     b)  $\sqrt{17}$   
c)  $\sqrt{71}$     d)  $\sqrt{70}$

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of non-programmable calculator is allowed.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Three)**

**09**

- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  correct to three decimal places by Trapezoidal rule taking  $h = 0.25$ .
- Find the Positive root of the equation  $x = \cos x$  by Newton Raphson method.
- Find a double root of the equation  $x^3 - 5.4x^2 - 9.24x - 5.096 = 0$  given that it is near to  $x_0 = 1.5$ .
- Evaluate  $I = \int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's  $\frac{3}{8}$  th rule.
- Apply Runge-Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.1$  given that  $\frac{dy}{dx} = x + y$  and  $y(0) = 1$ .

**Q.3 Answer the following questions. (Any Three)**

**09**

- Solve the system by Gauss-Elimination method.  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve by Picard's method  $\frac{dy}{dx} = y - x^2$  and  $y(0) = 1$  up to third approximation Hence find the value of  $y(0.2)$ .
- Find an iterative formula for  $\sqrt{N}$  (where N is an Positive number) and hence find  $\sqrt{5}$ .
- Solve by Gauss-Seidel method.  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$
- Evaluate  $I = \int_{0.2}^{1.5} e^{-x^2} dx$  by Gaussian quadrature three-point formula.

**Q.4 Answer the following questions. (Any Two)**

**10**

- Apply factorisation method to solve the equations  
 $5x - 2y + z = 4, 7x + y - 5z = 8, 3x + 7y + 4z = 10$
- Evaluate  $I = \int_0^1 \frac{1}{1+x^2} dx$  using Romberg method, hence obtain an approximate value of  $\pi$ .
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## Section – II

## Q.5 Answer the following questions. (Any Three)

09

- a) Determine the rank of matrix A.

$$A = \begin{bmatrix} 2 & 5 & -3 & -4 & 8 \\ 4 & 7 & -4 & -3 & 9 \\ 6 & 9 & -5 & 2 & 4 \\ 0 & -9 & 6 & 5 & -6 \end{bmatrix}$$

- b) Find the bases for the null space of the matrix A.

$$A = \begin{bmatrix} -3 & 6 & -1 & 1 & -7 \\ 1 & -2 & 2 & 3 & -1 \\ 2 & -4 & 5 & 8 & -4 \end{bmatrix}$$

- c) Compute quadratic form
- $X'AX$
- for
- $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$
- and
- $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form  $X'AX$ .

- d) Determine whether the vectors are dependent or independent.

$$v_1 = \begin{bmatrix} 0 \\ 0 \\ 2 \end{bmatrix} \quad v_2 = \begin{bmatrix} 0 \\ 5 \\ -8 \end{bmatrix} \quad v_3 = \begin{bmatrix} -3 \\ 4 \\ 1 \end{bmatrix}$$

- e) Assume that T is linear transformation. Find standard matrix of
- $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$
- defined by
- $T(e_1) = (1,3)$
- $T(e_2) = (4,-7)$
- $T(e_3) = (-5,4)$

## Q.6 Answer the following questions. (Any Three)

09

- a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to

$$\text{produce the orthonormal set } u = \begin{bmatrix} -2 \\ 3 \\ 1 \\ 3 \\ 2 \\ 3 \end{bmatrix} \quad v = \begin{bmatrix} 1 \\ 3 \\ 2 \\ 3 \\ 0 \end{bmatrix}$$

- b) Show that
- $\{v_1, v_2, v_3\}$
- is orthonormal basis for
- $\mathbb{R}^3$
- where

$$v_1 = \begin{bmatrix} 3 \\ \sqrt{11} \\ 1 \\ \sqrt{11} \\ 1 \\ \sqrt{11} \end{bmatrix} \quad v_2 = \begin{bmatrix} -1 \\ \sqrt{6} \\ 2 \\ \sqrt{6} \\ 1 \\ \sqrt{6} \end{bmatrix} \quad v_3 = \begin{bmatrix} -1 \\ \sqrt{66} \\ -4 \\ \sqrt{66} \\ 7 \\ \sqrt{66} \end{bmatrix}$$

- c) Describe all solutions of
- $AX = B$
- where
- $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & -8 \end{bmatrix}$
- $b = \begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$

- d) Is
- $\begin{bmatrix} 4 \\ -3 \\ 1 \end{bmatrix}$
- an eigen vector of
- $\begin{bmatrix} 3 & 7 & 9 \\ -4 & -5 & 1 \\ 2 & 4 & 4 \end{bmatrix}$
- if so, Find Eigen Value.

- e) Let
- $A = \begin{bmatrix} -8 & -2 & -9 \\ 6 & 4 & 8 \\ 4 & 0 & 4 \end{bmatrix}$
- and
- $W = \begin{bmatrix} 2 \\ 1 \\ -2 \end{bmatrix}$

Is W is in NulA?

Is W is in ColA?

**Q.7 Answer the following questions. (Any Two)**

- a) Find the numerically largest eigen values of A by Power method.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad X_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

- b) Orthogonally diagonalize the matrix A.

$$A = \begin{bmatrix} 3 & -2 & 4 \\ -2 & 6 & 2 \\ 4 & 2 & 3 \end{bmatrix}$$

- c) Find the dimension of NulA & ColA of matrix A where.

$$A = \begin{bmatrix} 1 & 2 & -4 & 3 & 3 \\ 5 & 10 & -9 & -7 & 8 \\ 4 & 8 & -9 & -2 & 7 \\ -2 & -4 & 5 & 0 & 6 \end{bmatrix}$$

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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.  
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.  
 3) Figures to the right indicate full marks  
 4) Use of non-programmable calculator is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) LU decomposition of matrix is possible only for \_\_\_\_\_.  
 a) Invertible matrix                      b) Singular matrix  
 c) Square matrix                          d) Ordered matrix
- 2) The order of convergence of Newton -Raphson method is \_\_\_\_\_.  
 a) 3                                              b) 2  
 c) 1                                              d) 0
- 3) If all eigen values are negative then the quadratic form  $X'AX$  is \_\_\_\_\_.  
 a) Positive definite                      b) Negative definite  
 c) Indefinite                                d) None
- 4)  $\|v\| = \sqrt{v \cdot v}$   
 a) True                                          b) False
- 5) If  $u = \begin{bmatrix} 7 \\ 1 \end{bmatrix}$ ,  $v = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$  then  $\|u - v\|$   
 a)  $\sqrt{7}$                                           b)  $\sqrt{17}$   
 c)  $\sqrt{71}$                                           d)  $\sqrt{70}$
- 6) -2 is the eigen values of A where  $A = \begin{bmatrix} 2 & 4 & 3 \\ -4 & -6 & -3 \\ 3 & 3 & 1 \end{bmatrix}$   
 a) True                                          b) False
- 7) Let A be an n x n invertible matrix then which of the following is not true \_\_\_\_\_.  
 a) The columns of A forms a basis of  $R^n$   
 b) The rows of A forms a basis of  $R^n$   
 c) Rank A = n  
 d)  $\text{Nul } A \neq \{0\}$
- 8) If a system of equations has no free variables then it has \_\_\_\_\_.  
 a) Unique solution                      b) No solution  
 c) Infinite solution                      d) None

- 9) Power method is used to find \_\_\_\_\_.  
a) Smallest eigen values      b) Zero Eigen values  
c) Largest eigen values      d) None
- 10) In solving simultaneous linear equation which of the following method is iterative?  
a) Factorisation      b) Jacobi  
c) Gauss-Seidel      d) Both b and c
- 11) Error in the Trapezoidal rule is of the order \_\_\_\_\_.  
a)  $h^2$       b)  $h^3$   
c)  $h^4$       d)  $h^5$
- 12) If  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  then Picard's first approximation is \_\_\_\_\_.  
a)  $1 + x$       b)  $x + \frac{x^3}{3}$   
c)  $1 + x - \frac{x^3}{3}$       d)  $1 + x + \frac{x^3}{3}$
- 13) Romberg method is used to solve \_\_\_\_\_.  
a) Ordinary differential equations      b) Integration  
c) Partial differential equations      d) All of these
- 14) The quantity K obtained by Runge-Kutta method of fourth order for differential equation  $\frac{dy}{dx} = x^2 + y^2$  and  $y(0) = 1$  when  $h = 0.1$  is \_\_\_\_\_.  
a) 0.1      b) 0  
c) 1      d) 0.01



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**S. Y. (B.Tech.) (Sem - II) (Old) (CBCS) Examination: Oct/Nov-2022**  
**ELECTRICAL ENGINEERING**  
**Numerical Methods and Linear Algebra**

Day & Date: Tuesday, 14-03-2023  
 Time: 02:00 PM To 05:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of non-programmable calculator is allowed.  
 3) Figures to the right indicate full marks.

**Section – I**

**Q.2 Answer the following questions. (Any Three) 09**

- Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$  correct to three decimal places by Trapezoidal rule taking  $h = 0.25$ .
- Find the Positive root of the equation  $x = \cos x$  by Newton Raphson method.
- Find a double root of the equation  $x^3 - 5.4x^2 - 9.24x - 5.096 = 0$  given that it is near to  $x_0 = 1.5$ .
- Evaluate  $I = \int_0^1 \frac{x^2}{1+x^3} dx$  using Simpson's  $\frac{3}{8}$  th rule.
- Apply Runge-Kutta method of fourth order to find an approximate value of  $y$  when  $x = 0.1$  given that  $\frac{dy}{dx} = x + y$  and  $y(0) = 1$ .

**Q.3 Answer the following questions. (Any Three) 09**

- Solve the system by Gauss-Elimination method.  
 $x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$
- Solve by Picard's method  $\frac{dy}{dx} = y - x^2$  and  $y(0) = 1$  up to third approximation Hence find the value of  $y(0.2)$ .
- Find an iterative formula for  $\sqrt{N}$  (where N is an Positive number) and hence find  $\sqrt{5}$ .
- Solve by Gauss-Seidel method.  
 $10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$
- Evaluate  $I = \int_{0.2}^{1.5} e^{-x^2} dx$  by Gaussian quadrature three-point formula.

**Q.4 Answer the following questions. (Any Two) 10**

- Apply factorisation method to solve the equations  
 $5x - 2y + z = 4, 7x + y - 5z = 8, 3x + 7y + 4z = 10$
- Evaluate  $I = \int_0^1 \frac{1}{1+x^2} dx$  using Romberg method, hence obtain an approximate value of  $\pi$ .
- Solve the differential equation  $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$ , for  $x = 0.3$ . Using fourth order Runge-Kutta method and initial values are  $x = 0, y = 0, z = 1$  up to second approximation.

## Section – II

09

**Q.5 Answer the following questions. (Any Three)**

- a) Determine the rank of matrix A.

$$A = \begin{bmatrix} 2 & 5 & -3 & -4 & 8 \\ 4 & 7 & -4 & -3 & 9 \\ 6 & 9 & -5 & 2 & 4 \\ 0 & -9 & 6 & 5 & -6 \end{bmatrix}$$

- b) Find the bases for the null space of the matrix A.

$$A = \begin{bmatrix} -3 & 6 & -1 & 1 & -7 \\ 1 & -2 & 2 & 3 & -1 \\ 2 & -4 & 5 & 8 & -4 \end{bmatrix}$$

- c) Compute quadratic form
- $X'AX$
- for
- $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$
- and
- $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form  $X'AX$ .

- d) Determine whether the vectors are dependent or independent.

$$v_1 = \begin{bmatrix} 0 \\ 0 \\ 2 \end{bmatrix} \quad v_2 = \begin{bmatrix} 0 \\ 5 \\ -8 \end{bmatrix} \quad v_3 = \begin{bmatrix} -3 \\ 4 \\ 1 \end{bmatrix}$$

- e) Assume that T is linear transformation. Find standard matrix of
- $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$
- defined by
- $T(e_1) = (1,3)$
- $T(e_2) = (4,-7)$
- $T(e_3) = (-5,4)$

**Q.6 Answer the following questions. (Any Three)**

09

- a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to

$$\text{produce the orthonormal set } u = \begin{bmatrix} -2 \\ 3 \\ 1 \\ 3 \\ 2 \\ -3 \\ 3 \end{bmatrix} \quad v = \begin{bmatrix} 1 \\ 3 \\ 2 \\ 3 \\ 0 \end{bmatrix}$$

- b) Show that
- $\{v_1, v_2, v_3\}$
- is orthonormal basis for
- $\mathbb{R}^3$
- where

$$v_1 = \begin{bmatrix} 3 \\ \sqrt{11} \\ 1 \\ \sqrt{11} \\ 1 \\ \sqrt{11} \end{bmatrix} \quad v_2 = \begin{bmatrix} -1 \\ \sqrt{6} \\ 2 \\ \sqrt{6} \\ 1 \\ \sqrt{6} \end{bmatrix} \quad v_3 = \begin{bmatrix} -1 \\ \sqrt{66} \\ -4 \\ \sqrt{66} \\ 7 \\ \sqrt{66} \end{bmatrix}$$

- c) Describe all solutions of
- $AX = B$
- where
- $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & -8 \end{bmatrix}$
- $b = \begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$

- d) Is
- $\begin{bmatrix} 4 \\ -3 \\ 1 \end{bmatrix}$
- an eigen vector of
- $\begin{bmatrix} 3 & 7 & 9 \\ -4 & -5 & 1 \\ 2 & 4 & 4 \end{bmatrix}$
- if so, Find Eigen Value.

- e) Let
- $A = \begin{bmatrix} -8 & -2 & -9 \\ 6 & 4 & 8 \\ 4 & 0 & 4 \end{bmatrix}$
- and
- $W = \begin{bmatrix} 2 \\ 1 \\ -2 \end{bmatrix}$

Is W is in NulA?

Is W is in ColA?

**Q.7 Answer the following questions. (Any Two)**

- a) Find the numerically largest eigen values of A by Power method.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad X_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

- b) Orthogonally diagonalize the matrix A.

$$A = \begin{bmatrix} 3 & -2 & 4 \\ -2 & 6 & 2 \\ 4 & 2 & 3 \end{bmatrix}$$

- c) Find the dimension of NulA & ColA of matrix A where.

$$A = \begin{bmatrix} 1 & 2 & -4 & 3 & 3 \\ 5 & 10 & -9 & -7 & 8 \\ 4 & 8 & -9 & -2 & 7 \\ -2 & -4 & 5 & 0 & 6 \end{bmatrix}$$

|                 |  |                       |  |                              |  |                                       |  |
|-----------------|--|-----------------------|--|------------------------------|--|---------------------------------------|--|
| <b>Seat No.</b> |  | <b>Marks Obtained</b> |  | <b>Signature of Examiner</b> |  | <b>Signature of Junior Supervisor</b> |  |
|-----------------|--|-----------------------|--|------------------------------|--|---------------------------------------|--|

**F. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: Oct/Nov-2022**  
**Democracy, Elections, and Good Governance**

Day & Date: Saturday, 11-03-2023  
Time: 10:00 AM to 12:00 PM

Max. Marks: 50

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

**Answer**

**Q.1 Choose the correct alternatives from the options and rewrite the sentence.**

- 1) Indirect Democracy is also called as \_\_\_\_\_ democracy.

|                   |          |                      |
|-------------------|----------|----------------------|
| a) Representative | b) Royal | <input type="text"/> |
| c) Negative       | d) Old   |                      |
- 2) Direct democracy was started in \_\_\_\_\_ in 3 century B.C.

|           |            |                      |
|-----------|------------|----------------------|
| a) India  | b) England | <input type="text"/> |
| c) Athens | d) America |                      |
- 3) Democracy must be based on \_\_\_\_\_.

|                                      |                      |
|--------------------------------------|----------------------|
| a) One-party system                  | <input type="text"/> |
| b) choice from only the ruling party |                      |
| c) Free and fair election            |                      |
| d) none of these                     |                      |
- 4) Direct democracy is based on the direct, mediated and continuous participation of \_\_\_\_\_ in the functions of the government.

|             |                |                      |
|-------------|----------------|----------------------|
| a) Media    | b) Ministers   | <input type="text"/> |
| c) Citizens | d) Businessman |                      |
- 5) \_\_\_\_\_ are supreme authority in the Representative Democracy.

|            |            |                      |
|------------|------------|----------------------|
| a) Leaders | b) Parties | <input type="text"/> |
| c) People  | d) Kings   |                      |
- 6) Constitutional government means government by \_\_\_\_\_.

|             |        |                      |
|-------------|--------|----------------------|
| a) law      | b) men | <input type="text"/> |
| c) dictator | d) mob |                      |
- 7) In India Dr. B. R. Ambedkar strongly advocated for \_\_\_\_\_ democracy.

|              |                  |                      |
|--------------|------------------|----------------------|
| a) political | b) social        | <input type="text"/> |
| c) Limited   | d) none of these |                      |
- 8) How does democracy allow us to correct its own mistakes?

|                                                                          |                      |
|--------------------------------------------------------------------------|----------------------|
| a) Mistakes are hidden and cannot be corrected                           | <input type="text"/> |
| b) The rulers can be changed                                             |                      |
| c) Re-electing the same government to enable it to correct its mistakes. |                      |
| d) None of these                                                         |                      |

- 9) In which of these cases can't democracy provide a complete solution?
- a) Removing poverty completely  
b) Providing education to all  
c) Giving jobs to all  
d) All of these
- 10) How many fundamental rights are included in the Indian constitution?
- a) four  
b) six  
c) two  
d) ten
- 11) How many percent of seats in the local bodies are reserved for Women in India?
- a) 33%  
b) 15%  
c) 70%  
d) 27%
- 12) Dalits, Tribals, Casual workers, Fisher folks are considered as \_\_\_\_\_ sections in India.
- a) advanced  
b) marginalized  
c) ruling  
d) none of these
- 13) In representative democracy the process of \_\_\_\_\_ links the government and the people
- a) judiciary  
b) election  
c) Dictatorship  
d) Corruption
- 14) Public Accountability means the representative must remain \_\_\_\_\_ to the people.
- a) opposite  
b) answerable  
c) Irresponsible  
d) none of these
- 15) Drawbacks of democracy are \_\_\_\_\_.
- a) Corruption and hypocrisy  
b) Politicians fighting among themselves  
c) Instability and delays  
d) all of these
- 16) Studies on political and social inequalities in democracy show that
- a) Democracy deters development  
b) Dictatorship is better than democracy  
c) Inequalities do not exist in dictatorship  
d) Inequalities exist in democracies
- 17) At the national level, Indians directly elect their representatives to \_\_\_\_\_.
- a) Loksabha  
b) Rajysabha  
c) Vidhansabha  
d) Vidhan Parishad
- 18) Loksabha has \_\_\_\_\_ members which are directly elected by the people.
- a) 250  
b) 543  
c) 500  
d) 750
- 19) Members of Rajyasabha are \_\_\_\_\_ elected.
- a) Directly  
b) Indirectly  
c) Privately  
d) None of these

- Page 3 of 5

- Page 4 of 5

- 41) Which of the following statements is true?
- a) In a democracy, the majority and minority opinions are not permanent.
  - b) In a democracy, it is also necessary that rule by the majority does not become rule by the majority community in terms of religion, race or linguistic group.
  - c) Democracy remains democracy only as long as every citizen has a chance of being in the majority at same point in time.
  - d) All of these
- 42) \_\_\_\_\_ stands much superior to any other form of government in promoting dignity and freedom of the individual.
- a) Theocracy
  - b) Oligarchy
  - c) Dictatorship
  - d) Democracy
- 43) Governing by using science & technology is known as \_\_\_\_\_.
- a) E-Governance
  - b) Private Administration
  - c) Scientific Administration
  - d) None of The Above
- 44) MGNREGA Policy Guarantees \_\_\_\_\_.
- a) Education
  - b) Employment
  - c) Voting
  - d) None of The Above
- 45) \_\_\_\_\_ Commission was formed for eradication of corruption.
- a) Central Vigilance
  - b) Election
  - c) MGNREGA
  - d) Finance
- 46) In representative democracy, the process of \_\_\_\_\_ links the government and the people.
- a) Judiciary
  - b) Election
  - c) Dictatorship
  - d) Corruption
- 47) Dalits, Tribals, Casual workers, Fisher folks are considered as \_\_\_\_\_ sections in India.
- a) Advanced
  - b) Marginalized
  - c) Ruling
  - d) None of these
- 48) How many percent of seats in the local bodies are reserved for women in India?
- a) 33%
  - b) 15%
  - c) 70%
  - d) 27%
- 49) In a democracy, a citizen who wants to know if a decision was taken through the correct procedures can find this out. This is the hallmark of \_\_\_\_\_.
- a) Transparency
  - b) Lack of transparency
  - c) Opacity
  - d) Ambiguity
- 50) Accountability to the citizens is the most basic outcome of \_\_\_\_\_.
- a) Theocracy
  - b) Autocracy
  - c) Democracy
  - d) Socialism



|                 |  |
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| <b>Seat No.</b> |  |
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Day & Date: Friday, 24-03-2023  
Time: 03:00 PM To 05:30 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer book. Page no 03 (Starting page of the Answer Book). Each Question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

3) Figures to the right indicates full marks

**Duration: 30 Minutes**

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

14

- 1) Pollutants of SO<sub>2</sub> are naturally found in \_\_\_\_\_.  
a) Earth quake                      b) Water  
c) Land                                d) Volcano
- 2) Conflict of \_\_\_\_\_ was done in Uttar Pradesh.  
a) Tehari Dam                      b) Chipko Movement  
c) Ocean protection                d) Air pollution
- 3) \_\_\_\_\_ is not considered as renewable energy resource.  
a) Solar Energy                      b) Hydroelectric energy  
c) Oceanic energy                  d) Petroleum
- 4) Kalhari is a example of \_\_\_\_\_ ecosystem.  
a) Forest                              b) Marine  
c) Desert                              d) Grassland
- 5) The term environment means \_\_\_\_\_.  
a) Area                                b) Land  
c) Surrounding Area                d) Region
- 6) The term "Ecosystem" was first introduced by \_\_\_\_\_.  
a) R. Carson                         b) Aurthur Tansley  
c) E. P. Odum                        d) A. Charls
- 7) In India Forest Conservation Act was passed in year \_\_\_\_\_.  
a) 1980                                b) 1982  
c) 1984                                d) 1986
- 8) Conservation of biodiversity in their natural habitat is called \_\_\_\_\_.  
a) Ex-situ conservation              b) In-situ conservation  
c) Protection                        d) Conservation
- 9) The word "Environment' is derived from \_\_\_\_\_ language.  
a) French                              b) Roman  
c) Latin                                d) Greek
- 10) The animal which depend on fully vegetation for their food is known as \_\_\_\_\_.  
a) Primary                              b) Secondary  
c) Tertiary                              d) Quaternary

- 11)** Sound intensity is measured in \_\_\_\_\_ unit.  
a) Millimeter  
b) Celsius  
c) Milibar  
d) Decible
- 12)** In India \_\_\_\_\_ regions are rich in Biodiversity.  
a) Two  
b) Three  
c) Four  
d) Five
- 13)** \_\_\_\_\_ is a non-renewable resource.  
a) Wind energy  
b) Solar energy  
c) Coal  
d) Molecular energy
- 14)** World Environment Day' is celebrated on \_\_\_\_\_.  
a) 05 May  
b) 05 June  
c) 05 March  
d) 05 April

|                 |  |
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| <b>Seat No.</b> |  |
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**Set****P**

**S. Y. (B.Tech.) (Sem - IV) (New) (CBCS) Examination: Oct/Nov-2022**  
**Environmental Studies**

Day &amp; Date: Friday, 24-03-2023

Max. Marks: 56

Time: 03:00 PM To 05:30 PM

**Instructions:** 1) All Questions are compulsory.  
2) Figures to the right indicate full marks.

- Q.2 Answer the following question. 14**  
a) Marine Ecosystem.  
b) Causes of Deforestation.
- Q.3 Answer the following question. 14**  
a) Causes of Air Pollution.  
b) Water Pollution (Prevention and Control) Act
- Q.4 Answer any one of the following question. 14**  
a) Explain the India as a Mega biodiversity Region.  
**OR**  
b) Explain the structure and function of Ecosystem.
- Q.5 Answer any one of the following question. 14**  
a) Explain the causes and effects of Noise pollution.  
**OR**  
b) Define Environmental Studies? Describe the nature and scope of environmental Studies.